

# FOCUS ON EXCEPTIONAL CHILDREN

## EFFECTIVE USE OF MEDIA IN THE CLASSROOM

*Carolyn M. Smith<sup>1</sup>*

### SELECTION AND USE OF MEDIA BY THE CLASSROOM TEACHER

The term "media" as currently used encompasses both equipment and materials. In this paper an integrated approach to the subject will be taken to increase utility, meaningfulness, and application to the classroom.

Media ranges in complexity from real objects to computerization. The availability of hardware, commercial materials, and materials for production varies considerably from one teaching situation to another. Some schools have extensive holdings in equipment, but little material to use with it due to restrictions from funding sources. Lack of adequate time for developing purchasing lists and lack of knowledge of resources has also impaired the selection of appropriate materials. An assignment to "spend \$5,000 by Monday" is not unusual and leads to situations such as the school that purchased an expensive set of programs for the tachistoscope but did not have the machine.

Low usage of equipment is frequently attributable to lack of training in how to use it and what it can do. A teacher in the latter stages of her master's degree program who has had an overhead projector in her classroom for nearly two years recently remarked that she did not know she could make her own transparencies. Experience with inservice workshops indicates that this, unfortunately, is not an isolated case. Many teachers received their training prior to accessibility to much of our current technology. Few programs even now require an audio-visual course, and content in this area is frequently handled in an incidental manner or not at all.

It is not within the scope of the topic to provide detailed instructions regarding specific machines. The variety of types available and rapid technological changes limit even an audio-visual text. Firsthand experience with a manual, an experienced operator, and a machine produces the most effective operation. An experienced operator can provide emotional support for what to many is a traumatic undertaking and can expedite interpretation of the instructional manual. The manual fills in details, is available for future reference, and is not as likely to forget a point as an instructor.

Student operators should be trained and utilized both to save time and to actively involve them, but competence on the part of the teacher in handling equipment is essential for confidence and maximum benefits.

As access to various forms of media increases, the teacher has an important and difficult role in making appropriate selections and applications. Knowledge of the characteristics of the materials, equipment, and the individual learner is critical to prescribing a good match.

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Learning rate, modality strengths and weaknesses, interests, reading level, prerequisite skills, work habits and other variables may influence the success of the best material. Research has reinforced the observation that people learn in different ways. The frequent finding, in audio-visual research of a "combined" approach's superiority may be due to the opportunity it affords each subject to use his preferred style when modality strengths are not controlled (Smith, 1972). Studies on the Mill's Learning Methods Test lend some support to this hypothesis in that the visual, auditory, kinesthetic, and combined methods are each more effective for certain groups and individuals (Mills, 1964). Some children are distracted by a second or third

channel presentation. Tuning out distracting input may be a vital developmental adjustment to such children and should be assisted by the teacher when indicated.

Characteristics of media which should be considered are control of pace, opportunities for repetition at short intervals if needed, sensory modes, motion, color, dimensionality, reading requirements, cost, ease of use, appropriateness of material to needs and ability, and interest. Novelty effect may contribute to the latter so that rotation among schools of some types of equipment and/or programs may be desirable. Cost involves priorities, price as it relates to effectiveness, and alternatives. The self-pacing feature of machines is usually destroyed or limited by group use. Relevant characteristics of each media type will be discussed further in relation to suggested uses with the handicapped.

The effective use of media can offer flexibility in approach, individualization of instruction, and increased interest, attention and learning. Criticisms vary according to type and will be considered by categories; but generally cost, mechanical failures, lack of appropriate materials, and dehumanization are cited. Apparently there is fear of decreased interaction, but in actuality automating some aspects of instruction frees the teacher for the things only a person can do.

The selection process should include a detailed examination of both equipment and materials and inquiries to publishers, instructional materials centers, the literature, and users for research and evaluations. Inspection of materials can be made at materials centers, publishers' booths at professional meetings, other schools, and by "on approval" arrangements. Probably the best way to obtain a comprehensive view, however, is a short-term try out in the classroom. A network of national, regional, state, and associate instructional materials centers for the handicapped provides information and specimen sets that usually can be checked out for three to six weeks. The associate centers are being established within the state systems to put materials in easy reach of all teachers. Services vary in the centers so contact should be made with both national and regional centers (see Table 1). Centers for the blind and deaf offer services for the multihandicapped regardless of placement so a visually handicapped EMR may be eligible for free use of record players, tape recorders, talking books, three-dimensional models, and other such aids. Certification of eligibility is established through the state department of education. The regional office will supply addresses of state and associate centers as well as catalogs of holdings, bibliographies, and descriptions of services. Some hold workshops at their centers or in local school systems upon request. Most offer help in locating specific types of materials through guides such as

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I certify that the statements made by me above are correct and complete.  
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**Table 1**  
**SEIMC/RMC/NCEMMH NETWORK**

CENTER	SERVICES
Dr. Donald Erickson, Director CEC/ERIC and SEIMC/RMC/NCEMMH Network Office 1920 Association Drive Reston, Virginia 22091	National
Dr. Paul Andereck, Program Manager Bureau of Education for the Handicapped 400 Maryland Avenue Washington, D.C. 20202	National
Dr. John Belland, Director National Center on Educational Media and Materials for the Handicapped Ohio State University 220 West 12th Avenue Columbus, Ohio 43210	National
Mr. Carl Lappin, Director Instructional Materials Reference Center for Visually Handicapped Children American Printing House for the Blind 1839 Frankfort Avenue Louisville, Kentucky 40206	National
Dr. Raymond Wyman, Director Northeast Regional Media Center for the Deaf University of Massachusetts Amherst, Massachusetts 01033	Connecticut Delaware Washington, D.C. Maine Maryland Massachusetts New Jersey New York New Hampshire Pennsylvania Rhode Island Vermont
Dr. William Jackson, Director Southern Regional Media Center for the Deaf College of Education University of Tennessee Knoxville, Tennessee 39716	Alabama Arkansas Florida Georgia Kentucky Louisiana Mississippi North Carolina Ohio Puerto Rico South Carolina Virginia Virgin Islands West Virginia
Dr. Robert Stepp, Director Midwest Regional Media Center for the Deaf University of Nebraska Lincoln, Nebraska	Illinois Indiana Iowa Kansas Michigan Minnesota Missouri Nebraska North Dakota South Dakota Wisconsin
Dr. Hubert Summers, Director Southwest Regional Media Center for the Deaf New Mexico State University P.O. Box 3AW Las Cruces, New Mexico 88001	Alaska Arizona California Colorado Guam Hawaii Idaho Montana Nevada New Mexico Oklahoma Oregon Texas Trust Territory of the Pacific Islands Utah Washington Wyoming
Dr. Charles Watts, Director Special Education Instructional Materials Center University of Southern California 1031 South Broadway Los Angeles, California 90015	Arizona California Nevada
Dr. Leroy Aserlind, Director Special Education Instructional Materials Center University of Wisconsin 2605 Marsh Lane Madison, Wisconsin 53706	Minnesota Wisconsin

Mr. Albert Fall, Director Special Education Instructional Materials Center University of Texas at Austin 2613 Wichita Street Austin, Texas 78712		Arkansas Oklahoma Texas
Dr. Robert Carter, Director Special Education Instructional Materials Center George Washington University 2201 G Street NW Washington, D.C. 20006		Delaware Maryland New Jersey Pennsylvania Virginia Washington, D.C.
Dr. Wayne Lance, Director Special Education Instructional Materials Center University of Oregon Department of Special Education Clinical Services Building Eugene, Oregon 97403	Alaska American Samoa Guam Hawaii Idaho	Oregon Trust Territory of the Pacific Islands Washington
Dr. John Tringo, Director Special Education Instructional Materials Center Boston University 704 Commonwealth Avenue Boston, Massachusetts 02215	Connecticut Maine Massachusetts	New Hampshire Rhode Island Vermont
Mrs. Lou Alonso, Director Special Education Instructional Materials Center Michigan State University 213 Erickson East Lansing, Michigan 48823		Indiana Michigan Ohio
Dr. Robert Ridgeway, Director Special Education Instructional Materials Center University of Kansas 213 Bailey Street Lawrence, Kansas 66044	Iowa Kansas Missouri	Nebraska North Dakota South Dakota
Dr. Robert Starrett, Director Special Education Instructional Materials Center University of Kentucky Special Education Department 720 South Limestone Lexington, Kentucky 40506		Kentucky North Carolina Tennessee West Virginia
Miss Gloria Calovini, Director Special Education Instructional Materials Center Office of Superintendent of Public Instruction 1020 South Spring Street Springfield, Illinois 62706		Illinois
Dr. Willard Jones, Director Special Education Instructional Materials Center University of Northern Colorado Greeley, Colorado 80631	Colorado Montana New Mexico	Utah Wyoming
Mr. Raphael Simches, Director Special Education Instructional Materials Center New York State Education Department 55 Elk Street Albany, New York 12224		New York
Dr. Faye Brown, Director Southern States Cooperative Learning Resources System Auburn University at Montgomery 435 Bell Street Montgomery, Alabama 36104	Alabama Florida Georgia Louisiana	Mississippi Puerto Rico South Carolina Virgin Islands

Prescriptive Materials Retrieval System (1973), Media Analysis and Retrieval System (Rude, 1973), NICEM Indexes (1973), Learning Directory (1972), Behavior Resource Guide (Cawley, 1973), Guide to Free Curriculum Materials series (Suttles, 1972), or systems of their own. These enable a searcher to locate sources of material by media type, subject, grade level, reading level, interest range, and mental age. Most also tie into diagnostic tests and/or behavioral objectives.

Curriculum guides, texts in special education, elementary education, early childhood and vocational education, journals, and materials texts such as *Instructional Resources for Teachers of the Culturally Disadvantaged and Exceptional* (Anderson, Hemenway & Anderson, 1969) can also assist in the location of appropriate media.

## OBJECTS

On the continuum from concrete to abstract, manipulable objects should be the initial tools of instruction for all learners according to Piaget (Flavell, 1963). Concrete-ness is especially important for the retarded, slow learners, visually impaired, and deaf. The younger the child, the greater the need for experiences with real objects. Experiential deprivation due to disadvantaged backgrounds, physical handicaps, or overprotective parents sometimes necessitates provision of missed experiences. Field trips, unit instruction, object lessons, and learning centers especially utilize real objects and models.

Models are useful where an item is impossible or impractical to bring into the classroom and where the correct size and other concepts are firmly established. However, a good picture may be less misleading than a poor model. It is up to the teacher to determine whether all of her students are past the stage that a purple plastic cow would interfere with their conceptualization of "cow" and whether the object will contribute to their learning.

Manipulatives are particularly helpful in developing mathematical understandings. For this purpose the type of object does not matter, so many free and inexpensive items will do. They should be interesting to children and of appropriate size and shape for the intended use. Tongue depressors, for example, work well for group demonstrations, resemble a "1," can be placed in a pocket chart, and can be bundled together easily for place value instruction. Popsicle sticks likewise are good for at-the-desk use. Teacher manipulation of objects does not qualify; the student must do the manipulation. Fernald (1943) recommended "putting the problem on the table" with bean armies or other imaginative designations which supply interest to everyday objects. The addition of color may also help, especially when done by the students themselves.

Clothespins on a cord make a great number line. Stretched across the blackboard, numerals or problems can be written above or below them. Number cards may be inserted in the snap part, and they will slide easily to form groupings. A set composed of 100 of one color and 50 of another can be used to demonstrate counting by ones, twos, fives, and tens and also to introduce multiplication in a visible manner.

Egg cartons and small objects such as buttons, rocks, marbles, shells, and pieces of plastic straws can be used for tasks in classification, seriation, number concepts, matching, and reading labels.

Kits of objects may be assembled for a specific project or as tools of problem solving.

## GAMES

The social and motivational value of games make them popular with both students and teachers of special education. To use games to full advantage, however, requires more planning than is frequently the practice. Like other instructional materials, games should be selected for appropriateness of concepts, skills, and procedures to specific students.

Consideration should be given to the effect on future use when modifying a game to make it easier. Monopoly, for example, could be used in a primary class for simple identification of money, but since there are more appropriate alternatives available for that purpose, the loss of novelty and attachment of "baby" stigma may reduce later value.

The introduction of a new game should be carefully planned and supervised by the teacher to assure fair play and to avoid the practicing of errors. If verification is not built into the game, the teacher should devise a method for immediate feedback as to the correctness of responses.

Many excellent games are available commercially. Standard games the children will have access to in the home and neighborhood should be included, so the handicapped will have increased opportunities for success experiences in their family and peer interactions.

A number of games have been devised especially for children with learning problems. Characteristics of the better ones include durability, use of color, simple rules, response verification, and simultaneous control of content and procedures so that the reading requirements, for example, do not exceed the level of the learning task. Teacher-made games should observe these same principles. Children enjoy games they have helped make and might well make individual ones to take home for reinforcement.

Multi-use can be made of laminated, write-on game boards or several sets of cards used in conjunction with one



game board. Small cars, horses, dogs, etc. are especially appealing as the movers.

Toss games, card games, board games, and spinners are typically used, separately or in combination, to teach matching, labeling (naming or reading), and operations (adding, multiplying, making change).

## PICTURES

The pictorial (iconic) stage is the intermediary stage between the concrete (enactive) and the abstract (symbolic) in the classifications of both Piaget (Flavell, 1963) and Bruner (1966).

A picture file compiled from magazines, posters, newspapers, coloring books, and old workbooks according to topics and interest level of students is the least expensive in this category. Students like to assist in the selection, mounting, and categorizing of the pictures, an educational task in itself. The pictures should be of a size and mounting to facilitate storage.

Lamination protects a picture that will be receiving a great deal of handling. If a laminating or dry mount machine is not accessible, a type of laminating film which does not require machine application is now available or clear contact paper can be used. Plastic purchased by the yard is the least expensive and can be laminated with an iron if aluminum foil is placed under and over it. *Do not let the iron touch the plastic directly.* Waxed paper will work in basically the same manner to encase a picture. Art work can be enhanced by any of these methods for display or practical uses such as placemats. A reusable write-on worksheet can be created by lamination or by inserting a worksheet into a heavy plastic folder. Whatever the laminating technique, both sides should be treated or curling will result from differential moisture absorption. It is also wise to experiment a little before attempting to do a prized picture.

Pictures can be used as manipulatives by placing them on separate cards as Cawley does in his math program (1970; Soeffing, 1972). Green apples and red apples on cards arranged to demonstrate a problem probably do so as effectively as real apples. The crucial factor is being able to move the cards around so as to visualize the problem.

Photographs are an excellent way to attain realism. They are especially helpful in unit instruction for recording field trips or step-by-step procedures. Polaroid yields immediate feedback, which is highly motivating to the students and useful to the teacher in knowing whether to take another shot of the same thing.

## PROJECTION

Projected images are larger and sometimes better suited to group instruction than pictures. They are generally less expensive than large pictures. Use is limited to one picture at a time and access to the appropriate machine. Most require darkening of the room. Special shades, drapes, and blinds are available for this purpose. The dark is not necessarily a disadvantage as it may help to reduce distractions and focus attention.

Fans on projectors are to cool the lamps and prevent bulb breakage. Allow the fan to continue operation for several minutes after turning the machine off. Some models do this automatically. An extra bulb should be kept on hand as they usually go out during use. Care should be exercised in changing bulbs as the temperature is extremely high in that area of the machine. Sometimes it is more expeditious to change machines if another one is readily available. Easy access to the lamp area and pop-out bulbs are desirable features in selecting projectors.

Autoload models simplify the threading process but can chew up a film in short order if not stopped at the first odd sound. A pleated filmstrip is probably replaceable at about six dollars, but a rented or borrowed movie may be several hundred dollars. It is wise to check on responsibility regarding lost or damaged films when making loan arrangements. Threading of projectors is not complicated, and many media specialists advise purchase of conventional rather than automatic loading models. Beaded screens are recommended for best diffusion of light and clarity.

A checklist of necessary accessories should be prepared when using equipment for the first time to avoid delays such as searching for an extension cord or an adaptor to insert a three-pronged plug into a two-hole outlet, etc.

## Slides

Both slides and prints can be made from the same roll of film and camera. Prints made from slides may not be as high in quality as originals.

A slide projector or an adaptor for the filmstrip projector is required for projection. Handviewers may be used individually. Several machines are also now available with built-in screens for small group or individual use to synchronize slides with taped audio.

Since slides are more expensive to produce than filmstrips, not many commercial materials designed for the elementary schools are in slide form.

Slides are simple to produce. An instamatic or a 35 mm camera can be used. A copy stand equipped with a special lens can be used with an instamatic camera, Ektachrome X film, and flash bulbs for print and other close work. Most materials centers have these available for use on location.

Two sizes of layout are possible, approximately 3x5 and 8x10. All print should be primer size or larger to assure readability. Film, bulbs, and processing for an 80-picture tray cost about \$25 with school discounts. Mailers purchased with the film simplify the procedural aspect of processing.

A slide presentation is effective as reinforcement to students and in interpreting the special education program to parents, other teachers, administrators, and interested civic groups.

### Filmstrips

Filmstrips are inexpensive to purchase and are available in most school systems and in public libraries. Machines using them are simple to operate and can be handled by students after minimal training. Records or tapes accompany many filmstrips ranging from classic children's books to carefully sequenced instructional programs. Reading, phonics, handwriting, math, health, social studies, and science are topics appropriate to the special education curriculum. Adaptation of the level can be easily made by substituting orally a teacher-made script or informal comments for the written portion of the filmstrip. Meaningful use with the trainable retarded will almost always require some modification.

Pacing is within the control of the teacher and discussion can be conducted at pertinent points.

### Opaque Projection

The opaque projector is a bulky piece of equipment that has the disadvantages of requiring darkness and placement at some distance from the screen, which locates the operator behind the students. It is considered rather outmoded; but if one is gathering dust in a storage closet, it has unexploited potential and certain advantages.

The major advantage is that materials can be projected directly without preparing a reproduction. Books, pictures, workbooks, objects, students' papers and tests can be placed in the machine and projected without damaging the original copy in any way. For prolonged exposure a piece of heat resistant glass placed on the material will both hold it flat and protect it from the heat of the light. Some of the newer models have built-in heat protection and improved projection quality.

In teaching reading as a subject or other subjects through reading, a single copy of a book can be used—thus extending to group or whole class use a wider variety of supplementary books, library books, borrowed books, daily newspapers, children's newspapers, magazines, catalogues, directories, pamphlets, music books, and so on. The children need not handle them if damaging is feared, they

need not see grade labels, and they cannot be on the wrong page or looking ahead to find out how the story ends by the pictures.

The machine is equipped with an arrow to be used by the operator, or a rubber-tipped pointer can be used at the screen by the teacher or students to focus on the correct word and to emphasize the left-to-right reading movement. Reading in unison works well in conjunction with opaque presentation and involves active participation on the part of all the children, with no waiting turns and loss of attention. Questions can be geared to individual levels so that every child makes a contribution whether it be pointing out a detail in the picture, a single word, or whole sentence in response to a more complex question.

Many workbook lessons are suitable for presentation on the screen, and explanations of independent work or tests are simplified by an enlarged image for demonstration.

The opaque projector can also be used to project pictures upon a large sheet of white paper where the outlines can be traced by teacher or students for charts, posters or bulletin board cutouts. The writing for posters can be done on a lined sheet of paper and projected on the poster paper where it is easily and neatly traced. Tracing enlarged images encourages large muscle movement and develops hand-eye coordination. Formation of letters can be practiced in this manner and the size gradually reduced. With projected models the child has only to change sheets of paper and continue practicing.

### Overhead Projection

The overhead projector is lightweight, simple to operate, designed for use in the lighted classroom, and placed at the front of the room. It focuses attention on the lesson at hand and adds more visual stimuli, both of which are helpful to the handicapped student. Control of presentation is maximized by (1) the fact of its being out of the students' hands so they cannot play with it or turn pages looking ahead, (2) the on-off switch which removes the image entirely and switches attention back to the teacher, (3) masks which reveal only a selected portion at a time, (4) tachistoscopic presentation, using either an opaque cover or the on-off switch, (5) overlays which use one transparency on top of another to build from a simple to a more complex image, and (6) pointing with the finger or any opaque object.

Use of the overhead projector instead of the chalkboard not only eliminates chalkdust from the hands but permits the teacher to face the class at all times and to watch the faces of her students for indication of comprehension or lack of it. This is especially important in working with the retarded since it is frequently the only feedback the teacher gets, and in this way the exact point of confusion

may be located. Materials can be prepared ahead of time so that no class time is lost in putting it on the board. Transparencies are reusable and easy to store. They are also less expensive and quicker to prepare than duplicated copies.

There are numerous methods of preparing transparencies, details of which can be obtained from the directions accompanying specific machines and materials. Any page from a book, workbook, test or other material can be made into a transparency in four seconds with a copying machine such as Thermo-Fax. A special combination transparency and spirit master makes it possible to run a transparency along with duplicated copies on any spirit duplicator. Ready-made transparencies are available commercially in most subject areas, and these are usually accompanied by overlays and lesson suggestions. A less expensive method of utilizing commercially prepared materials for standard use is the purchase of transparency masters from which many transparencies can be made by a copying machine. It is also possible to make transparencies with sunlight, chemicals, and such simple techniques as grease pencils, special colored pencils, or felt markers. Colored pencils, felt markers, and colored transparent tape can be used to add color to transparencies. Color lift techniques using compressed acetate or an infrared copying machine (or a warm iron) make full-color transparencies from any clay-based color picture. Pictures from most top quality magazines are clay-based. They can be checked by moistening a finger slightly and rubbing a corner of the picture. If a white deposit comes off on the finger, the picture is clay-based. Color lift techniques destroy the original picture.

The silhouette technique employs cutouts, flannel board figures, or opaque objects to cast outlines onto the screen. A blank transparency placed under the objects will protect the stage of the projector from scratches. The use of manipulatives for projection is particularly applicable to math instruction where counting, verbal problems, and grouping can be graphically demonstrated and easily seen. Objects that students are using at their desks such as popsicle sticks, Cuisinaire rods, Stern blocks, and small counting frames may be projected.

Transparent manipulatives can be made by cutting apart pictures on a transparency. Small pictures can be Xeroxed, a transparency made from the Xeroxed copy by an Infrared Transparency Maker and then cut up. Coins can be made into transparent manipulatives in this manner. Bills may also be reproduced for educational purposes if a copying machine is utilized that reduces or enlarges the size by at least 25%. Money manipulatives are useful in visualizing word problems, making change, and demonstrating place value.

The Xerox process makes it possible to create transparencies from bound materials and to alter originals. The first Xeroxed copy can be cut up, rearranged, and a second Xeroxed copy made from which the infrared transparency is produced. The carbon content of a xeroxed copy frequently makes a better transparency than the original so this step might also be added for obtaining darker and clearer transparencies.

The masking technique combined with a rearranged transparency can provide a multi-use instructional material. Pictures of ten little Indians from a song sheet, arranged in a line and masked by a piece of cardboard could be used as a visual for any number zero through ten. It could also be used with pointing or masking to accompany the counting song for addition, subtraction, and counting by twos.

Movable parts can be attached to transparencies such as hands on a clock face, "mercury" for a thermometer, or a spinner for a write-on diagram for a game.

Transparent objects will project clearly if they have a flat top surface. This is a particularly helpful technique in teaching the use of rulers when a large image is needed, and distortion of size concepts is a concern. Attention should be called to the ruler being used periodically to emphasize the actual size. The numerals will not show if there is any curvature at all so it is crucial that a flat ruler be used.

Mounting transparencies in a cardboard frame provides a border for labeling and filing purposes. If all four edges of the transparency are taped to the underside of the frame, the transparency will lie flat and project without distortion. A plastic "tray" frame is available to keep unattached overlays aligned and flat.

Equipment for projecting transparencies includes the overhead projector, a screen (or white wall or board), and an extra bulb. The screen should be installed in a front corner of the room and as high as possible so that the line of vision is not blocked by the teacher. If the screen is not squared with the projector, keystoneing—a distorted pattern of projected light—will appear on the screen. The screen and/or projector can be installed at a slant to eliminate the keystone effect.

### Motion Pictures

Movies are highly motivating and realistic. Due to the expense involved, there are relatively few 16 mm films available specifically for elementary level instruction. Most state departments of education and health departments have film libraries and annotated catalogs of their holdings. Travel agencies sometimes have films suitable for enrichment purposes.

Scheduling films at the time needed is often a problem, especially such seasonal topics as holidays, fire prevention week, and historical commemorations.



A set of all basic reel sizes should be maintained as most film libraries are now requiring films to be returned without being rewound. The films are checked for damage while being rewound; and if directions to this effect are disregarded, loan service may be discontinued. Size of the take-up reel should be checked against the film to be shown prior to use so it will fit into the mailing box. Film will continue to run on a take-up reel that is too small for several inches; but when the machine is stopped, the excess falls off and creates a tedious task of hand-winding the excess.

The pace of films is so rapid that a second showing is frequently desirable.

It is a good idea to learn the parts of the motion picture projector as well as the step-by-step operational procedure so that, when malfunctions occur, the origin of the trouble can be located. Garbled sound, for example, frequently means that the film is not tight enough against the sound drum. Flicker of the picture may mean the loop needs to be restored. Knowledge of a few basic principles can facilitate learning to operate an unfamiliar machine. Even though projectors vary, becoming competent through practice with one type increases confidence, interest, and probability of use of others.

Eight millimeter movies can be produced with or without sound, depending on the sophistication of the equipment used. A compatible projector must be available. Most super eight projectors can be used for showing regular eight mm, but the old eights will not work for super eight film. Teachers who have their own home movie outfits sometimes use them at school, primarily for motivational purposes. Filming the Special Olympics, a talent show, or play greatly extends the benefits of such events.

Sound movie equipment is expensive and not as flexible as video tapes.

### Video Recordings

Video tapes afford simultaneous recording of sight and sound. They are practical for any instructional purpose requiring motion or evaluation of performance over time. The tape can be erased and reused. It can also be edited and spliced like film, which permits selectivity in portions to be retained.

The price tag for a full set of cameras and playback equipment can range from about \$1,200 to several thousand dollars. Some of the less expensive brands are more portable and yield better quality for teacher use because of the technical demands of the more intricate and expensive outfits. The cost of tape averages about \$25 per hour. There are several sizes of tape which are, unfortunately, not interchangeable. Purchasing or borrowing of video tapes requires identification by model and number.

Access to video taping equipment is becoming increasingly wide-spread due to its popularity for teacher training.

Educational television programs may be video taped and used when most appropriate and repeatedly as needed.

### AUDIO RECORDINGS

A wide variety of audio recording devices are on the market, ranging from records to components of complex systems for presentation of programmed instruction.

The record player and disc recordings are standard equipment in most elementary programs. A three-speed, simple to operate (non-automatic) player is recommended. For certain purposes a variable speed machine may be desirable. Records should be stored in vertical position in protective covers, and an extra needle should be kept on hand.

Reel to reel tape recorders are also generally available, although it may be on a check-out basis. For most effective use, a recorder should be continuously accessible. The sound quality of reel to reels has been considered an advantage over cassette players, but operation is somewhat more complicated.

Cassette players have improved in quality to such an extent that they are recommended for most classroom purposes. There is such a range of prices and quality available that care should be taken in selection to choose one that has sufficient clarity and volume for group use. Ease of operation should also be a consideration. Some brands have a green button to push for "play" and a red one for "stop," which facilitates use by young and/or handicapped students. Even teachers are annoyed by ambiguous markings and hard-to-reach volume dials on some brands. If different lessons are to be put on one tape, a number dial or markers over the tape will be helpful in locating the starting point. Separate cassettes for each lesson simplify handling by students, and many commercial programs have relatively little tape on each for this reason. The expense of such an approach for teacher-made tapes may be prohibitive. The cassette tapes, like reel to reels, may be erased and reused. Recording in itself erases former material; but, occasionally, bits and pieces of an old recording remain at the points where the recorder was being started and stopped, so it may be desirable to use a tape eraser or to run the whole tape with "record" depressed and the microphone detached. Tape copying machines are now available in most school systems. Both sides of a cassette can be reproduced at the same time in about sixty seconds.

The most efficient use of tape recorders is gained by programming reusable drill material such as vocabulary, number dictation, number facts, phonics, and spelling. Other appropriate uses include auditory training, following

directions, listening, oral comprehension, reading (following printed copy or recording oral reading), presentation of information, speech improvement, testing, music, and physical education accompaniments (Smith, 1966). Regular class teachers should be encouraged to tape objective tests for students who cannot read well enough to take them otherwise. Independent work is greatly facilitated by the tape recorder, freeing the teacher to work with another group or individual.

Headsets can provide the additional advantage of reducing distractions and focusing attention on the learning task. A jack box enables several students to use the recorder simultaneously. Jack boxes can also be used as extensions to other boxes if cords are not long enough to permit a desired seating arrangement. The size of the plugs on headsets and microphones varies from one model to another, as does impedance, so equipment should be checked for compatibility prior to purchase. Adaptors are available to handle some of the size problems. Sound quality or earphones being considered should also be checked. They can be used with most record players, radios, television sets, tape recorders, and many specialized teaching machines.

Sound quality may be affected by maintenance practices. Recording heads on tape recorders should be cleaned after every 8 to 10 hours of use and demagnetized according to the recommendations of the manufacturer.

Speed of recordings depends on the purpose and type of material. Music requires a faster setting than speech. The pace should be determined empirically by the teacher and rechecked occasionally by listening and watching the students at work. Beginners often record too fast and do not allow sufficient time between items.

There are at least two machines on the market which have a strip of tape along a flashcard, providing audio. In one model the card is stationary and the recording head moves; in the other, the card moves through the machine. Cards are not interchangeable between the two brands. Both have several programs available that are suitable for use with handicapped students. Blank cards may be purchased for teacher-made materials. The tapes have two channels, one for the instructor and one for the student, so the student can record his responses and compare it to the instructor's. The tape can be erased and reused, so more flexible use of the blank cards can be made by attaching the visual temporarily rather than writing or drawing directly on the card itself. An index card may be fastened to the blank card by a paper clip or staple. The visuals can be collected in this way without tying up so many cards. The recording would have to be repeated, so time required for doing so and frequency of use should be considered in deciding on the procedure.

Another interesting machine provides both the visual and auditory on a sheet of paper. The image on the paper may be typed, written, drawn, pasted, spirit duplicated, etc. A four-minute recording is made on the back. The machine can be stopped and started during the recording to give time to follow the directions. It utilizes a plastic, write-on cover sheet for responses. The special paper is relatively inexpensive, but the machine is not. It is designed for use by one student at a time, and it is somewhat complicated to operate. A cassette player and accompanying visual can achieve much the same effect. The major advantages observed by teachers have been novelty and ease of keeping the visual and auditory material together which stores easily in a file.

Other combinations are seen in an array of ingenious teaching machines. A desirable feature in some of them is immediate verification of correct response. Cost and the small number of appropriate programs have limited their usage with the handicapped. Scheduling which permits continual operation increases return on the investment since one child at a time ordinarily uses it. Two or three children might be able to share a machine, alternating responding. This could even increase interest, but reduces three of the major features—self-pacing, active involvement, and immediate feedback. Rental or loan of equipment is now possible for some of these systems with purchase of the programs.

## PRINT

This category includes media ranging from word cards and experience charts to textbooks. It is the most abstract and represents the highest proportion of materials used in special education programs. Considering the learning characteristics and motivational problems of handicapped students, it is hoped that this proportion is being reduced as more appropriate software becomes available for use with the hardware and as teacher training improves.

All printed material such as name tags, labels, charts, chalkboard, and seatwork should provide neat and consistent models. A standard handwriting system should be adopted and employed by teachers, aides, parents, and children. Sometimes the models over the chalkboard, in the spelling book, and in the writing workbook are from three different systems. An excellent correspondence course is offered by one of the publishers of handwriting at nominal cost. Free packets of practice material are also available for preservice or inservice training in handwriting.

Duplicating processes have altered remarkably over the past decade. Rapid reproduction of clear copies is possible in most schools. Individual worksheets are generally recommended over workbooks to avoid the lock-step

sequencing and pacing of assignments. If all students are assigned the same number of the same worksheets, the same disadvantages apply as to workbooks. The ease and variety of duplicated materials should be utilized to increase individualization of instruction. Worksheets and workbooks are evaluated in terms of prerequisite skills, instructional value, number of different instructions required per page, reading requirements, and interest level.

Spirit masters can be made directly from printed materials. They can also be made by typing, writing, or tracing on the master. Multicolored reproductions can be made by using different colored carbons. Color cues for starting and stopping can be added with these also. In the event the brown sheet is inadvertently left in during the writing step, the brown sheet will usually run just as well. Corrections are made by scraping the carbon off (a razor blade works well), putting a small piece of the carbon behind the error, and rewriting. When typing a spirit master, inserting it in the typewriter upside down makes it easier to correct errors without removing the master from the machine.

Interest in experience charts is enhanced by real involvement of the students rather than the teacher writing, students copying approach. Advance planning is needed on the part of the teacher to prepare "leading questions" to elicit the desired concepts and vocabulary. Colored marking pens add interest to the copying step. Another approach to increase creativity is placing key words on the board or chart during the discussion and allowing the students to each form their own stories from them. Use of the overhead for both composing and the final product is more palatable to older students than the chalkboard and chart. Dictating into a tape recorder may also elicit more response from some students than class participation.

Textbooks are highly prized by many of the students in special education, especially if they have hard backs and small print. Some of the texts designed for slow learners or disadvantaged students can be used effectively. A few series specifically for the retarded are available. Textbooks should be evaluated by appropriateness of content, reading level, rate of vocabulary development, sequence of skills taught, and interest level (topic, pictures, format, and type size).

## CONCLUSION

A plethora of media exists in education today. Major problems confront the special educator in selection and adaptation of material to be used with the handicapped. A network of national, regional, state, associate, and local instructional materials centers has been established to assist

in locating, organizing, and evaluating instructional media for use with the handicapped. Several information retrieval systems have been devised and are now in operation. It is the role of the teacher to employ these supportive services so as to develop a repertoire of resources from which to make a match for each child.

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# CLASSROOM FORUM

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## PROBLEM 30

*What suggestions can you offer concerning gaining parental support of occupational and vocational training for handicapped students?*

Gaining parental support lies strictly in a public relations area. A teacher-coordinator must have first-hand knowledge of all the various agencies involved in a work experience and study program. It is also essential that the same person have an adequate background in the vocational area and preferably hold a vocational credential.

The student who enters a vocational program has presumably spent nine or ten years in a basically academic setting. The parents as well as the student have been conditioned along these academic lines. When the student becomes enrolled in the work-study program, his world changes drastically. Academics are stressed only in conjunction with the work world, in a realistic and lifelike situation as it pertains to each student.

There are several resources available to the teacher-coordinator, ones that he may use as a quick and easy means to describe his program and gain parental support. A parent who is already knowledgeable or familiar with the program may be a valuable asset.

Another meaningful resource involves preparation of a slide presentation which includes slides of (1) students working at on-the-job training stations and (2) the various

agencies that are directly involved with the students. The teacher-coordinator should then arrange a meeting and invite all parents. Along with the presentation, employers of working students and personnel from the involved agencies should be present to explain their participation. If possible, invite two or three graduates from the program who are gainfully employed (and, preferably, living semi-independently or independently) to speak of their successes since graduation. A short statistical report comparing two or three vocational programs versus academically inclined programs could also be used to promote a positive attitude in parents' minds. All questions concerning individual students and the total program should be answered honestly and realistically.

It will be necessary to make home visits to those parents who do not attend the meeting to show the slide presentation, explain the program, and answer all questions. Many parents have skills to be utilized as part of the teaching-learning process. Try to get these parents involved.

We wish to thank Ken McDonald, Coordinator, Work Experience and Study Program, School District #6, for the above suggestions.

All readers are invited to submit questions to the *Classroom Forum* column. Send your questions to the Editorial Offices, *FOCUS ON EXCEPTIONAL CHILDREN*, 6635 East Villanova Place, Denver, Colorado 80222.

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