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INDIVIDUALIZING INSTRUCTION, A REPORT OF THE FALL DRIVE-IN CONFERENCES, UMSSP.

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THIS PAPER DISCUSSES THE 12 AREAS OF CHANGE IN SCHOOLS--MULTIPLE CLASSES, TEAM TEACHING, USE OF TEACHERS' AIDES, SHARED SERVICES, MODIFICATION OF EXISTING FACILITIES, USE OF PROGRAMED MATERIALS, FLEXIBLE SCHEDULING, USE OF SPECIAL MATERIALS, INSERVICE TRAINING, USE OF NONGRADING PROCEDURES, INCORPORATION OF RECENT TECHNOLOGICAL DEVELOPMENTS, AND EMPLOYMENT OF CURRICULAR CHANGES. THE NATURE OF AND THE NEED FOR INNOVATION IN GENERAL ARE DISCUSSED, AND EXAMPLES OF CHANGES THAT HAVE TAKEN PLACE IN MINNESOTA SCHOOLS ARE GIVEN. (CL)

INDIVIDUALIZING INSTRUCTION

A REPORT OF THE FALL DRIVE-IN CONFERENCES, UMSSP

JOINTLY SPONSORED BY

The Kettering Foundation and The Upper Midwest Small Schools Project

UMSSP
COLLEGE OF EDUCATION
UNIVERSITY OF NORTH DAKOTA
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INTRODUCTION

The mushrooming of knowledge, the crowding of schools, the development of new equipment--all tax a teacher's ingenuity in searching for attempts to present better selection of materials in a more rewarding presentation geared for individual students. Innovations are seldom pre-planned in a lengthy manner; they develop through a teacher's attempt to solve a particular problem. Because similar problems are experienced by teachers across the country, innovations follow similar patterns. The difficulty of teachers to communicate with each other has been a major stumbling block in facilitating change and increasing the efficiency of change.

The Upper Midwest Small Schools Project was developed to assist teachers in incorporating change. Its strength is in its multiple mind approach in identifying problems and searching for ways to best solve those problems. The exchange of information between teachers, and with the assistance of experts, should facilitate this change and the incorporation of new techniques. These attempts to individualize instruction are certainly not new. Discussions of the individual child have been continuing throughout this century. Only recently, however, have the necessary resources and technical developments made possible the individualized school program.

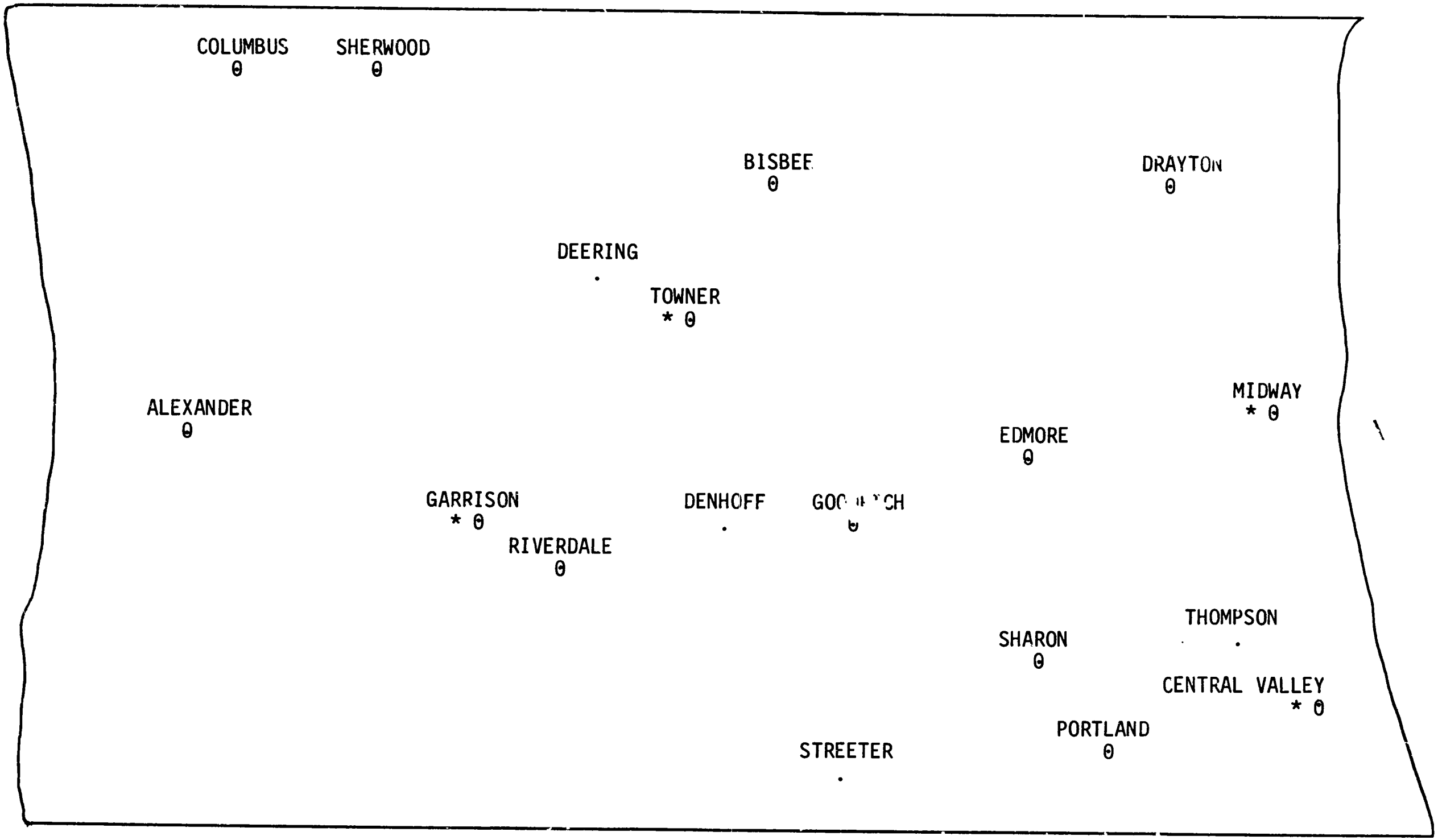
With the assistance of the Kettering Foundation a series of workshops were presented during the fall of 1966. Aimed at assisting teachers in small schools, the general tenor of the meetings was to present an over-view of both the intent for individualizing, and some ways to individualize. It was recognized that no specific answers could be made at this time. Rather, the inten-

tion of the workshops was to stimulate the creative teachers into searching for new ways to select and present the content for which they were responsible.

This is a report of those workshops. The many intangible activities involved in a workshop, of course, cannot be included. The happy hours of discussing specific ideas with teachers, the exchange of information between teachers, the excitement when a teacher locates a particular type of equipment or material that is suitable for her classroom--these and many other "incidental" activities are part of a workshop that is impossible to record. It is hoped that in subsequent meetings some of the ideas developed in this workshop can find a firm root in the schools of this area.

To thank all those who made the series of workshops possible would be to thank a large number of individuals who are interested in mass education and innovations. But to the superintendents of the host schools who made many of the arrangements--Bob Muhs at Towner, Everett Knudsvig at Garrison, Jim Flaagan at Central Valley, and Perley Draffehn at Midway--our thanks. And to Al Rudisill, Glen Earthman, Bob King and Jim Ford, our appreciation for their role as consultants and speakers.

A. W. Sturges, Executive Secretary
UMSSP



* WORKSHOP CENTERS

. SCHOOLS REPRESENTED

Θ UMSSP SCHOOLS

INNOVATIONS FOR INSTRUCTIONAL IMPROVEMENT--THE STORY OF THE UMSSP

A. W. Sturges
Executive Secretary
UMSSP

During the four-week interval in the summer of 1963, a group of superintendents met at the University of North Dakota in a special workshop that was concerned with the problems of small schools. During that four weeks a number of innovations being incorporated in other parts of the country were examined and attempts were made to relate those methods of incorporation to the partial solution of the problems in a rural area in this area. At the conclusion of that workshop the superintendents agreed for the school year 1964-65 to incorporate as many of the changes as possible. During the next summer session another group of superintendents met in a four-week workshop whose purpose was to again attempt to search for ways to facilitate incorporation of change. This second group of superintendents at the conclusion of the four-week workshop teamed together with those superintendents which had attended the first workshop and had attempted to make changes during the previous year to form an organization known as the Upper Midwest Small Schools Project. It was then an organization voluntarily bound together whose membership required one staff member that had attended a four-week workshop and whose school would contribute to the functioning of the organization in a financial manner. The third summer workshop held during the summer of 1966 followed a similar general pattern of purpose and added some additional member schools to the organization.

The UMSSP is now composed of 15 member schools in North Dakota and Montana, governed by a five-man team that includes the representatives of member schools,

a member of the State Department of Instruction, and a member of the University of North Dakota. The executive Secretary of the organization functions as a coordinator and a non-voting member of the Board. Membership fees have been established at 25¢ per pupil with a minimum of $75.00 and a maximum of $175.00 per school. Board action is required for the addition of any schools to the organization. Current intentions of the Board are that membership will remain at the present level.

During the spring semester of 1960 the Fund for the Advancement of Education gave to the UMSSP a travel grant for the purpose of identifying innovative practices currently being employed in small schools in other parts of the country and to search for ways those innovations can be incorporated as a partial solution of the problems facing small schools in rural areas in the Upper Midwest. A total of 37 schools were selected for visits in 15 different states. During the visits made by superintendents of member schools and the State Department representative and other individuals, a great amount of information was assembled. More particularly the organization and current operation were examined through visits to the Catskill Area Project, the Texas Small Schools Project, and the Western States Small Schools Project. Some additional schools were also visited that were not members of the preceding projects. The member schools of the UMSSP have made rather extensive use of the collected slides, particularly in workshops aimed primarily at an informational level for superintendents and teachers. In addition, the dissemination of this information has been attempted through some newsletters and circulating materials.

Repeatedly, superintendents and teachers in member schools have emphasized the need for additional information about these innovations by teachers. Con-

siderable concern has been exhibited for some time with this problem. These series of workshops have as their purpose an attempt to present to teachers in project schools some ways other teachers are attempting to individualize instruction.

There are as many ways to innovate as there are creative teachers. It has been found that innovations develop through a teacher's attempt to solve a particular problem. More often, these innovations are developed because of a very strong-felt need and ordinarily do not exhibit a considerable amount of pre-planning. Although every good teacher has been attempting to individualize instruction for some time and although American education has from its conception attempted to meet the needs of its students, we have often failed in our task because of the amount of content to be covered, the diversity of abilities and interests in the students, the wide difference of preparations of the teachers, and the extremely limited financial resources available to most teachers. In small schools, resource people to whom teachers can turn are ordinarily not available. The following slides[1] illustrate the number of and kind of innovations available to the teachers.

Although it is extremely difficult and rather arbitrary to attempt grouping when we are talking about innovations, we have grouped the following kinds into 12 areas for ease of description. They are:

1. Multiple classes
2. Team teaching
3. The use of teachers' aides
4. Shared services
5. Modifying existing facilities

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[1]A series of 65 slides illustrating innovations were presented.

6. The use of programmed materials
7. Flexible scheduling
8. The use of special materials
9. In-service training
10. The use of non-grading procedures
11. Incorporation of recent technological developments
12. Employment of curricular changes

Rather arbitrarily, there are some of these we can classify as teacher-centered and some that are administrator-centered. The first six can be classified as teacher-centered; that is, teacher or a group of teachers can employ these types of innovative activities without official superintendent or board action and without extensive outlay of money and extensive involvement of students and other teachers. Let us look very briefly at these innovations:

FIRST, MULTIPLE CLASS:

The multiple class situation is one in which more than one subject is being offered at the same time by the same teacher. General agreement seems to indicate that the teacher should voluntarily accept such an arrangement, should have a reduced load to permit time for the increased amount of preparation, the subject should be in the same subject area (such as Home Ec. I and Home Ec. II) and the teacher should not have more than one period of multiple classes per day each year.

Use of multiple classes is primarily to increase the number of course offerings available to students. The major disadvantage is the lack of special assistance and preparation time that is available to the teacher but is extremely important. The amount of material necessary is concentrated from several periods into one because a number of classes are concentrated into a one-period interval.

NUMBER TWO, TEAM TEACHING:

This can be defined as a teaching technique by which a group of teachers cooperate formally or informally in the planning, preparing, teaching, and evaluation of the instruction of program for a large group of students. A team approach infers cooperative group action in the selection of content, presentation of the content, and the evaluation of the presentations, and the learning of the students. It also infers that the team is in the classroom at the same time. Formalized team teaching does not mean only a sharing of ideas among teachers with teachers "guest lecturing" in a class.

In small schools there is usually limited opportunity for team teaching to be incorporated in its purest sense. Small schools can, however, use the idea incorporated in team teaching in which more than one teacher works with others in the planning, preparing, teaching and evaluating of a specific unit or block of information to be presented.

NUMBER THREE, TEACHERS' AIDES:

The use of non-teaching personnel as teachers' aides is an extremely popular way in many parts of the country to free teachers to fulfill those creative methods in which they are particularly well-versed and at the same time freeing them from the rather routine, mundane administrative duties to which they are often subjected. As in many other techniques for improvement, a uniform definition of an aide's duties is not available; however, typical duties are attendance accounting, lunch supervision, secretarial duties of duplicating, distributing, recording and filing materials, distributing AV equipment for use by the teacher and assisting in the distribution of library material. These teachers' aides are often found in the communities, are given an in-service program by the employing school and are hired by the hour. Their

specific duties are determined by their capabilities and background, but they are neither certified nor do they teach in any way.

NUMBER FOUR, SHARED SERVICES:

The employment of a teacher by more than one school system in either an instructional or non-instructional position can be referred to as shared services. Shared services enables small schools to have access to a staff seldom found in other than the very largest schools. Administrative costs of the program usually are shared among member schools determined by the ability of the school system to pay and the amount of time this instructor spends in a particular school system.

This procedure seems to be an excellent technique to augment the staff of a small school. The major disadvantage is the amount of traveling often required of a shared service teacher in a rural area. The use of shared services was found particularly in New York area and to a lesser degree in Texas.

NUMBER FIVE, MODIFICATION OF FACILITIES:

Considerable ingenuity in teachers' modifying facilities is visible in almost any small school. These include construction of carrels from tables and peg boards, building mobile carts for tape recorders and storage and remodeling two small rooms into a large multiple-purpose laboratory that is illustrated by the slides. Generally, it was found that those teachers working in older buildings had more freedom to modify facilities than those teachers in newer buildings. A usual frame of reference was that in a small building a teacher entering the school with a two-by-four and a hammer could only improve an old building; entering a new building with sand paper would probably require Board approval.

In many instances the modification shown by the slides was fairly simple, yet a supporting superintendent and school board approved the teachers' attempts. Currently a teacher must be able to implement his ideas into some positive action and at the same time be willing to admit less than perfect reaction at the first attempt and a willingness to continue to search for improved facilities.

NUMBER SIX, PROGRAMMED MATERIALS:

Use of programmed materials used in many schools to augment existing programs are found in a supplementary role and very seldom, if ever, as a replacement to a teacher. Again, the basic purpose was to individualize instruction. Using programmed material, a teacher could permit a student to progress at his own rate with less immediate supervision; or, while those students that needed additional teacher assistance could receive such help.

In many instances the use of programmed materials was found within a classroom for specific subjects in which the student received assistance and encouragement from a teacher in the particular subject area, rather than having students work independently at their own leisure.

NUMBER SEVEN, FLEXIBLE SCHEDULING:

Probably no other part of the school administrator's program restricts the learning of students and the creativity of teachers than does the schedule. Existing schedules found in most schools could be referred to as the "Pavlov Schedule" in which both students and teachers are conditioned by bell ringing to learn, rest, eat, play, be quiet and go home. Many teachers are so conditioned to the sound of the bell that they almost automatically begin talking when they first hear a bell and quit talking when another bell is rung. Wherever creative and enthusiastic teachers are found attempts are being made to remove these restrictions of the schedule and still meet accrediting require-

ments. Floating periods, rotating schedules, periods of varying length are all probably the most popular methods being employed and are being found now in the Upper Midwest. A few schools are exploring modular scheduling which markedly increases the flexibility of the program, but also requires so many decisions that in many instances the computer is considered necessary in the scheduling. Later today Mr. Bob King of Meeker, Colorado, will be speaking to you by amplified telephone. At that time he will refer to Meeker's use of the modular schedule and its reception by students and teachers.

There seems to be no shortage of printed information explaining and describing new methods of scheduling; the popularity of this subject is attested to by the popularity of the topic at almost any principal meeting. This is an administrative technique, and will require the special assistance of the superintendent and principal. Teachers must be most sympathetic in recognizing that there is no single magic schedule that will meet all of their needs. The identification and development of a schedule most suitable for a particular school will have to be the joint efforts of the entire staff. Assistance to your school is available in increasing the flexibility of a schedule. A point of caution: Its purpose is to improve instruction and to increase the individualizing of the program; its purpose is not to allow schools to operate on a more limited budget or with less staff. Generally improved instructional programs cost more money. Similarly a better job of teaching requires more work on the part of the teacher.

Both the State Department of Instruction and accrediting agencies have agreed to permit experimentation on increased flexibility of the schedule without jeopardizing your school's accredited stand.

NUMBER EIGHT, SPECIAL MATERIALS:

There is almost an unending array of special curricular materials which have been developed or adapted to school use, available to the classroom teacher. In many instances these materials are available directly to the teacher and can be developed by the teacher. However, extensive developments will require additional financial outlays on the part of the school district. Generally wholesale acceptance of any printed material is not found by teachers; in other words, in each school system each teacher adapts or develops materials to fit the needs and situations of a particular classroom.

The use of special materials seems to be a tangible evidence of a teacher's search for improved methods of teaching, and generally financial assistance to teachers in preparing materials seems to encourage them to try new methods and different content.

NUMBER NINE, IN-SERVICE TRAINING:

With the rapidly expanding curricular programs and available materials, continual in-service programs are essential for teachers. As Dr. Clark, an economist at Teachers' College, Columbia University has indicated there is no such thing anymore as graduation. Teachers and all adults will continue in an educational program from birth to death. It is essential that teachers be kept up to date and accept for themselves the responsibility for this up-dating.

A major characteristic of some of the more creative activities in schools is exhibited by the amount of interest on the part of teachers in in-service programs. In effect, the teachers themselves have accepted the responsibility for developing in-service programs and continuing them. It requires an aggressive administrator and Board support, however, in the initial scheduling of

time, facilities, and moral support.

NUMBER TEN, NON-GRADING PROCEDURES:

A surprising number of teachers are attempting to vary the conventional administrative organizational patterns (non-grade) within a school system. Formal acceptance of a non-grading program will require superintendents and school boards and communities support. However, any teacher can use the principle of non-grading. Non-grading can appear in the form of several English classes, grades 10 - 12, being held in the same room with a number of teachers and aides with each student's program individualized through the use of commercially and teacher-prepared materials. It can be found in classrooms where a group of elementary students follow in their own books while listening to a tape recording of a story being read or using tapes for individual spelling programs while other students are working individually or in small groups in the same subject area.

It is possible that nomenclature often gets in the way of trying new teaching techniques. Sometimes the inability of leaders to agree on a definition for a popular new term acts as a deterrent to change. Remember, however, every teacher that attempts to individualize will non-grade.

NUMBER ELEVEN, TECHNOLOGICAL DEVELOPMENTS:

An awe-inspiring, almost overwhelming selection of equipment is available to the teachers. Many of the most recent technological developments are at the present time not available to teachers in small schools because of cost factors. However, the principles that are developed are applicable. For example, a rather large school system has in its AV Department an AV coordinator, the resources of an educational psychologist, and a commercial artist to assist teachers in translating their ideas for a transparency to a finished product.

The final product is an exceptionally fine presentation that is psychologically and aesthetically prepared. Another school has overhead transparencies made by the teachers using ink pens drawing on exposed x-ray plates purchased at a penny apiece and projected on screens found in every classroom made from pressed paper and framed by the janitor. The principle is the same--the use of the overhead to present information; the techniques might be a little bit different. Another illustration: There are in some larger schools acoustical treatments that can be mounted on the wall and adjusted by the music teacher electrically. For example, when the acoustics are not right, a flip of the switch can bring up or down the various widths of carpet-like material that will adjust the echo of the room to the satisfaction of the instructor. A small school in Texas as illustrated by this slide shows egg crate partitions nailed on the wall. When the teacher is not receiving the kind of balance he prefers, he merely asks the students to bring more egg crate partitions. Again, the principle is the same, the technique might vary a little. A number of illustrations are available to show this.

One of the most extensive uses of technological development falls into two categories: first, tape recorders. Tape recorders can be used from the first grade through the twelfth at every grade level and for a variety of uses. Slides showing some of the uses at Meeker, Colorado, particularly in non-grading spelling tests and recording speeches and commentaries for social science classes are particularly popular. A second kind of equipment is the amplified telephone. As used in these workshops it can be seen that it is an extremely inexpensive way to bring in outside speakers. In effect, your classrooms need not any more be confined to its four walls or its own town. Long-distance calls are rather inexpensive. Certainly the amplified telephone can be used very extensively by

asking resource persons such as the local medical doctor or lawyer or businessman or banker in your own community to speak to your classes. Each of your schools have pamphlets describing this technique and some typical costs. Each of the centers where these workshops are being held have amplified telephones; I know several additional schools are having them installed.

NUMBER TWELVE, CURRICULAR CHANGES:

The mushrooming of knowledge has in many instances frightened teachers from incorporating some of the recent curricular changes. Very often teachers feel that additional preparation on their part is necessary before the incorporation can be implemented. Most effective techniques are workshops such as this, in which teachers are given an opportunity of working with specialists in various subject areas and assisting them to make the transition from older programs to newer curricular programs. In Towner, North Dakota, the use of cuisinaire rods in the primary grades is one example. In many of your schools the attempt to use PSSC in physics is again an extremely popular method of incorporating curricular changes.

SUMMARY

You have seen about 65 slides, have had a lot of illustrations showing innovations--some of then are new, some of them are old. Every time an idea is presented you can look at it two different ways. Each of you can give me a long list of reasons why it cannot be incorporated--it is too expensive, students won't accept it, the school board is too conservative, the state department won't approve it, the University won't accept credits, and students are not taught this way, etc. None of these reasons, I feel, are valid. You

can look at any of these innovations another way and ask yourself, "How can they be incorporated in my classroom?" It is, of course, suggested that you look at these innovations in this light. Visiting the most exciting, largest, most dramatic school in the country can either be frightening and frustrating or exciting, depending on your own outlook. The classroom teacher that watched the AV Department that had the commercial artist, an AV director, and an educational psychologist and returned home to find exposed x-ray plates and the use of an ink pen was the kind of teacher that we're looking for--that can see ideas that can be implemented in his classroom.

Assistance now is not around the corner; it's here for you. All UMSSP teachers are given a bibliography of materials available to them. Also provided are names of teachers to whom they can phone or write for additional information. Any UMSSP superintendent or we at the University will do everything in our power to put you in touch with a person who can assist you.

Today's educational program is the most comprehensive, most rapidly changing, and most exciting educational program in the history of mankind. American education is leading the world in incorporating these changes and taking the "knife edge" of leadership. We are all very fortunate to be members of this great organization. We hope this day's activities will be of value to you and will stimulate some questions in your mind.

WORKING WITH THE INDIVIDUAL

Alvin E. Rudisill
Chairman, Department of Industrial Arts
University of North Dakota

Educators are currently working at a frantic pace to design and develop equipment, materials, techniques and programs which will individualize instruction so that every student at all levels will be able to learn at a rate relative to his ability, interests and needs. Almost all the new developments in education including programmed learning, flexible scheduling, non-grading and team teaching emphasize individualized instruction which provides for individual differences and abilities.

EMPHASIS ON THE INDIVIDUAL

This emphasis on the individual in our democracy is not something that has developed since the post-Spudnik era but was prominent in the thinking of the men who laid the foundation of our country. In the book entitled Goals for Americans, which is a report of the President's Commission on National Goals, the opening paragraph in the introduction states that "...the paramount goal of the United States was set long ago. It is to guard the rights of the individual, to ensure his development and to enlarge his opportunity. It is set forth in the Declaration of Independence drafted by Thomas Jefferson and adopted by the Continental Congress on July 4, 1776."

In this same book in the chapter covering national goals for education our responsibilities are more clearly spelled out:

Having committed ourselves to equality of opportunity, we may properly

> turn to the second principle - that each child should be dealt with in terms of his own abilities. Every child should have the benefit of an educational program designed to suit his capacities and to develop him to the limit of his potentialities - whatever that limit may be. None should be required to fit a pace and pattern of education designed for children of other capacities.
>
> In dealing with children of differing potentialities, we must remember that all are worthy of respect as human beings, all must know how to live and work together. They should never be handled in such a way that some youngsters appear to belong to an elite group while others are classified at a lower level . . . . to urge an adequate program for gifted youngsters is not to recommend favoritism. They do not need more attention than other children - in some situations they may need even less. They need a different kind of attention.

It should be obvious to all educators that we must eliminate class standards and begin to establish individualized standards which more closely relate to the ability and capability level for each student. It doesn't make much sense to reward a low academic ability student with a low grade because his rank on a given test is at the bottom of the class when it is possible that he is developing and learning at a rate very close to his capability level.

Tremendous strides have been made in recent years in the development of innovative materials, techniques and teaching methods designed to individualize instruction, but many educational programs as well as individual teachers are having an extremely difficult time breaking away from traditional subject matter content and teaching methods. Every teacher should read Stephen M. Corey's "The Poor Scholar's Soliloquy" at least once a month to remind us that every class is made up of individuals each of whom have unique interests and needs as well as varying capabilities relating to the academic ability rate of learning. This treatise on educational philosophy is amusingly written but I'm sure will cause each of you to reconsider your own classroom technique:

No, I'm not very good in school. This is my second year in the seventh

grade, and I'm bigger and taller than the other kids. They like me all right, though, even if I don't say much in the classroom, because outside I can tell them how to do a lot of things. They tag me around and that sort of makes up for what goes on in school.

I don't know why the teachers don't like me. They never have very much. Seems like they don't think you know anything unless they can name the book it comes out of. I've got a lot of books in my room at home - books like POPULAR SCIENCE, MECHANICAL ENCYCLOPEDIA, and the Sear's and Ward's catalogs - but I don't very often just sit down and read them through like they make me do in school. I use my books when I want to find something out, like whenever Mom buys anything second-hand I look it up in the Sear's or Ward's first and tell her if she's getting stung or not. I can use the index in a hurry.

In school, though, we've got to learn whatever is in the book and I just can't memorize the stuff. Last year I stayed after school every night for two weeks trying to learn the names of the Presidents. Of course I know some of them like Washington and Jefferson and Lincoln, but there must have been thirty altogether, and I never did get them straight.

I'm not too sorry though, because the kids who learned the Presidents had to turn right around and learn the Vice Presidents. I am taking the seventh grade over, but our teacher this year isn't so interested in the names of the Presidents. She has us trying to learn the names of all the great American inventors.

I guess I just can't remember names in history. Anyway, this year I've been trying to learn about trucks because my uncle owns three and he says I can drive one when I'm sixteen. I already know the horse-power and number of forward and backward speeds of twenty-six American trucks, some of them Diesels, and I can spot each make a long way off. It's funny how the Diesel works. I started to tell my teacher about it last Wednesday in science class when the pump we were using to make a vacuum in a bell jar got hot, but she didn't see what a Diesel engine had to do with our experiment on air pressure so I just kept still. The kids seemed interested though. I took four of them to my uncle's garage after school and we saw the mechanic, Gus, tear a big Diesel truck down. Boy, does he know his stuff!

I'm not very good in geography either. They call it economic geography this year. We've been studying the imports and exports of Chile all week, but I couldn't tell you what they are. Maybe the reason is I had to miss school yesterday because my uncle took me and his big trailer truck down state about 200 miles, and we brought almost 10 tons of stock to the Chicago market.

He had told me where we were going, and I had to figure out the highway to take and also the mileage. He didn't do anything but drive and turn where I told him to. Was that fun! I sat with a map in my lap

and told him to turn south, or southeast, or some other direction. We made seven stops and drove over 500 miles round trip. I'm figuring now what his oil cost and also the wear and tear on the truck - he called it depreciation - so we'll know how much we made.

I even write out all the bills and send letters to the farmers about what their pigs and beef cattle brought at the stockyards. I only made three mistakes in 17 letters last time, my aunt said - all commas. She's been through high school and reads them over. I wish I could write school themes that way. The last one I had to write was on "What a Daffodil Thinks of Spring", and I just couldn't get going.

I don't do very well in school in arithmetic either, seems I just can't keep my mind on the problems. We had one the other day like this:

"If a 57 foot telephone pole falls across a cement highway so that 17 3/6 feet extends from one side and 14 9/17 feet from the other, how wide is the highway?"

That seemed to me like an awfully silly way to get the width of a highway. I didn't even try to answer it because it didn't say whether the pole had fallen straight across or not.

Even in shop I don't get good grades. All of us kids made a broom holder and a book-end this term, and mine were sloppy. I just couldn't get interested. Mom doesn't use a broom anymore with her new vacuum cleaner, and all our books are in a bookcase with glass doors in the parlor. Anyway, I wanted to make an end gate for my uncle's trailer, but the shop teacher said that meant using metal and wood both, and I'd have to learn how to work with wood first. I didn't see why, but I kept still and made a tie rack at school and the tail gate after school at my uncle's garage. He said I saved him ten dollars.

Civics is hard for me, too. I've been staying after school trying to learn the "Articles of Confederation" for almost a week because the teacher said we could not be good citizens unless we did. I really tried because I want to be a good citizen. I did hate to stay after school, though, because a bunch of us boys from the south end of town have been cleaning up the old lot across from Taylor's Machine Shop to make a playground out of it for the little kids from the Methodist home. I made the jungle gym from old pipe, and guys made me Grand Mogul to keep the playground going. We raised enough money collecting scrap this month to build a wire fence clear around the lot.

Dad says I can quit school when I am fifteen, and I am sort of anxious to because there are a lot of things I want to learn how to do, and as my uncle says, I'm not getting any younger.

Ladies and gentlemen, the one thing we are sure of in education today is that it is becoming an almost impossible task to keep up-to-date. If any educator tells

you that we are keeping up-to-date, he is not only fooling you, but himself as well.

EXPLOSIONS NOW OCCURING IN SOCIETY

There are a number of explosions now occuring in society which are having, and will continue to have, a drastic effect on education. I am calling them explosions because when historians look back on this period of history these events will appear almost vertical in any graphic scale depicting the historical scene.

The first explosion I would like to discuss is the explosion of knowledge. Man has been on this earth approximately a million years and scientists tell us that we have added as much scientific and technical knowledge in the last one thousand years as in all the previous history of mankind. They further state that in the last one hundred years we have added as much knowledge as in the last one thousand, and in the last ten years we have added as much as in the last one hundred. Now the experts tell us that every eight to ten years we will double the amount of scientific and technical knowledge available to the human mind. Have we doubled the amount of knowledge we have been teaching in the last ten years? Are we going to double the amount of knowledge being covered in the next ten years and every ten years thereafter? There are going to have to be some drastic changes made in the methods and techniques being utilized in education today and everyone who is knowledgable about our present limitations in education will have to admit that we don't have the answers. The old method of teaching by repetition and memcrizing (which is still being utilized almost exclusively at all levels of education) is simply not going to be adequate; it is not adequate now and it has been outdated for several years.

Coupled with the knowledge explosion is the population explosion which is presently causing problems in many geographic areas and in the near future will be a universal problem in all geographic areas at all levels of education. It has taken man approximately a million years to reach our present population level and we are told that in only forty-two years our total population count will double. Dr. Werner Von Braun, in speaking before a congressional committee recently said:

> that at the current population growth rate, the earth's surface could not possibly provide room for all people in 500 years. A mere moment in the million or so years that man has inhabited the earth, current estimates are that by 1975 the United States will add to its population more people than are now living in England and Canada combined. . . . . From the time you went to bed last night until you arose this morning, the world population grew by 130 thousand people, an increase of 16 people per second. Two-thirds of all the people that ever lived are alive today.

The country of India alone is increasing its total population by one million people per month. Just think about the problems that are going to face education in general in the next few years and especially the programs in areas such as industrial arts, home economics, science and vocational education which are essentially laboratory programs where teaching to large groups is almost impossible.

Another explosion now occuring, which is the result of the knowledge explosion and the marriage between science and industry, is the technological explosion. In a research report recently released by the Minnesota Mining and Manufacturing Company, it stated that . . ."ninety % of the profits of the 3M Company in 1962 were on products that were completely unknown in 1960." In other words, in two years this company not only discovered, designed and developed new products but manufactured and distributed them so that 90% of their products over the two year period were on completely new products unknown two

years before. Now, how would you train people to work for the 3M Company when they are working on entirely new things before you can train someone in a two-year vocational program? The U.S. Department of Labor recently stated that over 1/2 of the people working in the year 2000 will be engaged in jobs that are completely unknown today; we have no idea what form these jobs will take and the children you have in your classes today will be the labor force for these jobs. Peter F. Drucker stated in a recent issue of Think magazine ". . . . that since we live in an age of innovation a practical education must prepare a man for work that does not yet exist and cannot yet be clearly defined."

Another explosion that we are experiencing might be termed or referred to as an explosion in the rate of change. Sylvia Porter in a recent editorial quoted from information released by the U.S. Department of Labor:

> If you are a student graduating from high school this year you can expect to make seven job changes during your working lifetime to maintain continuous employment. If you are a man twenty years old, you can expect to make more than six job changes during your working life and even at forty you can expect to make more than two job changes and at fifty one more job change.

These are average figures and certainly some of you will continue in the same job until you retire but some of the students graduating from high school last year might conceivably make as many as fifteen job changes during their working lifetime.

IMPLICATIONS FOR EDUCATION

Margaret Mead, the noted anthropologist who has done a considerable amount of writing regarding education, questions our entire concept of education and feels we should ask these crucial questions:

"Is our present idea of historic education suitable for people in the

> 20th century, who have a life expectancy of 70 years and who live in a world of automation and global communication ready to begin space exploration and aware of the possibility of bringing about the suicide of the entire human species? Is it not possible that the problems of the educational systems obsolescence goes beyond such issues as methods of teaching physics, or reading, or the most desirable age for leaving school, or the payment of teachers, or the length of summer holidays, or the number of years best devoted to college? Now these are problems and serious problems; but is not the break between the past and present, and so the whole problem of outdating in our educational system related to a change in the rate of change? For change has become so rapid that adjustment cannot be left to the next generation. Adults must not once, but continually take in, use and adjust to, and make innovations in a steady stream of discovery and new conditions. It is not possible that an educational system was designed to teach what was known to little children and to a selected few young men may not fit a world in which the most factors in everyone's lives are those things that are not yet but soon will be known?"

She further states that " . . . in today's world, no one can complete an education. We must create an educational system in which all individuals will be assured of the secondary and higher education they want and can use anytime throughout their entire lives."

I was very impressed to learn that a school system in a small town in North Dakota was combining their library facilities with the city library. Adults and students will be able to utilize the library (which will be located in the school) during the day, as well as in the evening. The library is operated by the school librarian during the day and by the city librarian during the late afternoon and evening. By combining library materials and making more efficient utilization of staff, two relatively poor libraries were able to develop a good library which meets the needs of school students as well as adults.

Take a look at the vocational and technical programs in today's school system. Where are we placing our emphasis? In many instances it is at the junior and senior high school and in some of the vocational programs in our country the percentage of placement is as low as 3 to 4 percent. I am certain that vocational

education serves a purpose at the existing levels but what choices does a man 28 - 30 years old have if he loses his job because of technological advances? If he has a wife and family to support he certainly can't afford to go back to schools with high tuition costs. Generally, he has a choice of accepting a relatively unskilled job or going on unemployment and eventually accepting relief. We are placing all our vocational education apples in a basket which has a poor record of reaching the market and are doling out millions of dollars on unemployment and relief checks to people who would like to go back to school to learn a salable skill. We are going to have to think of education not as a grade 1 - 12 but as grade 1 - 12 plus anytime in a man's life when he needs it. Margaret Meade suggests " . . . that we should think of education as primary and secondary education. The primary education would be the general education for everyone at the beginning level and the secondary level would be available to anyone throughout their entire life because of the rapidity of change that is taking place."

Peter F. Drucker, in an article in a recent issue of Think magazine stated that:

> perhaps we face the greatest challenge to traditional education in respect to skills. It used to be that a man who had acquired a specific skill as a boy had learned what he needed to do the rest of his life. A skilled man was a man who had learned a traditional craft. Today, increasingly, craft skills as such become meaningless. In organizing the economic job as a process based on automation, that is on the systematic flow of information and material, skills that formed a cohesive whole, let us say that of the electrician, become parceled out among a great many pieces of work in a great many different places. Worse still, skills that were determined only yesterday may become obsolete overnight and new skills, not yet visible, may be required overnight. We may need, therefore, a change in the very idea of skill. Instead of being what one has learned, skill will have to become the capacity to learn; that is, to apply ideas regarding work to new tasks. We speak today of an I.Q., and mean thereby an intelligence quotient, the ability of a man to apply knowledge to new situations. We may have to develop an S.Q., a skill quotient, that measures the ability of a man to

> transfer experience from one kind of material and one set of tools to new materials and new tools."

Edgar Dale, the noted educational psychologist, suggests that we must identify and stress a particular type of education not only in industrial arts but in all other phases of education as well. He states:

> To educate for flexibility we must distinguish between training and education. To train is to emphasize fixed responses, to stress immediate goals which often have a low ceiling of possible growth. To educate, however, is to foster limitless growth, life long learning.

Stating it in simpler terms, we have to teach students how to think.

Another article appearing in Think magazine by John Gardner identifies where the emphasis in education should be placed. He states that:

> If we indoctrinate people in an elaborate set of fixed beliefs we are insuring their early obsolescence. The alternative is to develop skills and habits of mind which will be instruments of continuous change and growth on the part of the individual. Then we will have continuous renewal . . . . This suggests a standard in terms of which we may judge the effectiveness of all education, and so judged, much education today is monumentally ineffective.

GENERAL NEEDS OF ALL STUDENTS

In the book entitled Guide to Better Schools - Focus on Change, better known as the Trump Report, the general needs of all students are identified. The first need is that " . . . students need opportunity to develop individual responsibilities and the skills of independent study." What are the current pressures causing us to emphasize? Generally it's coverage of more knowledge with more students so that actually just the opposite is happening. Many of our courses are organized so that students not only are not provided with opportunity for independent study but are actually squelched in their attempts to be inquisitive, because as soon as the teacher covers one unit the pressure to cover more material causes him to move on to the next unit and additional material.

The second need as identified in the Trump Report is that " . . . Students need to learn the skills of effective discussion." They need to think and plan together and work as a group because this is what they are going to have to do the rest of their life. In the past we haven't allowed a great deal of time for students to become involved in discussions.

Tied to the need for effectual discussion is the need to acquire a far more complex talent " . . . the talent for effective human relations." Teachers are often critical of students for not having the ability to organize for effective learning, and yet, when these same students are turned loose on the football field at noon hour; how long does it take them to get organized to play ball? Yet, in the classroom under the supervision and guidance of a qualified teacher we are told that these same students lack the ability to organize and govern their own activity. I am not being critical of those of you in attendance at this workshop who are members of the Upper Midwest Small Schools Project, since it is probable that this group is doing the best job of teaching that is being done in North Dakota. It is those teachers who never attend conferences, who do not belong to their professional organizations, and who never do any reading in professional magazines or contribute in any way to local, state and national professional organizations that are a detriment to the progress at all levels of education.

The last general need as outlined in the Trump Report is that " . . .Students need satisfaction in learning." Since students are motivated in different ways and by different stimuli it should appear obvious that we need to utilize a great many different teaching methods and organizational techniques in our teaching.

IMPLEMENTING CHANGE

According to Ralph Tyler, Director of the Center for Advanced Study in the Behavioral Sciences at Stanford, California, " . . . We now know enough about the conditions which contribute to learning to double the productivity of the college years."

In other words, if we applied what we now know about the principles of learning in each and every classroom, we could double the productivity of the college years. We could teach a student twice as much in a four-year program or turn the same student out in two years with the same amount of ability that now takes four years to produce. Edgar Dale, commenting on the statement by Dr. Tyler, outlined some very common sense principles of learning that we can apply not only in other fields but in industrial arts as well:

1) "The clearer, nearer, more relevant the statement of desired outcomes the more effective the learning. In other words, if you can't see the target clearly the chances of hitting it are not good. Students must know what they are expected to learn." We in industrial arts are not doing this. There was a survey taken by an upper midwest college in which this question was asked of high school students enrolled in industrial arts, "what is the major purpose of industrial arts?" There were a number of choices which students could check; one of them was "to provide students with a knowledge of modern industry" which we claim as our major goal. One of the other choices was "to enable students to build useful projects." Over ninety percent of the students who answered that question checked the answer which stated that the major purpose was to "enable students to build useful projects." This is a little bit disheartening when students don't know exactly what they are supposed to get out of a program, but even more disheartening was the fact that this same

question was asked of industrial arts teachers and over 50% of the teachers responded with the same answer. Anyone that knows anything about mass production and the automation of today's industry knows that you can go downtown and buy products of better quality for less money than they can be made on an individual basis in a school shop. The building of projects is certainly not the major purpose of industrial arts and both teachers and students should be clearly aware of this.

2) "We learn what we practice. The most commonly practiced skill in school and college is memorizing for temporary learning and many students are highly proficient at it. We can't learn critical thinking, planning or problem solving without guided practice." The lights usually burn late during examination time at all colleges and universities and I sometimes wonder how much permanent learning is taking place. There is no question that many students will come up with a high percentage of correct responses because they have had practice in memorizing since the primary grades; but we now know there is little correlation between student's grades and later success in life. Dr. Eli Ginzberg, who headed a research team in New York made a survey of 342 graduate students in various fields who had won fellowships to Columbia University between 1944 and 1950. Ginzberg and his associates set out to learn how successful these 342 persons had become 14 years after they completed their fellowships. The discovery that shocked them was this:

> Those who had graduated with honors, who had won scolastic metals, who had been elected to Phi Beta Kappa, were more likely to be in the lower professional performers levels than in the top levels.

What does this mean? It could possibly mean that grades are based on examinations which reflect the ability of students to memorize but do not in any way reflect the practical performance levels of students.

3) Another common sense principle that Edgar Dale lists is that " . . .you must teach for transfer." We used to think in education that old learning would automatically transfer to new situations. We now know that in order for a student to become proficient in transferring knowledge from one situation to another he has to practice this transfer. I minored in mathematics at college, but as far as I am concerned, that math minor was a complete waste of time. Oh sure, I got good grades, because I memorized all the formulas and substituted in the correct numbers; but for some reason we never had time to apply these formulas to practical situations because we had to move on to the next chapter which contained more formulas. Thirty days after I had completed that math minor I had forgotten all the formulas because we were never taught how to transfer these formulas to practical situations.

4) "Learning is increased by a knowledge of results." We are learning more every day about the importance of giving students prompt, reinforcing feedback. The research work being done in the area of programmed learning has shown the importance of informing students immediately whether their response was right or wrong. Yet, everyday, teachers assign "busywork" in one form or another that is never returned to students. Research shows us that this type of time filling activity might be doing them more harm than good.

5) The next common sense principle is that " . . . there is a motivation factor in all learning. Nothing motivates like success. We learn when we are rewarded and we fail to learn when we are punished. What is rewarding to one student may not be rewarding to another. The two things that are the most important factors in motivation are teacher enthusiasm and peer group acceptance." We know now that praise and acceptance are better than punishment of any kind.

For those of you that took English at about the same time that I did, you will recall that when a student began writing themes the teacher would take the theme and with a red pencil, mark in all the corrections. If you were as poor in English as I was, your paper would come back with more red markings on it than the black pencil used to write the original theme. Good English teachers are now using an entirely different approach to teach writing. When the student writes a theme, the teacher will first point out those areas that the student did a good job in and praise him for these areas before criticizing one or two areas which could be improved. The student is then enthusiastic about trying again and on the next theme the teacher will again praise the student before criticizing another area. Motivation is extremely important to the success of the student and teachers in all areas could certainly increase the amount of praise passed on to individual students.

6) "Most people never reach their potential," is another common sense principle of learning. We now know that there is a very low correlation between mental ability and creativity. We are developing programs now (programmed instruction) that are designed so that every student may proceed at his own ability level. One student in the class may be covering material twice as fast as a student with lower academic ability. However, what are teachers doing with programmed instruction? This a quotation from a recent issue of Education - U.S.A. "Clichés of the classroom such as, "we teach children, not subjects," or "start the learning experience where the child is" may in fact promise more than is customarily delivered. A research report by Richard O. Carlson raises questions in the course of a study dealing with educational innovations. Carlson turned up some unexpected outcomes in one Allegheny County School System where programmed learning, was introduced. In a dramatic way, Carlson reports, programmed

instruction forces the school to stand face to face with the fact that students learn at widely varying rates. The idea is that each student proceeds at his own pace. He has his own program, but what happened in Allegheny County? The teachers devised a host of practices designed to keep students working at the same pace. They slow down the fast learners and the slow learners were permitted to work on their programs in the home as well as in the classroom. The net effect, says Carlson, was the reduction of the range of differences and achievement. All of this simply suggests that schools as we now know them are either unable or unwilling to accept something approximating total individualized instruction." In other words, teachers are having a very difficult time accepting the idea that every student should be able to learn at a rate of speed which matches his ability level as well as his individual interests and needs. We are still trying to keep students learning at the same pace and we have devised a number of techniques to ensure that this occurs.

7) " . . . . Learning must be organized for sequence and cumulative effect." In other words, there must be a logical structure to what we are teaching. Leading educators in all subject matter areas continually stress that we must begin teaching general theories and principles. However, everyday classroom teachers at all levels get bogged by emphasizing isolated facts and formulas before covering the general structure of knowledge in a given subject matter area.

THE INVISIBLE SCREEN BETWEEN THE TEACHER AND LEARNER

Many teachers do not realize that an invisible screen exists between every teacher and learner and that this screen will prevent learning from taking place unless we utilize innovative teaching techniques and individualize instruction. In the next few minutes I am going to dramatize how this screen prevents learning and briefly discuss each of the strands that make up the invisible screen.

Let's place the learner behind this screen and then illustrate how teacher utilizing traditional teaching methods (lecture method - rote memorization) in providing permanent learning. The typical teacher would enter the classroom with all the facts, figures and formulas that the student should learn. If this teacher is really trying to impress the class, he or she would probably carry in several books under one or both arms to quote from during the lecture. Let us substitute this basket for the books and assume that this basket contains all the facts, figures and knowledge with which the instructor is "filling up" the students. Typically, the traditional teacher would simply "throw" (basket of styrofoam letters thrown at learner through screen) this knowledge at the students in the class. Notice that the screen prevents much of the knowledge from reaching the learner.

Now let's remove and analyze each strand to determine just exactly what prevented learning from taking place:

1. SENSORY PERCEPTION - What do we know about sensory perception and the learners ability to retain the information studied? According to this study (overhead transparency) by Socony - Vacuum learners retain only about 10% of what they read and only 20% of what they hear. Since assignment of readings and the presentation of lectures are the two most widely utilized teaching methods we can assume that we are between 80% and 90% inefficient. Looking further down on the chart we see that learners retain 30% of what they see and 50% of what they see and hear. In other words, if we can visualize the ideas or situations, which we are trying to imprint as "visual images" in the students minds, we have a much greater chance of success. Next on the chart we see that students retain 70% of what they say as they talk and 90% of what they say as they do a thing.

In other words, the student must be involved in the learning situation if we are to provide permanent learning.

2. ABILITY - Traditional teaching methods did not allow for differences in ability levels of students. Higher academic ability students were slowed down to the average learning rate of the class while low academic ability students were pushed at a faster pace than they were capable of learning. We geared our pace to meet the requirements of the "average" student and all of us know that this student exists only in statistical fact sheets.

3. BACKGROUND - Every student in class, no matter what the subject matter content of the class, has a different background of knowledge and experience relating to the material being covered. We often talk about "starting a student where he is", but in actual practice the background of experiences of a particular student are never considered and very little is done to provide for individual differences in background experiences.

4. INTEREST - Classes are made up of students and each student has interests which are entirely different than the interests of other students. We must begin to provide a wider range of material within each class so that we have a better chance of providing material which will be of interest to individual students.

5. PERCEPTION - "We can teach anything to anybody if we present the material at a level that the learner will be able to understand", is an often quoted statement of educational leaders. Yet, how often do we reduce the level at which material is presented when part of a class fails to comprehend difficult material? I am afraid we usually give them "more-of-the-same".

6. ATTITUDE - If individuals in your class have a negative attitude toward the material being covered, you better spend some time attempting to improve this attitude or very little learning will take place. If just a little more time were spent clarifying the reasons for students being enrolled in a particular class it could mean the difference between a student resenting assignments and a positive attitude toward learning.

7. EMOTIONS - There are days when certain students in your classes are so emotionally involved with home, school or social activities that very little learning will take place even under the guidance of an excellent teacher. Since we are fully aware that this will and does occur, doesn't it seem reasonable that we should provide a means whereby these students could take up where they left off and "tuned" the teacher out because of emotional involvement in activities outside the classroom.

8. MATURITY - We know that very often the maturity level of a student has little to do with his academic ability level and so often we hear teachers state that a student is too imature to be in this or that grade. Even classes with completely normal children will have ranges in maturity level several grades above and below the average maturity level of the class.

9. MOTIVATION - I don't know exactly what to say about motivation because even though hundreds of books have been written about it, educational psychologists will admit that we have absolutely no idea why one student is motivated by grades or other stimuli while another student might have just the opposite reaction. We are now told that it is much better to determine what students interests and needs are and then provide materials and instructional content which are motivational without artificial stimuli.

Now if we present material to the learner after taking into consideration individual differences and utilizing contemporary knowledge relating to the principles of learning our chances of "hitting" the learner are considerably better. (Throw basket of styrofoam letters at learner after removing strands in screen.) Naturally, we can never completely eliminate the screen between the teacher and the learner but often we can reduce the size of the individual strands by considering individual differences.

At times today I might have sounded somewhat pessimistic about the present methods being utilized in education. However, I am extremely optimistic that teachers will begin to incorporate what we now know about the principles of learning into their classroom techniques and also begin to utilize the materials and equipment which have been and are being developed to assist in individualizing instruction. I am not so concerned about where we stand right now because as Oliver Wendell Holmes once stated, "I find the great thing in this world is not so much where we stand as in what direction we are moving." We are moving in education and will continue to move at a pace relative to the receptiveness of each individual teacher to innovation and change.

THE RISKS INVOLVED IN CHANGE

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Educators in small schools have the feeling that improvement of the instructional program is very difficult because of the smallness and isolation of their school. This isolation is perceived to be a barrier to effective communications concerning recent changes and innovations. Undoubtedly some educators in small schools believe their task of improvement is more difficult than other counterparts in large school systems. Granted, it is difficult to improve the educational program in a small school; however, the educator in the large city school system is faced with a similar difficulty to affect improvement. In other words, it is difficult to improve the educational program no matter what the size of the district or where it is located. This is because all change or improvement must eventually be reduced to the individual teacher and administrator within the school - whether it be large or small. The sources of impediment to change, however, may be somewhat different in a small school than in a large school.

All change or improvement in the educational program has to originate with some person whether this be teacher or administrator. A person attempting to improve the educational program is basically trying to affect some changes; and a person attempting change takes certain risks. These risks can be identified as: 1) personal risk, 2) professional risk, and 3) economic risk. In all situations involving change or improvement, these risks are operative

to varying degrees.

Human beings prefer the security of familiar surroundings, familiar faces, and familiar processes. A teacher feels quite confident in teaching reading the way that he can best do this. A teacher also feels confident operating with a familiar grouping pattern. To change a method of teaching or a grouping pattern presents a situation involving personal risk. The change is a tension-producing situation - there is uncertainty in the outcome of the success of this pattern of action. The teacher takes the chance of failure when he tries a new grouping pattern. The chance of failure is always present with any change. Even the introduction of a new textbook can present a tension-producing risk situation. In any event, whenever a person attempts to change his pattern of operation, he is always faced with this personal risk.

The second risk that can be identified is on the professional level. A teacher who changes his program takes a certain amount of professional risk. In other words, the teacher is putting his professional competence on the line by changing his program. The teacher could risk a loss of status with his peers if a new grouping pattern is tried and it does not succeed. In some instances, a teacher can take the risk of censure by his superior for changing too rapidly. This is also true of administrators who try to infuse change and innovation in an educational program of the school. A different scheduling pattern, for example, might bring a certain amount of criticism from the teaching staff. In addition, educators may risk community censure because of changes in programs.

Whenever educators try something different they are, in essence, saying,

"this is wnat my professional judgement says should be tried." If what is tried fails, their professional judgement is at ... scrutiny of others. Censure and/or loss of status may not always result, but the risk is always there.

The third risk (that of economic risk) perhaps applies more to superintendents than other educators. In the extreme, a teacher could run economic risks with his job by trying new and different approaches, but such instances are few and far between. I doubt that very many teachers have lost their jobs because of too much change, but I suspect the reverse is true. Superintendents seem to be more vulnerable on this level. There are a number of examples where a superintendent suffered the consequences of an economic risk by implementing change at what might have been too rapid a pace for the community.

The foregoing discussion is not intended to frighten any educator from attempting change and improvement in his programs. On the contrary, unless such risks are daily taken, education will not progress. The educational practices of today are the result of countless risks by many educators. A person can better cope with these tension-producing situations, however, if they are recognized. The zest of teaching, just as the zest of life, is in taking these daily risks. The degree to which a person is willing to take risks and subsequently change and improve the educational program depends, of course, upon the individual.

There are many changes, innovations, and improvements that can be made in every teacher's program. The degree to which change and innovations are incorporated into the program is related to the significance the teacher attaches to these innovations, and the degree of applicability to their situations. In other words, the more receptive a person is about any innovation or change, the more

likely the change will be incorporated into a program.

In addition to the above mentioned relevance, there are certain conditions which usually exist to varying degrees in order for improvement to take place. First of all, a teacher must know his field - whether it be first grade reading or high school biology - he should thoroughly know his field. This naturally implies a strong background in whatever a person is teaching. The second condition necessary for change and improvement is familiarity with trends in the field. What is happening in his teaching field? What are some of the new approaches to teaching in his field? This is a big problem for all educators because of the vast amount of technology and research that is produced daily. To be able to identify trends in the field in which one teaches means wide reading plus communication with sources of knowledge. The third condition for change and improvement is to be able to apply relevant changes or improvements to the particular situation in which the teacher finds himself. The more perceptive a person is, the better able he will be to incorporate changes because he will see the significance of an innovation for his particular field.

To list new ideas, new methodology, new technical devices, or new organizational schemes would be a substantial job. Any suggested ideas or innovations that I cou . make for your program would be unproductive. The only way new ideas will be implemented in your program is by your answering this question. - Is this suggestion, idea, or innovation relevant to my particular situation? When this question is answered in the affirmative, changes will accrue in the educational program.

RESUME OF TELE-DISCUSSIONS WITH UPPER MIDWEST SMALL SCHOOLS PROJECT

Robert King
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HOW ARE TAPE RECORDERS USED IN YOUR SCHOOLS?

The tape recorder is the most used single item of Audio-Visual equipment in our school. We have over seventy tape recorders for a staff of 36 teachers and we need more. Most of this use has arisen from our efforts toward individualization of the curriculum. Teachers have multiplied their presence by putting such things on tapes as: spelling tests and analyses; mathematics explanations, drills, and tests; speeches and discussions for social studies; vocabulary drills; grammar exercises; poems and short stories for literature; and dictation for shorthand. Most of these tapes have been teacher made, although we are always searching for commercial materials that we can fit into our curriculum.

A further use of the tape recorder has been for the playing of background music in our classrooms. Many teachers feel this aids in reducing interference between individuals and groups in an individualized laboratory structure.

HOW DO YOU GET YOUR BOARD OF EDUCATION TO PROVIDE MONEY FOR SO MANY ITEMS OF AUDIO-VISUAL EQUIPMENT?

First, teachers request equipment because of something they wish to do to improve their instruction. Without this request they will not be provided any equipment. Thus we have teachers with as many as six tape recorders, others with none.

Second, we try to have any new item of equipment used in a board meeting for some communication of the meeting so that board members will understand the use of the equipment.

Third, we have curricular presentations at each board meeting, and equipment and materials are used in these presentations.

DOESN'T A DISTRICT HAVE TO BE WEALTHY TO PROVIDE SUCH EQUIPMENT?

No, actually the new equipment portion of a school's expenditures is very small in relation to a total budget. Ours has never exceeded 3% of the total, and is now less than 2%. In truth schools can no longer afford not to be well equipped to do the job assigned them. But we do not emphasize equipment for equipment's sake. It is only of value in relation to a curricular need.

HOW DO YOU GET TEACHERS TO EXPERIMENT AND INNOVATE?

Teachers seem to have a great deal of creativity and imagination if given freedom and support. The support must be both moral and financial. When a teacher is ready to move in some direction that seems desirable, we try to encourage him and to get necessary materials, equipment, and help. Here it is a challenge for the administration to keep up with what the teachers are doing.

HOW IS FLEXIBLE SCHEDULING WORKING?

The fact that it is working encourages us. This is our second year of it in our high school. We have used the modular concept and have our schedule generated on a computer through the Stanford School Scheduling System. We use 22 twenty-minute modules per day. Curricularly it has been very successful, making possible many alternatives not possible or desirable in a traditional-schedule, such as portional credit classes and vocational experiences outside the school. In general teachers have been able to structure classes more effectively and in-class discipline has improved. On the other hand, student

control outside of the classroom has caused us more concern, mainly because there are more opportunities for a student to be in the wrong place than before.

DO STUDENTS HAVE MORE FREEDOM UNDER FLEXIBLE SCHEDULING?

This is strictly up to each school. Computer scheduling requires about 30 - 40% of non-scheduled time. In other words, only about 60 - 70% of a student's time on the average can be assigned to regular classes. A higher percentage increases the conflict ratio too much. During the 30 - 40% non-class time a student can be given any degree of freedom the school deems advisable. We gave building freedom last year. Others have tried campus freedom or town freedom. This year we are trying assignment to directed study rooms or the library during this time. We intend to work towards more freedom for individual students under this structure.

WHAT PROBLEMS HAVE RESULTED FROM YOUR INDIVIDUALIZATION EFFORTS?

We have noticed several, such as:

(1) Teachers and staff can easily become overworked in the initial effort to prepare materials and keep records for individual students;
(2) Some students can become overworked in the attempt to proceed faster in their work than is reasonable;
(3) Organization of materials becomes a more complex problem;
(4) Grading causes a great deal of concern.

None of the above problems have been insurmountable and none of them would justify not attempting to individualize the curriculum.

HOW CAN SMALL SCHOOLS IMPROVE?

I think the answer lies in adapting -- adapting our buildings, our materials, our curriculum, our staffing, our expectations to the realities of the range of students facing us and to the tremendous opportunities which are now humanly and technically possible. The small school is in the unique position of being able to move quickly toward utilizing these potentials.

THE CONTINUING PROGRAM

Each member school has been provided, for use during the 1966-67 school year, approximately 220 sheets of selected material for the preparation of overhead transparencies.

As teachers develop original transparencies for use in their classroom, these additional materials provide them with increased freedom to experiment. In addition, the assistance of a graphic arts specialist is available to all teachers. At the end of the 1966-67 school year, a committee of teachers in each member school will select examples of those transparencies which, in their opinion, are of particular interest to other teachers. These transparencies will be collected from each school and transmitted to the UMSSP offices, where they will be duplicated in sufficient number to provide each member school a complete set of those transparencies prepared by the teachers during the school year.

These, and other teacher prepared materials, will be used as part of the resources during the week-long workshop held during June, 1967, for UMSSP teachers.[1]

[1]Additional information on continuing activities of the UMSSP can be obtained by writing UMSSP, College of Education, University of North Dakota, Grand Forks 58201.