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ABSTRACT

Participants in a National Seminar on the Diffusion of New Instructional Materials and Practices included scientists and educators in the natural and social sciences and mathematics from universities, curriculum projects, and school districts throughout the United States. This document is the first of a series of working papers which were developed during the conference. Two questions are considered: Are there characteristics of particular subject matters that make products which are based on them more or less likely to be adopted? Are there characteristics of developers that tend to inhibit or encourage use of their ideas and products. Responses of conference participants to these queries are collected and published in this paper. Related documents are SO 006 339 through SO 006 344. (SHM)

# NATIONAL SEMINAR ON THE DIFFUSION OF NEW INSTRUCTIONAL MATERIALS AND PRACTICES

*Wingspread*

*June 1, 2, 3, 1973*

1.0 ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

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2.0 ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?



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1.0 Are there characteristics of particular subject matters that make products which are based on them more or less likely to be adopted?

There are probably not inherent characteristics of particular subject matters that would make them likely to be adopted. Rather, it is how someone or somebody in some kind of authority position communicates the importance of particular subject matters.

Characteristics of subject matters might be classified into three categories. They are: tradition, salvation, and fad. Each of these categories has been stated by someone or some group to be important for some reason. Under tradition, in the social studies, I would consider the subjects of history, government, civics, and geography to be the primary subject matters. These subject matters have been identified as something that children "need to know". Therefore the subject matters are included in the curriculum. Under salvation, I would use the example of economics. The discipline of economics in many cases, has been cracked up to be a discipline which will "save the person" or "save the society". Thus, if someone is convinced of the salvation aspects of economics, particular products which purport to teach economics may be adopted. Under fad, I would list such subject matters as religion, career education, drug education, sex education. In the last few years these subjects have been considered important. Thus products containing these kinds of subjects are adopted.

2.0 Are there characteristics of developers that tend to inhibit or encourage use of their ideas and products?

I identified two general kinds of characteristics of developers, one which appears to encourage the use of their ideas, the other which appears to inhibit the use of their ideas. The first is the "good guy" characteristic. Some traits that come to mind under the "good guy" characteristic are charm, verve, warmth, and wit. Lawrence Senesh, the author of the Our Working World elementary curriculum series, seems to fall mostly into this category. Through projection of the "good guy" image users are encouraged to at least give careful consideration to the product of a developer like Senesh. The other general characteristic is what I would call the "ivory tower" characteristic. Some traits that come to mind in this category are sophisticated, complex, and philosophical. In general, it appears that this kind of image may intend to inhibit the careful consideration of products that are projected in this way. One case in point is the presentations of Robert L. Darcy, co-author of Manpower and Economic Education, a junior high school curriculum package.

These comments are not intended to create a false dichtomy or solicit judgments about "good guys" and "ivory towers". However, they are intended to give a feel for the kind of image that is projected when presentations about curriculum ideas and products are being made.

2.0 ARE THERE CHARACTERISTICS OF DEVELOPERS WHAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?

There may be a bias against the products of social scientists as apposed to social studies experts. Atleast, there is some animosity between the two groups. Considering the fact that social studies experts control preservice and some inservice education of teachers, there may be a bias against the use of discipline oriented social studies materials. This bias does crop up time and time again at professional meetings. Whether it has as much affect on the buyinggdecisions of school districts, I am not sure.

1.0 ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

Two characteristics come immediately to mind: (1) subjects of current interest which might even be current fads such as environmental issues, China, urban unrest, etc; (2) subjects which are part of the curriculum for many schools but which are considered by most teachers to be difficult to teach, such as new approaches to teaching mathematics, economics, science. A third characteristic would probably be the intrinsic interest of the subject matter to large groups of people, such as concern over Watergate right now, interest in the hippi phenomenon or the use of drugs by teenagers.

1.0 "Are there characteristics of particular subject matters that make products which are based on them more or less likely to be adopted?"

I believe the answer is definitely yes in the area I am working on. The program I am directing is developing packages of materials which are generally, but not always, used in conducting workshop type training. The particular subject matter we are focusing on is what we think of as processes. These include processes for problem solving, planning and action taking, pupil-teacher face-to-face interaction, interpersonal team work behaviors, explorations of self as a learner, professional development in the process area and organizational development. We define a process as a particular sequence of behaviors that provide a function such as the function of planning using the system analysis procedure, the process of interpersonal communications, the process of pupil-teacher interaction to involve students in inquiry, etc. Such training has a heavy "do it" emphasis. Criteria for performance are provided and then practice with feedback on performance of behaviors or creation of products while learning the process is emphasized.

The characteristics of process learning which have implications for the acceptability of the product seem to be especially these two. We find that most people don't yet have much experience with getting objective feedback on their actual behaviors. Research has indicated that there may be no significant relationship between an individual's actual behavior and their values or intentions. Therefore, people

tend to be anxious and defensive about receiving such objective feedback. The way our materials are created and the design in which they are used needs to give careful attention to attempting to involve trainees in building conditions for openness, risk-taking and trust. They need to speak to issues of immediate relevance in peoples' lives and work so that there is personalized involvement while also legitimizing resistance so that people won't have the experience of having been suckered into self-exposures which they did not intend. The second factor that seems special about process learning is that the understanding a person has of himself will change to the extent that he is successful in learning a new process. By definition, a new or improved process adds to one's functional capability and therefore changes one's role personally and/or professionally. When individuals realize this is happening to them, they are apt to go through periods of anxiety and confusion until they are comfortable with the redefinition of who and what they are capable of being.

To deal with these characteristics, our products typically include these things. They may involve simulations so that people can try out new behaviors that are relevant but not as risky as real backhome problems. There may be films to provide confrontations with issues that have backhome relevance. There are typically exercises on communications skills and team work behaviors to build norms that will support openness and risk-taking while working on a process such as action research, negotiations, or system analysis. The introductions to the package of materials typically include warnings of problems that might occur and rationale for why training designs include certain activities. Introductions also share things

we have learned about times not to use such materials as well as the conditions under which they are likely to be well received.

There also is a sub-characteristic of learning "processes" that has an influence on the promotional material we create for our training systems. This sub-characteristic appears to us as follows. The words to use to describe the processes that our packages provide training in are generally familiar to everyone. Particular skills and techniques and concepts we are providing training in are not apt to be familiar to people. Therefore, when people read about our systems they are apt to think that they understand what the process and training in it will be like when in fact their understanding is quite different from what they will eventually experience if they go through the training. The somewhat paradoxical problem that this can create is that there is no way in words to tell a person what it will be like to go through a live experience. We therefore tend to move away from attempting to provide literal descriptions and definitions of the process or the nature of the training experience. It seems more helpful in promotional literature to talk about the kind of problems that this training can be applied to or use analogies or sometimes concrete illustrations in discussing the process for a package.

2.0 "Are there characteristics of developers that tend to inhibit or encourage use of their ideas and products?"

I believe that there are such characteristics both in terms of the developers personal orientations, developmental maturity, and style and also in terms of the biases that the developer may have for emphasizing the use of particular developmental processes.

In terms of personal orientation I believe it is important that a developer should/have a strong orientation toward understanding and being guided by felt needs, life style orientation, and expectations of the target population he is developing his product for. In order to arrive at a product that is relevant and acceptable to that target population, I have felt it is extremely important to develop temporary relationships with representatives from that target population in working together on the development of the product. The developer needs to be open to exploring how his own values and orientations effect this collaboration of the ultimate product. The input from representatives of the target population needs to be combined with the developers expertise in product development and the concepts and techniques of the subject matter to be learned, in our case one or another process.

An example in our work would be the teams of junior high school native American students that we worked with over a period of a year in creating six minipackages for such students to explore issues like, "being influenced," "getting and using help," and "checking for understanding." We spent eight months building the relationships to work together with these teams of students before the materials were ever tried with other native American students. I believe this represents "linkage" as Havelock has attempted to

define it. He talks of there needing to be a degree of mutual understanding of each other's processes between the resource person and the user. I believe a great deal could and should be said about this issue although I won't attempt to launch into it here. One point that should be made about personal characteristics of developers has to do with their developmental maturity. I am referring to such developmental dimensions as cognitive style a la Piaget, moral development a la Kohlberg, ego development a la Loevinger, and a model of social psychological self-development we have created. We believe that the evidence is striking indicating that individuals have very different ways of experiencing themselves, other people, and their world dependent upon where they are in stages along these developmental dimensions. It is not enough that materials be developed to deal with substantive issues that are relevant to peoples life styles and cultures. They must also be put in terms that are usable to the target population according to developmental maturity. Developers may easily err by putting a training exercise in terms of formal-operational reasoning when the majority of the target population have only reached the stage of concrete operational reasoning for example. Another illustration might be that a learning design based primarily on simple reinforcement learning theory could be most productive for early elementary school children. Such a design could inhibit the developmental growth of high school students. It might be preferred by teachers who are in an early, stereotypic stage of self development, but strongly rejected by teachers who have reached a relativistic way of experiencing. Implicit assumptions which a developer may hold concerning such issues appear to me to effect many recent educational training products having been poorly received in the field.

A characteristic of developers having strong biases for the use of particular development procedures to the exclusion of others may also inhibit development of acceptable products or maximally effective diffusion strategies. We use a system approach for careful long-ranch planning in our development work, however, we try not to allow ourselves to stay locked into such plans. There have been times when spontaneity and divergence from such procedures have been most profitable. Referring again to Havelock's review and summary analysis of innovation and diffusion procedures, it seems to me there are times for each of them as well as combinations of them. Generally speaking, we believe that diffusion is enhanced most by involvement of representatives of target populations in the development so that when it becomes time for diffusing a finished product representatives of the target populations can be referred to about the nature and use of that product. This seems to carry more weight than the equally necessary report of careful testing of the development of the product. We therefore work at building a network of collaborators who provide the basis for eventual dissemination rather than relying on promotional literature and technical reports to carry the load at the end of the developmental process. The "not invented here phenomena" seems very strong among teachers and school administrators regardless of the "facts." The developer who is biased toward keeping their work under tight wraps until all testing is completed may have a difficult uphill battle when he turns late in the game to the issues of diffusion.

1.0 Are there characteristics of particular subject matters that make products which are based on them more or less likely to be adopted?

Subject matters which have a large, well-defined slot in the conventional curriculum have a relatively easy time getting widely adopted, at least for a while. Each classroom needs to cover it frequently. Thus, the need for a good approach is obvious, as the limitations of old approaches become apparent, or simply for freshness new versions are sought. Anything promising is likely to be tried, and anything effective likely to be adopted. Even if the approach is liked, it is apt eventually to be replaced not only because of the frequent use which leads to desire for change, but also due to the fact that alternatives are available. Also, if it is basically the same subject matter that has for a long time played a major role in the curriculum, it is not likely that even a new version will have major positive impact. Thus, it will be difficult for users to know which version is best, with the consequent trial of one approach after another. Although I suspect new reading programs may have had a similar history, I am more familiar with the "new math". Without ignoring the newness of many of the materials placed in the new math, it does fill a well-defined larger slot of recognized importance in the curriculum. School Mathematics Study Group

recently entered the market and was adopted to some degree by a large fraction of schools in the country. It still is used, but many one-timers have gone back to more traditional math programs, and many others have switched to the multitude of new math programs that entered the competition. These new programs have varying degrees of tradition or newness, and differ only in their competency--none of them has more new concepts, most of them have less set theory, less number structure considerations, less probability, etc., than S.M.S.G. But the effects of all of them are close enough (National Longitudinal Study of Mathematical Abilities) so that there is no clear move in any one direction.

On the other hand, a new variety of subject matter, or of teaching style, may have a more difficult time becoming widely adopted. How difficult depends on the strength of the perceived need for such new directions. But it seems to me that once adopted, these programs often stay longer, or lead to even further change in the same direction. Some of them continue to be adopted more widely, although the spreading may be slow. In mathematics, the use of concrete "manipulanda" (Cuisenaire rods, Dienes blocks, geoboards, etc.) make a considerable change in the teaching style. I think this approach has not been adopted as widely as the textbook-oriented "new math", but it seems to show a more recent and still-growing phase. "Hands-on" science programs, such as Elementary Science Study, seem to be in a similar position, as perhaps are case-study oriented new social science programs.

My impression is that the "real problem solving" style of learning is even a more extensive case of this type. The subject matter--the problem-solving process itself--is really new. The learning style is dramatically different, being not only interdisciplinary but providing the student with the opportunity to consciously work on a piece of real life as a whole, with resultant action and influence out in the field as part of the adult community. U.S.M.E.S., or a similar secondary school effort, cannot spread by being put on the shelves of every classroom of every school in a state. But where it takes hold it tends to shake up the attitudes of all participants, and the structure of the system. I predict that this approach will eventually lead to a larger and wider impact than will the many varieties of standard subject matter, but over a longer period of time.

2.0 Are there characteristics of developers that tend to inhibit or encourage use of their ideas and products?

A critical factor, in my opinion, is the degree of interaction of the development process with experience in the field. Early concepts of "write it, try it, re-write it" are not as interactive as they should be. One should "write it" from direct observation of what is happening in the classroom with an idea. Not only does this make a better product, but it helps greatly in the

dissemination, as the user recognizes the imprint of the real school situation.

Another point... that it takes imaginative, first-class people (the teachers as well as those back at the ranch), to develop first-class ideas and materials, should be obvious. Nevertheless, this is neglected much of the time. This lack of real imprint is probably well perceived by potential users.

1.0 ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

I like the phrasing of this question because it makes it relatively easy to address the particular handicaps for diffusion in the area of history. To some extent, the problem that I wish to address myself to pertains to other subject matters, but it is particularly serious in history. It concerns the lack of understanding of the nature and the scope of the discipline.

First, there is the general misconception that history can be or is equated with the past, or that history is the past, translated into history books. That fallacy makes a successful diffusion of new models in teaching history virtually impossible because it often leads to the development of historical generalizations which, when subjected even to a cursory testing, prove to be untenable. It simply is a fact that a generalization, let us say, about the Cold War, however cautiously phrased, would prove to be unacceptable to a representative sample of "consensus" American historians and "radical" American historians, to many Southern historians and certainly to Soviet historians.

Once the true nature of history is understood, by the innovators in history teaching and by the teachers, diffusable models in history teaching may be successful. Those interested in an innovative curricula in history must accept the premise that history is not the

past, but that it is what various historians, past and present, working in all parts of the world, have been writing and are writing, about fragments of the past.

The second difficulty has to do with the narrow construction of history as a scholarly discipline. History as popularly understood by social studies teachers is political and military history, buttressed heavily by the reign of kings, by a division into "ages" and organized in a sequence of "facts and dates." That, of course, is a narrow and basically distorted view of history. History is an attempt to reconstruct the whole of the past. That means an interest, in addition to political and military events, in social history, economic history, intellectual history and recently psychohistory. The broadening horizons of new historical research means an interest in social movements, in intellectual trends, and cause - and - effect sequence in the course of human events, in the interactions of the rational and in the irrational in the actions of great men in history.

Unless there is a radical change in the conceptions about history, little successful diffusion of new ideas and new approaches in the teaching of history can be expected.

## 2.0 ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?

It seems to me that one of the most inhibiting characteristics of developers of new ideas in school instruction, (I refer only to the area of social studies), is the overt or implied denial of teacher autonomy. Any project rationale which led to the production of teaching materials and manuals for teachers which predicated the the "success" of the learning experiences and teaching outcomes on the strict adherence to the sequential use of the materials, to the procedures used in learning situations or to methodology to be followed, and even more importantly which arbitrarily predicted the "right" outputs, effects, and end-results of instruction, was doomed to eventual failure. The reason for this failure of diffusion ought to have been obvious to the creators of the project rationale and materials. First, many teachers, especially the more creative ones, resented an obvious infringement on their right to be autonomous in their classrooms, on their right to use their own initiative to modify or discard the pre-ordained procedures and to be satisfied with outcomes different from those envisaged as desirable by the curriculum developers. Second, no new curriculum approach, however carefully thought out, can take into consideration the infinite number of variables which exist in schools in our big and hetereogeneous country - ability levels, special conditions in the inner cities, and in the suburbs, ethnic and religious differences,

local community expectations, different conditions pertaining to the degree of freedom of instruction, etc., etc.

Thusly, a rigidly structured new curriculum with an in-built set of procedures, ignores the basic ingredient necessary for successful instruction, namely change of pace, change of teaching techniques, and the degree of flexibility which allows the teacher to adjust to rapidly changing conditions in his classroom, and to his own physical or mental condition on any given day.

It simply makes no sense, for instance, to state that a micro-teaching experience for student teachers must be limited only to three minutes of viewing the film -- that any larger sequence of the student-teachers performance in the classroom would defeat the whole value of this mode of teacher-training. Such rigidity has often soured student teachers on the entire experience because of their correct perception that in a particular situation, a short sequence, disregarding what happened in the classroom before and after, may well lead the observer to unfair and unfounded observations and evaluations.

In conclusion, it seems to me that respect for the autonomy of the teachers is an essential pre-condition for successful use of new ideas by individual teachers and their diffusion to other teachers.

1.0 ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

The most honest and direct answer to the question is, "I don't know." To the best of my knowledge there is no evidence that science materials are more likely to be adopted than foreign language programs or social studies programs. Nevertheless, some observations about factors that affect the adoption of social studies materials might be useful.

One motivation behind the effort to promote a "new social studies" in the 1960's and early 1970's has been an interest in undercutting the hold that history has had on the social studies curriculum and in increasing the time for instruction in the social sciences. The various social science disciplines used somewhat different strategies and have enjoyed mixed success.

In some cases, a social science discipline was able to tap outside groups that could help bring pressure to bear upon the prospective users. For example, less change would have occurred in the teaching of economics if the task had been left to university-based economists alone. However, through the establishment of the Joint Council for Economic Education which includes business and labor among its membership and support, and the creation of state-wide councils, the advocates of economic education were able to bring various resources and pressures to bear for improved economics instruction.

A similar phenomenon is occurring presently in "law-related" education. The American Bar Association is mobilizing state and local bar associations to encourage school systems to include instruction about law. It is often

difficult for school officials to resist pressures brought by businessmen and lawyers, nor is there any need to do so if their proposals are educationally sound. On the other hand, most social scientists do not have powerful allies in the community. Indeed, lay people often view the approaches, concepts, and generalizations drawn from political science, sociology, psychology, and anthropology as threatening. Thus, the question of which subject matter is most quickly adopted may be influenced in part by which disciplines have allies in positions of community leadership.

When a social science course is taught as an entity of its own, it is most likely to occur as a twelfth-grade elective course in sociology, anthropology, or psychology. As an "elective," it will attract relatively few students. Not only is it difficult to have a major impact upon a large number of students via elective courses, but the small market discourages publishers from making investments in expensive product components, such as films, games, cassettes, records, slide-tapes.

In recognition of the need to break into the large required courses in order to reach masses of students, some social science projects have tried to "infiltrate" history courses. The strategy of the Anthropology Curriculum Study Project was to insinuate itself into the world history course; SRSS "episodes" were intended for use in a wide variety of courses, including American and world history. This strategy obviously encounters other obstacles, especially problems of adoption lists and teachers who are puzzled by "history" materials that call for history to be approached quite differently than they are used to.

It would seem that it should be easier to change history and civics courses as they are often "required" courses, taken by all or at least a majority of students. The fact is, however, that change is difficult in these courses because certain traditions have been built up over the years regarding what is "appropriate" content. Many of the new projects must trim their efforts to cope with these traditions. One example is the widely offered, twelfth-grade course in American government that has been dominated for decades by a legal-institutional approach. It would appear that it should be easy to introduce change in this course. However, over the years certain ways of thinking about politics and government have become accepted as the "right" way. Developers who wish to offer alternative formulations find it a complex task to convince school officials that other, equally legitimate, approaches are possible. This clearly is the task the American Political Behavior course faces.

It may be easier to fundamentally alter an elective course than it is to introduce massive change in the eleventh-grade American history course, because there may be less tradition surrounding the electives. This seems to be the case for elective courses relating to population, environment, etc. Moreover, the size of the market for the required courses, as contrast to the smaller markets for electives, brings a new pressure on publishers. The opportunity to penetrate a big market may encourage publishers to manufacture expensive components, but it is likely to make them cautious about tampering drastically with the content of courses. Despite much development activity, the range of variation in approaches being taken toward high school American history seems small to me, and the basal textbooks continue to sell quite well.

There are other factors related to subject matter that deserve attention. When the American public detects a "national need," it is relatively easy to gain widespread change. I have already referred to the activities of the Joint Council for Economic Education and the American Bar Association in promoting "needs." A more dramatic example was the effort to introduce teaching about communism in the late 1950's and early 1960's. Public hysteria regarding the threat of communism led to state-mandated and locally-mandated courses on communism that reached millions of students. More recently we have observed similar efforts on behalf of "black studies" and ethnic studies.

In one sense, the subject matter is unrelated to the innovation. In my opinion, teachers worry far less about the "content" of the courses they teach and far more about finding interesting ways to teach them. For example, language labs spread rapidly without being tied to any specific foreign language; the same may be said about the widespread use of overhead projectors in schools. (In each of these cases, the diffusion effort was helped enormously by the availability of Federal funds.) In social studies, 16 mm. films and educational games are used by teachers regardless of the subjects they teach. If a "good" film is available in a school on a given day, all social studies teachers may send their classes; they have no trouble accommodating the content of the film into their subjects. The same games are used by teachers in the same school who teach different subjects, and the AEP pamphlets are encountered more than once by many students as they proceed through high school. The belief held by many teachers seems to be, if it interests students, use it and fit the subject to it.

Finally, subject matter that threatens community norms is most difficult to introduce. Parents are suspicious of courses that encourage students to explore objectively, personal and social values, religious beliefs, etc. Sex education courses are notable in this regard. There has been a massive propaganda effort on behalf of sex education, but in community after community these courses are thrown out nearly as fast as they are introduced.

## 2.0 ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?

In the field of social studies, the total population of people who view themselves as professional instructional developers is relatively small, probably less than 100 people. This would not include the hundreds of teachers who develop a lesson or a course that is used by colleagues; it also ignores the hundreds of college professors or school teachers who write textbooks or teacher's guides, as a sideline, sometime during their careers. I am identifying "developers" as those people who are seeking to make a career of developing new instructional products for schools.

The professed norm for all developers is to improve instruction in schools. However, what is an "improvement" is subject to vastly different interpretations. For a developer, improvement usually means offering something different from what schools now do and different from what other developers are doing. A developer must not only be accepted by users, he hopes also to win the approval of his professional peers. This requires that a successful developer be always on the cutting edge of development in his subject field, both in the content he advocates and in the instructional methodology he promotes. The "Portsville Map" from the High School Geography Project and the "site map" from the Anthropology Curriculum Study Project are examples of lessons other developers admire. Because the norm is for developers to break new ground, those who merely copy the ideas of other developers are held in low esteem. Thus, there is often little reinforcement of good ideas. For example, no developer is likely to start a new project based upon the "jurisprudential approach," because that approach is so closely related to Donald Oliver, James Shaver, and Fred Newmann. (In

constrast teachers who pride themselves as innovators frequently justify their status by being early users of the work of special projects. Such teachers use experimental materials before they become widely available to others.)

The norm that developers be different and advance the field of instructional development in their subject fields collides with the need to provide the user with what he wants. While few developers ignore users entirely, they rationalize and interpret user needs so as to fit their needs. (It is not difficult to articulate a need in almost any subject field in social studies.) Nevertheless, what a particular teacher would like to have to satisfy a need he feels will not be satisfied by a developer unless he personally is excited or at least interested in the idea.

Instructional materials development is demanding work in the sense that if it is taken seriously and performed well, it requires much time and commitment on the part of the developer. Assume a developer who is about to launch a project that will consume five years of his life. This is a large amount of time in a professional career. Neither teachers, professors, nor deans are regularly required to make similar commitments. For a developer to make such a commitment he must satisfy himself that the project will be intellectually exciting and professionally rewarding -- which means that his peers will approve his work. Frankly, it is not enough to know that he has helped a civics teacher in Odessa, Texas help students match state capitols with states more efficiently. He must believe that he can help the teacher in Odessa teach something the teacher might not have chosen to teach, left to himself, in a way that would not have occurred to him.

The drive to be different, to be fresh, to be on the edge of a field complicates the diffusion process, although developers are usually alert to the practical consequences of being too different and curb their instincts in various ways. For example, they appraise carefully state adoption policies, the amount of money schools can spend for instructional materials, etc. Nevertheless, more than publishers, developers would rather risk the failure represented by low market return than the charge that their materials are pedestrian or that they are merely interested in making money. (Publishers tend to use market acceptance as the principal criterion for success; developers judge market acceptance as only one important criterion.)

Developers, like others, are products of prior experience and present environments. For example, the style of instructional materials developed at Carnegie-Mellon University was influenced mightily by Edwin Fenton's work in advanced placement courses in the Pittsburgh Public Schools which had in turn been influenced by some of the work Paul Ward and others were doing in the undergraduate history courses at Carnegie Tech. The materials Dick Brown created clearly show the stamp of prior activities at Amherst University.

The professional training of the key developers influences the product. Don Oliver's materials took the form they did in part because of his location in a graduate school of education in which he was preparing specialists in social studies education. The developers who worked with him shared his views of social studies and attempted to operationalize their views through their materials. The sociology project was led by sociologists, who were

concerned that students grasp important aspects of sociology knowledge and inquiry skills. When projects have been directed by the academic disciplines and have recruited professionals from the disciplines as developers, the tendency has been to attempt to translate important ideas from the discipline in a form understandable to pre-college students. When the principal developers have been recruited from among teacher educators or from classroom teachers, there has been less concern for representing the academic discipline and more interest in grounding the subject matter in traditional notions of social studies and citizenship education and somewhat greater interest in the instructional techniques used by the project.

A few of the Office of Education social studies projects were based in school systems. Few, if any of these, have had a major impact on social studies instruction nationally. In part, this stems from the limited human resource base available to the project; in part it stems from parochial conceptualizations. There is a tendency for locally-based projects to concentrate on satisfying local needs.

In general, the most successful projects have been those which have been based on university campuses or which were located in independent bases. While the university-based projects find it easier than school-based projects to assemble the necessary human resources, certain pitfalls must be overcome by projects located on university campuses. They, too, can be affected negatively by local concerns. Developers with concurrent academic responsibilities may be distracted from project work; too often the quality of development depends upon the quality of doctoral students available; sometimes

institutional hierarchies affect project decisions. To be successful, the university-based project needs to assume a discrete life of its own, and the professional rewards for the developer must be seen as related to the project's success and not to the more traditional reward systems of universities.

Much can be said in favor of creating independent bases for the operation of curriculum projects. Those who take positions on such project staffs know that their rewards and satisfactions derive from the project. Such a mechanism also may attract risk-taking personalities who will affect project materials in desirable ways.

I suspect that some groups of our society are badly under-represented among developers. The vast majority of developers appear to be white, male, middle-class, college and graduate-school-educated, political liberals. Thus, as many Europeans who have studied our products have charged, there is a tendency on the part of developers to support and maintain the present social, economic, and political values of our society. Most project directors would object to the foregoing statement because in contrast to traditional textbook authors, they believe that they have treated certain topics fairly and openly which would not have been included customarily in social studies classrooms that depend upon traditional materials. While this is true, in contrast to some social studies products produced abroad, we market little that is aimed at fundamentally reordering society. Rather, most of the thrust in the "new social studies" has been directed at raising the intellectual level of social studies instruction, making the field more intellectually

respectable. By and large our developers represent a strata of society that is succeeding within the present system. I believe this is revealed in the products they develop.

Given the adoption of procedures used throughout this country, especially in "state-adoption" regions of the nation, it seems unlikely that developers who wished to represent more radical views of society could have succeeded or achieved greater adoption success than the developers currently employed. Nevertheless, it is worth noting that present products, while probably adequately representing mainline, liberal views of society, do not fully represent the widely diverse views held by segments of the society. This probably results, in part at least, from the type of people who are employed as developers.

1.0 ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

Yes. Products drawn from traditional subject matter areas, such as civics or American history, are more likely to be adopted than products drawn from the "newer" social sciences, such as psychology and anthropology. The obvious reason for this is that teachers tend to select materials in subject matter areas in which they have been trained, and many teachers have little background in the newer social science disciplines. Also, many school systems mandate the teaching of traditional subjects, particularly in the social sciences area.

In my own curriculum development work, which draws heavily on the behavioral sciences, I have frequently encountered initial resistance to the instruction of "unfamiliar" social science content, but this is often followed by considerable enthusiasm and excitement on the part of the users. The "Hawthorne effect" resulting from the replacement of the old disciplines with the new can produce a chain reaction of innovation once the initial resistance to change has been overcome.

2.0 ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?

My experience in this area is limited, as I am not too familiar with what other developers have encountered, but the intense loyalty for their product which developers tend to acquire often blinds them to the real problems and needs of users. Alteration of the product by the user is often regarded as "degradation" by the developer, whereas such changes may often be crucial to the product's success in the user's hands. This problem will, doubtless, never be fully solved because of the developer's powerful emotional investment in his creation.

Some developers manage to overcome this difficulty somewhat by maintaining a separate teacher education and school relations staff whose task is to understand the user's needs, and to assist the user in modifying the product to suit his own requirements. The "middle man" function performed by sensitive teacher educators is a crucial element in any effort to bring about a closer relationship between developers and users.

## 1.0 ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

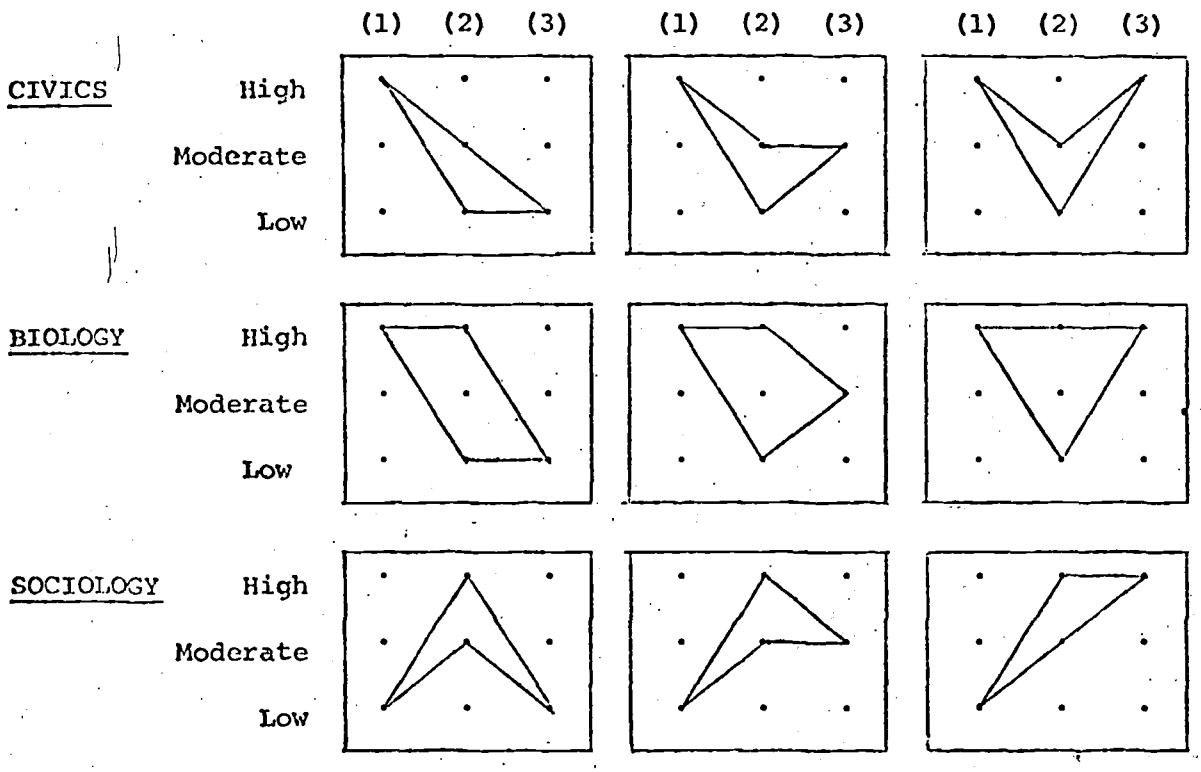
The following response is limited to the formation of propositions about three broad characteristics of certain academic subjects that relate to the likelihood that products based upon these subjects will be adopted by schools. The first characteristic is the degree to which the subject is established in the curriculum, whether or not, for example as with civics in the social studies, it is considered essential to the "proper" education of citizens. The second characteristic is the extent to which the subject deals with cultural features that are considered sacred by all or some of the people in the society; for example, the study of evolution in biology. The final characteristic is the degree of innovativeness incorporated in new curriculum products in comparison with existing materials.

In this discussion the first two characteristics are held constant and the third is varied; levels of establishment and ranges of sacredness are assumed and three degrees of innovativeness, or departure from conventional curriculum formats, are explored in terms of patterns of resistance to new products as they are more or less innovative than existing programs.

It is also assumed that the amount of resistance to the adoption of new curriculum products will be higher for high degrees of each of the three factors: subjects firmly established in the curriculum will be more resistant to change than newer subjects; materials that treat a lot of sacred topics will be resisted more than those that deal with nonsacred or technical subjects; radically innovative products will be resisted more strongly than traditional programs.

In the diagrams that follow the areas contained within the lines

connecting the points for different levels of (1) establishment, (2) sacredness, and (3) innovativeness are intended to represent the "shape" of resistance to change over time as potential clients for the innovation might encounter each variable. The schemata are intended to provide the reader with means for speculation about the interaction between the three characteristics.




The shapes in the diagrams for civics suggest that initial resistance to adoption of any new materials would be high because civics is so entrenched in the curriculum (1) but would drop somewhat because the subject is generally "safe" with regard to sacred topics (2), continue to drop off if the new materials were not very much different from existing programs (3), but rise again for highly innovative products. An unanswered question is whether or not any decline in resistance would be sufficient to overcome the prevailing level of complaceny towards the familiar, established civics program.

Biology curricula, while as highly established in the curriculum as any of the social studies disciplines, would seem to have a lower overall level of resistance because of the extent to which science deals with nonsacred topics. Veterans of the struggles over the treatment of evolution in the BSCS biology versions might contest such a generalization, especially since the struggles have been renewed in parts of the country, but it seems reasonable to assume that the breadth of biological studies overcomes resistance to particular concepts and theories.

Sociology products have an initial advantage in resistance to adoption because the subject is not widely established in the curriculum. However, the sociological motif of debunking beliefs that may be considered by some as sacred leads to rising opposition to adoption especially when coupled with high innovativeness in product design.

Researchers interested in diffusion of innovation in education would do well to study the literature of psychology and sociology for data on the nature of resistance to change and for stragegies to stimulate adoption of innovative products and processes.

## 2.0 ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?

Developers with institutional sponsorship--the American Sociological Association, the Association of American Geographers, the American Anthropological Association--have more legitimacy for their curriculum products than a group of teachers or professors with district or departmental affiliation even if they are very dedicated and conscientious.

Developers who are distinguished scholars--Robert C. Angell, Nicholas Helburn, Malcolm Collier--lend more authority to a curriculum product than persons just starting out in curriculum development no matter how creative or able.

Developers with the imprimature of government or foundation funding agencies have more influence on decisions to adopt a curriculum product than persons who produce materials independently or for commercial firms.

Developers who are fully subsidized by adequant funding grants have enhanced ability to produce better curriculum products than persons who work on materials on their own time or with small budgets.

Taken in combination these characteristics provide even more power to certain developers with regard to influencing prospective users of curriculum products.

*1.0 ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?*

*The subject matter does not have a tremendously large impact on whether or not a set of curriculum materials is adopted. Those materials which are creative and involve both students and teachers will be adopted notwithstanding the particular content.*

*2.0 ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?*

*Some curriculum developers began a program of dissemination from the very inception of the project. This holds true of both government-funded, privately-funded, and private publishing house supported curriculum developers. This enabled them to remain much closer to the actual needs of their intended users. Revisions were easily made and were made in a more effective manner than those of developers who waited until the materials were nearly complete before beginning their process of dissemination. The subject of the High School Geography Project is due in large measure, I believe, to the fact that teachers were involved from the very beginning as co-developers. With the complexity of HSGP and its relatively high cost, I do not believe that it would be as successful had not teachers throughout the nation been involved in its development, testing, and revision. The Concepts and Values series from Harcourt has encountered difficulties in dissemination for the same reason. I was instrumental in encouraging the elementary district in which I live to adopt Brandwein's materials. But, I encountered obstacles because the material seemed too complex and too difficult for many of the teachers to understand. However, schools in which this same Concepts and Values series was piloted have a much more positive view toward adoption because teachers were involved in feed-back and revision procedures. The same can be said of the early Amherst Series Project in which thousands of teachers across the United States field tested the pilot series. In my opinion, the Amherst Series is not as attractive as many other curriculum materials, but the cadre of pilot teachers spread the news of the series throughout their schools and local areas.*

## 1.0 ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

The possibility for the adoption of products at the elementary school level is directly affected by the characteristics of the subject matter. For example, if one develops a product concerned with reading or arithmetic, the schools will express interest because many of them see teaching these two subjects as their prime function. However, since pupil performance (primarily on standardized tests) in these areas is what leads to support or criticism of the schools, a great deal of proof of effectiveness will be demanded before the product is adopted. Frequently, the kind of proof desired (success on standardized tests) emphasizes goals which have little or nothing to do with the product. The best example of this situation has been the controversy over so-called "modern" mathematics. In other subjects such as science and social studies, the elementary school is much less committed and is rarely criticized for lack of accomplishment. Therefore, new products are looked at and evaluated to a greater degree in regard to the stated aims and objectives of the product. Although this is an intellectually more satisfying experience for both the schools and the developers, problems arise when it comes to making necessary financial commitments to implement the product. Since the schools do not really perceive the product as an integral part of their operation when budgets become tight or parental pressure increases, most resources are usually allocated to more of the traditional reading and arithmetic programs. This is true

even though a hands-on approach to science or social studies might be much more effective in the long-term development of overall language skills in the pupils. For example, few schools question SCIS, ESS, or AAAS science because they do not include all topics found in traditional textbooks. On the other hand, many schools agree to the value of one or more of these programs but do not implement them because they feel they do not have the money and/or the time.

There are also significant differences in the nature of the various disciplines themselves. Although one would expect these differences to affect the possibility of adoption, this seems to be a minor factor at the elementary school level.

## 2.0 ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?

Certainly the way in which the developers present their products to the public can have a significant effect. This can range all the way from personal characteristics which turn potential users on or off during public presentations to more substantive considerations where the developers' style of operation tends to encourage or discourage use of the product. For example, some developers are totally committed to precisely stated, narrow behavioral objectives for which they can develop competency measures as the basis for their program. This will affect different users in different ways. Some will adopt the program because of these, others will not consider it for the same reason. If developers commit themselves to popular educational "fads" and preferences change, valuable products may be lost to the public. More and more, the schools and other users are becoming concerned about the nature of the whole development team and its make-up. Questions such as, 'What are the team's qualifications, prior experience, etc.," are being asked more and more frequently. The prestige and prior experience of the developers and their instution (university, regional laboratory) can also have a significant effect on causing the user to look into and try something. Many products are tried because of where they were developed or the amount of federal funds involved in their development. Such considerations affect initial trial of materials, but the decision to continue a program is usually made in response to what happens when the program is used in the school.

1.0 Are there characteristics of particular subject matters that make products which are based on them more or less likely to be adopted?

There do not seem to be inherent characteristics of any subject matters which would influence the likelihood that products based on those subject matters would be adopted. There do seem to be two factors related to subject matters which will influence likelihood of adoption. These are (1) the relative importance of the subject matter in the curriculum, and (2) the relative difficulty perceived in teaching or learning the subject matter.

Both reading and mathematics, for example, are perceived as important subject matters in the primary school curriculum. Both these subject matters are also often described as difficult to teach and to learn. The experience in this project has been that there is great and constant demand for products based on these subject matters--even though there are many products available and in use in the schools. Although economics, for example, might be perceived as difficult to learn, it is not considered as an important subject matter in the primary school curriculum and few innovative products based on it are available. Cursive writing is an important skill to be learned in the primary school, but it is perceived as less difficult to learn than other subject matters and few innovative products based on it are available.

2.0 Are there characteristics of developers that tend to inhibit or encourage use of their ideas and products?

There are four characteristics of developers which may affect use of their ideas and products. These are first, the reputation of the developer and/or the reputation of the institution with which he is affiliated; second, the salesmanship exhibited by the developer; third, (and this may depend on the product user), whether or not the developer is working within his own discipline; and fourth, (this may also depend on the product user), whether the product is developed largely by a person whose specialty is within one discipline or by an interdisciplinary team.

1.0 Are there characteristics of particular subject matters that make products which are based on them more or less likely to be adopted?

Considering education as a "subject matter", I believe that education possesses characteristics which make educational products difficult to diffuse. Education is an area in which the criteria of success are both ambiguous and debatable. Is success the enthusiasm of a child, the teacher's ability to execute the strategies of a new curriculum, the child's mastery of new idea, and so forth? Even more serious than the ambiguity of criteria is the question of which educational purposes are desirable. One way of construing this question is to contrast the three R's against some broader conception of educational goals; another way of viewing the issue is to conceptualize the various ways one can approach the study of one subject area, e.g., basic generalizations, structure(s) of the discipline, the effect of content on personal beliefs. Little doubt exists that educational goals are debatable.

If educational goals are agreed to be ambiguous and debatable, then diffusion becomes much more than a technical process. In particular, the lack of consensus on which goals are desirable introduces into educational diffusion an element of persuasion. The developer of an innovation may need to convert the recipient of an innovation to a new set of purposes before the innovation can be diffused. As a result, educational diffusion often has religious overtones (or advertizing, if you prefer a secular orientation).

Attempts at conversion, of course, often fail. Fortunately, educational institutions contain people who have more power than others so that innovations can be adopted even if conversion fails. Adoption, however, does not guarantee implementation. Although I do not mean to glorify the role of the resister of change, it should be clear that I do not believe that innovative materials and strategies automatically deserve diffusion.

In summary I believe that education, because of the ambiguity and variety of its goals, poses unique problems for the diffusion of new products. Educational diffusion is not just merely a problem of getting a product from one location to another; it is also a process of weighing conflicting purposes.

RESPONSE TO QUESTIONS



1. ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

Our experience indicates that there are characteristics of certain subject matters that make products that are based on them more or less likely to be adopted. One characteristic being if there is an apparent national or regional need for the product at the time it is available. An example of this would be the apparent need for science, mathematics and foreign language curriculum materials right after the Russian Sputnik went up. Even though the American Association for the Advancement of Science had already spent several years gathering data on the need for Federal support of science and mathematics education, including funds for equipment and supervisors, it was only after an apparent lead in these academic fields by the Russians that such a bill as the "National Defense Education Act" could get governmental support and be passed. It has since, of course, been modified to include other subject areas that also apparently fulfill national needs.

Another characteristic appears to be that the subject matter should be well established as a necessary requirement in a school's curriculum or that it is clearly recognized that it should be a necessary requirement.

A third characteristic may be that there are funds already available, or about to become available, for the purchase or implementation of the product into the system. If such implementation means additional financial cost will be

involved, the chances for adoption seem to be quite low unless such funds are readily available.

A fourth characteristic is that the product that is going to be adopted should not be one whose use will change drastically in the forseeable future. If it appears that the product is only good for a temporary solution, then its chances of being used are probably much lower than if its going to be a more permanent change.

A final characteristic that also affects costs would be one in which the particular subject matter requires a great deal of retraining or restaffing for change to occur. The overall point being developed here is that for a new product to be used a change has to be made. And if the change is a drastic one then there will have to be truly apparent reasons for such a change, and financial considerations can frequently be used as the excuse for not making the change. The status quo is always easier to maintain than to be modified.

2. ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?

Characteristics that might tend to inhibit or encourage the use of their ideas and products would certainly include information on the past experience individuals or schools have had with the developer's past ideas. The experience of the ideas having been well developed successful ones would certainly tend to increase the likelihood of the use of his further ideas or later products. If on the other hand, the ideas were not appropriate to the use in which they were employed, the failure may not be the developer's fault.

Chances of his ideas being used again may also go down if the developer seems to be working away from his particular competence, or not working directly with those fields in which his ideas or products are going to be used. For example, if there seems to be a detachment, intellectually and possibly even physically, from the institution or system in which the ideas will later be implemented they may not be considered. Even how well known the developer may be on a geographical basis will enter into the possible diffusion of his ideas and products. Certainly general popularity of an individual enters into acceptance even if his ideas may not be as good as they might be. Also, there is a question of how closely the ideas or products of an individual developer are tied to the practical realities of the situation where they are intended to be used.

1.0 Are there characteristics of particular subject matters that make products based on them more or less likely to be adopted?*

1.1 Secondary School Science

A particular characteristic of the natural sciences is the production of new knowledge in ever increasing amounts. Frequently, new discoveries are reported in the daily press and featured on television. Students as well as parents feel that science courses should be kept up-to-date. The science curriculum movement of the late 1950's and throughout the 1960's was an effort to modernize courses by bringing the subject matter in line with the current "structure of scientific disciplines." The funding agencies, principally NSF, made grants to research scientists to "improve the content of secondary school science courses" by incorporating modern theories and concepts and devising new laboratory experiments that would reflect the features of scientific investigations. By using research scientists from colleges and universities to write pre-college science curricula, authenticity and scientific validity were immediately conferred upon the courses.

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*To focus on the particular questions raised by the planners of this conference it is sometimes necessary to give examples out of context. The comment should not be read as representing in and of itself the whole of a diffusion process as it relates to new instructional materials or practices.

1.0



Much of the success of the "new" science in terms of adoptions was due to the research prestige of the developers. They were Nobel Laureates, members of the National Academy of Science, winners of prizes and medals for scientific achievement, faculty members of recognized scientific institutions, officials in high government offices or members of national scientific commissions. They were scientists who could enlist the interest of members of professional societies both nationally and internationally. These factors were critical in getting the new programs accepted in schools.

The facts and laws of science (as well as of mathematics) are the same the world around and communication channels (mostly through 100,000 technical journals) to keep everyone informed have been under development for over 200 years. This gave voice to the scientists' efforts to improve the science background of high school graduates. It is not surprising that the science curriculum reform movement in the United States became world wide. Adaptations of the BSCS biology programs are used in sixty countries and written in over twenty languages.

To assist in the implementation of the 1960 series of modern science courses a variety of institute programs were initiated to "up-grade" the teachers' background of scientific information deemed essential to implement the new program. The experience in the United States and in foreign countries was a

rather enthusiastic acceptance of the new course content and much of the laboratory hardware, but with little understanding of the rationale, teaching style or intent of the simplified laboratory equipment. The change, for example, was from memorizing leaf structure to memorizing the Kreb's cycle; laboratory experiments were designed by the developers to display the investigative processes of science, which teachers, however, chose to grade on the basis of "right" answers, and the "goal to think like a scientist" was seldom appreciated.

Several generalizations can be distilled from this experience with the "new" science programs of the past decade or so: a) A curriculum reform in science which consists primarily of up-dating subject matter and realigning it in terms of a discipline structure is accepted by well-trained teachers; it frightens the untrained or misassigned teachers; b) The success in the diffusion of the 1960 curriculum reform products in science teaching was more the result of prestige factors, the pressure of a technical manpower shortage, and widespread attention in the public press than of any rationale concerning "what knowledge is most worth" for living in a modern age of science and technology. Science teachers found it attractive to be considered "scientists" and to be offered paid opportunities to engage in "research" projects. Brighter students were provided the same opportunities and enjoyed being referred to as "junior scientists". Their efforts were rewarded by

recognition at local and national science fairs and by a visit to the White House for the very best.

## 1.2 Elementary School Science

The elementary school science curriculum developers sought in one way or another to devise materials that represented "good" science and which could be understood by children. Over a dozen experimental programs were started and each one had unique characteristics. For one reason or another only about half were completed and have become generally available to schools. Some of the difficulties encountered in diffusing the modern elementary school science programs are:

a. Science does not have a firm position in the elementary school curriculum. The recent pressures to improve the reading competency of children has served to decrease the time devoted to science, regardless of the program used.

b. Elementary school teachers have little background in science and seldom appreciate what it is all about. They fear, for example, that children will ask questions they cannot answer. It is difficult for them to recognize that the AAAS program, Science: A Process Approach, is actually science.

c. There are over thirty commercially available elementary school science text series (K-6 or K-8

1.0



grades) on the market, in addition to the experimental programs. Principals and supervisors intuitively feel some of these programs must be better than others, but which ones? The Far West Laboratory for Educational Research and Development has produced an Elementary Science Information Unit with descriptions of six new elementary science programs to help teachers make comparisons between projects and to assist in making selections.

Factors which favor the adoption of secondary school science programs are not generalizable to the elementary school situation, where teachers generally are not science oriented.

2.0 Are there characteristics of developers that tend to inhibit or encourage use of their ideas and products?

There appear to be characteristics of developers which have had a direct influence on the use of their products. At the beginning of the science curriculum reform movement the developers ignored school administrators, parents, students and science educators, and attempted to introduce their product directly into the classroom via the teachers, for example, PSSC physics. Descriptions of progress on the program were more likely to be found in scientific journals than in publications for educators. The only published statement of objectives for the CHEM study project appeared in an article written by Glenn Seaborg and published in Chemical and Engineering News, a weekly semi-technical magazine. Pamphlets and hardware were displayed at national and regional meetings of science teachers.

Roughly, with each succeeding curriculum project (following PSSC), efforts were made by developers to establish lines of communication with school administrators and with relevant science teachers organizations. Newsletters, talks and displays at regional and national meetings were the usual procedure. These presentations were, for the most part, reports of progress rather than to stimulate a dialogue about science teaching or

curriculum change. -16-

The American Institutes for Research in the Behavioral Sciences has recently studied twenty educational products to assess their potential impact and "to provide empirical case study data relevant to current hypotheses about innovation and change in public school education."[1] They found that the

1. Crawford, J.J., Kratochvil, D.W. and Wright, C.E. Evaluation of the Impact of Educational Research and Development Projects. 1972. Palo Alto, Ca.: AIR.

developers of educational products all too often failed to make long-range plans to introduce their product to educators. Evaluation measures to indicate the educational effectiveness of the product were also neglected or lacking.

The BSCS involved more than 1000 high school teachers in the development or try-out of the pilot biology materials. Each teacher received a certificate of participation in recognition of his efforts. The initial success of BSCS in getting adoptions was greatly influenced by these personal contacts before commercial publication. Special publications aimed at target audiences such as guides for conducting in-service programs with specific day to day plans, helped to inform institute directors about the significant characteristics of the BSCS programs and also served to stimulate adoptions.

It appears that science curriculum developers who carefully plan to display their product on every conceivable occasion and who also create many of these opportunities have the most success in terms of getting adoptions.

2.0 Characteristics of Developers -

In the dissemination of American Political Behavior, I found that the product and I, as a consultant, were welcomed with open arms when individuals in the target audience or system had had personal experiences with the developers of the program. Some people had read John Patrick's papers on political socialization; some had used Howard Mehlinger's booklet on totalitarianism; others had participated in NCSS pre-convention clinics conducted by the developers and many had heard one or the other give presentations. A willingness to speak at meetings across the country, and an ability to talk to teachers' concerns in oral presentations and in written material facilitate use of developers' ~~their~~ materials.

1.0 ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

Yes. All other things being equal, in the social studies those materials which are least threatening to the status quo and its supporting power structure are more likely to be diffused (especially implemented) than are those products that actually are, or are perceived to be, threatening.

In my capacity as director of an economic education program, I was once asked to describe the way in which economic education could fit into an existing school course of studies. I stressed the need for critical analysis of existing economic conditions as a major purpose of any effective program in economic education. This was not what my audience of potential implementors wanted to hear. It came as no surprise to me that nothing really new was done to the curriculum.

In another instance, I was approached for ideas on how to improve upon the ninth grade social studies course in given school district. After indicating to the revision committee some of the (at that time) recent developments in courses at that grade level intended to develop problem solving ability in students and consisting of material relevant to the students' needs and the community's concerns, I was informed about a year later that the committee decided to re-institute a subject that was dropped several years ago from the curriculum: ancient history. The reason given by the chairman of the committee was refreshingly frank, but distressingly reactionary, "It was the safest compromise we could reach!"

2.0 ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?

Yes. One of the most effective inhibitors to diffusion is the requirement established by some developers that any prospective user of their product must comply with specified in-service training or special instructional sessions during which they are presumably inducted into the "proper" way of using the materials. I have had several teachers express an interest in Man: A Course of Study, but this interest waned and in some instances disappeared when they were informed that certain in-service workshops were required before they could have access to the materials.

A characteristic of developers that tends to encourage diffusion is the tacit recognition that teachers are capable of making their own determination of how they can best use the newly developed materials in an instructional setting. Not only is such a situation less threatening to the teacher, but it also is less condescending. I have seen Amherst Project materials used by teachers in a variety of ways - some of which would probably not be endorsed by the developers. But at least there was no blanket prerequisite that the prospective implementor had to meet.

1.0 ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

Yes, at the secondary level subjects that are traditionally part of the curriculum such as history, geography, economics, are more apt to find a bigger market for their materials than those subject areas such as sociology (social problems), psychology, political science, which are more tangential to the secondary curriculum. In the elementary school, materials that are "social science" oriented, covering a number of disciplines (subject areas) are more appealing since they fit in better to the curriculum of elementary schools.

2.0 ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?

This point puzzles me. I don't know but would be interested in exploring this point.

1.

ARE THERE CHARACTERISTICS OF PARTICULAR SUBJECT MATTERS THAT MAKE PRODUCTS WHICH ARE BASED ON THEM MORE OR LESS LIKELY TO BE ADOPTED?

Yes. First, certain subjects at particular times tend to be in "vogue." In the '60's it was science and mathematics, in the early seventies, ecological and environmental education. Shifts in emphasis often follow popular concern over particular problems.

Secondly, assuming that the question means: what factors specific to particular subject matters are related to textbook or curriculum adoption by states or school districts? - I would answer that the variables specific to the nature of the discipline are far less critical than variables related to perceptions that teachers, administrators and laymen have as to what purposes of schooling are. For example, as long as major elementary school pupil probress measurements are made in the fields of reading and arithmetic, then adoptions are going to be tied to those programs most similar to the measurement instruments used.

The quality of educational programs is generally counterbalanced [illegible]st the cost of the program. In this case, programs requiring ma[illegible]ive materials which are expensive frequently loose out to those whose format is a vicarious picture-print type.

Third, it has been my experience that undergraduate students who are studying to be teachers often shy away from "tough" subjects such as mathematics and science. As a consequence, when on adoption committees, they tend to select materials that look "easy" to teach and involve few manipulatives. (This problem can be overcome through carefully designed undergraduate programs.)

2.

ARE THERE CHARACTERISTICS OF DEVELOPERS THAT TEND TO INHIBIT OR ENCOURAGE USE OF THEIR IDEAS AND PRODUCTS?

I believe so. Most of the federally dunded curricula people were unbelieveably naive in assuming that virtue always triumphs. Well organized sales forces where a personal touch is maintained with teachers and administrators, and where a freely used expense account is applied, seem to be much more effective than scholarly articles published in journals, many of which are never seen by the consumer.

There is a second subtile problem. Academicians, preparing curriculum materials for children have a "hidden hierarchy" audience. Many write first for their colleagues, then for teachers, and finally for children.

Many fine workshops have been held, frequently N. S. F. funded. Unfortunately, these have reached but a small fraction of the people who make the curriculum decisions. At a recent ERIC session ('73 NSTA) many elementary school teachers attending said that they had not heard of any of the curriculum development projects of the '60's. THE MINNEMAST PROJECT has been under constraint relative to advertising and promotion. It has not had funds for advertising in national teacher magazines, nor have we had funds to supply representative materials to adoption teams when such was requested. (It is my understanding that part of the reason for this decision was that expending federal funds to purvey programs in direct competition with private industry was actively opposed by industry and was considered by some policy makers to be an inappropriate expenditure of tax dollars. It is interesting to note that in the case of several of the elementary school science curricula, developed under federal funding, which are now in the hands of private industry, that respective companies have developed in-house programs which are sold by that company in direct competition with the project-written programs.)

## 1. CHARACTERISTICS OF PARTICULAR DISCIPLINE

a. Its presence in the high school curriculum is the most determining factor. It's obvious, but American History is the biggest adoption. Anthropology is perhaps the smallest.

b. Some disciplines have unique needs. Geography needs maps and airial photographs. Anthropology may want artifacts. History, increasingly, wants copies of orginial documents. Public opinion studies.

c. Lack of jargon makes history more palatable to students than sociology, economics, etc. (for required classes).

## 2. CHARACTERISTICS OF DEVELOPER

a. Willingness to Travel.
Is there any evidence that workshops have impact. Mehlinger and Brown travelled widely. Did that have similar impact?

b. Has he/she taught in public schools? Teachers want this, but does it have impact?

c. Does he/she have "professional" standing? Is this a clash with "b"?

d. Is development part of a network of contacts?

e. Doubt that developer's personality is a factor.

f. How tight is their model - does one need a new jargon to use it?

g. Do they demand workshop as prerequisite to using? Does that limit adoption?

h. Content center developers are less likely to be disseminated them client-centered developers. USOE Educational Information Consultants (regional) are client-centered.

1.0 Are there characteristics of particular subject matters that make products which are based on them more or less likely to be adopted?

Although a curriculum product in one subject matter is probably no more or less likely to be adopted than one in a different subject matter, there are certain characteristics of products which are more likely to be adopted or adapted: 1) the product is highly specific and mechanistic (e.g. a new math textbook or programmed learning materials); 2) the product requires only minimum changes on the part of users; 3) it is easily marketable; and 4) it is perceived as a new or improved product.

2.0 Are there characteristics of developers that tend to inhibit or encourage use of their ideas and products?

Those developers who do not recognize or take into account the real constraints on users will often find that their products cannot be feasibly adopted or adapted by users without drastic changes in institutional arrangements. A comparative example here is that the SRSS episodes can more easily infiltrate existing curricula than the ACSP course which requires adoption and inclusion of an Anthropology course in the secondary school curriculum.