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Ingredients (Immediate Materials Selection).

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A prescriptive materials laboratory, called the Educational Modulation Center, (EMC) provides teachers and consultants with immediate access to materials for use in specific teaching situations. Materials included in the EMC files are carefully analyzed according to mental age level, material format, general and specific content, stated purpose, the amount of coverage devoted to various skills, organization, type of activity, print size, price, teaching aids, and source availability. All entries are numbered and indexed, using thesaurus index terms, and are stored using an optical matrix system. Potential users consult the thesaurus for terms covering the subject in which they are interested, scan the cards corresponding to the term, and select the materials which will fit their needs. (MD)

CEC

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INGREDIENTS (IMMEDIATE MATERIALS SELECTION)

Though there are many devices for evaluation and a large array of instructional materials at our disposal, as diagnosticians and remediation personnel, we always come back to the same question. What is the link between diagnosis and remediation of specific learning problems?.

At the Educational Modulation Center we feel part of the answer can be found through the development of a prescriptive materials laboratory. The prescriptive materials laboratory is based on the hypothesis that educational materials can be adequately broken down to be used effectively with specifically defined learning problems.

The prescriptive materials laboratory is much like a pharmacy. It is an attempt to provide immediate access to materials for teachers and consultants who need the vital ingredient to fill the educational prescription quickly.

In recent years, classroom teachers have become quite knowledgeable about methods and materials. But where can the teacher go to find materials? Unfortunately, most curriculum libraries are not as well stocked as the local pharmacy. But most important, the available materials are not analyzed as are the pharmacist's compounds. In order that materials be truly prescriptive, a careful analysis of specific components must be made.

Three primary requirements must be met for the prescriptive materials laboratory to be functional:

(a) A large collection of instructional materials

(b) A method to analyze this material

(c) A system for retrieval of information gathered in analysis

The first decision to be made is the kind of material to be included. Materials used in a prescriptive approach are similar to those used in any classroom. All types of materials in subject and skill areas and in a variety of formats such as tapes, filmstrips, transparencies, and more standard formats are found in the materials lab. However, the selection of material for a specific child is based on a thorough analysis of the content of the material which is studied in relationship to the strengths and weaknesses of the individual learner.

The primary emphasis as far as prescriptive instruction is concerned is on the materials which can be best used to remediate a specifically defined problem. Any material, if it contains the desired elements the remediation personnel is searching for, could be prescriptive. For example, if a child has a comprehension problem, the New Practice Readers or the McCall Crabb readers may be indicated as an appropriate choice. A science text with comprehension questions at the end of each chapter, may, however, serve the same purpose.

It is simply a matter of priority assignment. It is more profitable to first include those materials which by surface examination, appear to offer more possibilities for

remediation of specific difficulties.

A large collection of instructional materials provides the needed tools for diagnosis-remediation personnel. Such a collection, however, does not insure efficient and prescriptive use of the material. Prescriptive instruction is possible only when the materials for use have been thoroughly analyzed.

Analysis of instructional materials has been going on for some time. This has been, however, a very gross procedure. There has not been a specific analysis such as, "This workbook is divided into four units. Unit one deals with the initial consonants s, t, d, f, and b. Unit two and three presents initial bl, br and sl blends. Unit four provides work with medial short vowels, etc."

A quick examination of a table of contents or scope and sequence chart gives a general idea of what the material contains. Such an examination does not, however, indicate how much time is spent on the various skills included, how the material is presented or many other equally important aspects of the material.

Analysis can be accomplished only by careful examination of all components of the material. Such a process is comparable to the chemists analysis of a chemical compound. The materials analysis, like the chemist, is interested in exactly what ingredients are present within the material, the amount of the various ingredients and their interaction with one another. If, for example, it is a phonetic material,

just exactly what areas of phonics does it cover? How much coverage does it give it? How does the author present the material?

At the EMC an attempt has been made to provide a method whereby a teacher could come in and request information on a specific material. The tool designed to provide such information is the Descriptive Analysis Sheet.

The primary purpose of the Descriptive Analysis Sheet is to provide the user with narrative information which will aid him in deciding if he wishes to examine the original item. The Descriptive Analysis Sheet contains the major ideas of the material as presented by the author or publisher, distinguishing features and physical description of the material in a few carefully measured words. To obtain reliable results the materials analyst must follow well-defined procedures as the chemist in his laboratory. At the EMC, each analyst follows the EMC Guide for Analysis of Instructional materials.

In order for a materials laboratory to be prescriptive, each series of material and each item within the series must be analyzed in detail. For example, there would be an overview analysis written on the Phonics We Use Workbook Series. After completion of the overview card for the series, a separate single item analysis would be done on each book within the series.

The analysis process begins by a general perusal of the series. Several sources may be used to obtain a general

idea of the material. The teacher's manual, the preface, the forward, book jackets, brochures, catalogs, and page by page examination of the material gives the analyst a general view of the material.

The first part of the analysis process requires the analyst to record basic identifying information about the material on the analysis worksheet. The analyst then describes in coded terms, the mental age level, the major area assignments, and the format of the material.

At the EMC the mental ages of three through sixteen were arbitrarily selected as those to be used to describe the materials in the system. Mental age is used rather than chronological age for two reasons. Mental age is a more precise descriptive term and it is easier to handle the concept of mental age in research procedures.

Instructional materials are now available in almost limitless methods of presentation. This makes it desirable to provide a method for efficient selection of the format. This is accomplished by indicating on the worksheet all appropriate descriptors. For example, to describe the format of an SRA Kit, A29, the corresponding code number for the format descriptor of kit would be indicated on the worksheet. Some items would need more than one format descriptor to completely describe them.

For analysis-retrieval purposes it is necessary to categorize materials by major areas. It is probable and

desirable that many materials will be assigned to more than one major area. Cross references to more than one major area provides for greater efficiency in material retrieval. For example, the Peabody Language Development Kits are assigned to the major areas of Speech and Language Development, Reading Readiness, and Correlated Reading-Language Arts. The worksheet contains a list of all major area descriptors. The analyst indicates appropriate major area descriptors by circling corresponding code numbers on the analysis worksheet.

Requests for materials with certain characteristics resulted in a procedure whereby all materials with large print or those with other special characteristics such as a multi-ethnic presentation could be recalled. The particular selection procedure is especially valuable to those engaged in research.

The next step is specific content analysis of the single item. Specific content analysis is a short hand method of describing the material, through the use of descriptors. The Thesaurus, which provides the descriptors for use, enables the vocabulary used in various instructional materials to be matched to the vocabulary of the retrieval system.

Specific content analysis involves breaking down each piece of material into its component parts. This is accomplished by a combination of several procedures. The analyst may examine scope and sequence charts to obtain an idea of all skills presented and in what books or what order are they

presented. The table of contents and the index may also prove helpful. Most important of all, however, is page by page examination of the material.

Follett Publishing Company has published a readiness material titled, I Want To Learn. How does the analyst begin the specific content analysis for such an item? At this point the analyst has already examined the material to get enough general factual information to classify the material into major area. The assignment to major area provides a clue to the analyst to begin searching for possible descriptors in the Thesaurus under the major area headings already indicated.

Since one of the major area descriptors used to describe thi particular material is Perceptual-Motor Development the analyst begins a search under that area. At this time the analyst must match the information found in the material with the language of the Thesaurus. Many times it is possible to make a direct match from information of the material to the Thesaurus, since the terms were originally derived from examination of such materials. For example, Visual Motor as listed in the table of contents of the "I Want to Learn" material by Follett matches directly to a term in the Thesaurus. The code number for visual motor coordination is then recorded on the worksheet as one of the specific content descriptors of this material. Assignment of only one major area descriptor to a material in no

way limits the specific content descriptors that may be used. Any descriptor in the Thesaurus may be used to describe a material.

After completion of specific content analysis the analyst completes a narrative analysis. He completes a narrative analysis following the guidelines in the analysis guide.

The narrative analysis begins with a descriptive statement of what the author or publisher says the material is designed to do. Included is any statistical information which supports the authors contentions. No value judgments are made about the material.

The next guideline asks the analyst to include a statement concerning the amount of coverage devoted to the various skills presented in the material. This section calls for a highly specific statement about the various skills and concepts presented and the amount of space and time devoted to each. Materials such as math books present many specific skills making it impossible to handle each skill separately. However, the analyst should ask himself such questions as, "Does the material only introduce the various skills and concepts? Does it offer only a few or several pages suitable for expanding an already existing developmental or remedial program, or does the material provide a developmental approach which develops the skill to a high degree?" Whenever reasonably possible the analyst

includes number of pages devoted to a specific skill or group of skills. At this point included is such information as word count, vocabulary load, sight vocabulary and the rate at which new words are introduced. If the material is high-interest low-vocabulary or other reading material a brief synopsis of the story is included at this time.

Other information informs the reader as to the organization of the material. Is it by chapter or unit? Are there activities or exercises at the end of the chapter or unit or at the back of the book? Notation is made at this time if the author uses special techniques such as color cueing. Also included is information as to if the material is presented in all paper-pencil approach, or audio-visual aids or physical activity included as a part of the lessons.

An important factor in the selection of any material to use specifically with one child in the regular classroom setting is the amount of teacher time required to make effective use of the material. Included in the guide are four statements from which one may be selected or two combined to form the basis for describing the aspect of teacher involvement. The statements made by the analyst must be supported by fact based on information taken from the material. The description can be made only by the analyst carefully reading the manual to determine how the author expects his material to be used. Making a statement regarding teacher time, without presenting support is unacceptable.

No evaluation is made concerning appropriateness of illustrations included in the material but the guidelines request the analyst to relate the types of illustrations found in the material. Also included is information about content of the illustrations, the number, the placement of the page and the size.

The size of the print is described by referring to a point type guide. The analyst also notes the arrangement of the print on the page. Does the print flow smoothly from left to right, or is it broken by illustrations? Recording information of this type indicates materials that may be suitable for sight saving material.

Also included is information about physical aspects, the teacher's manual, the price and the source where material can be obtained. There is also an opportunity for the analyst to provide ideas for modification of the material, under the heading of "suggestions."

An accumulation of analysis sheets presents another problem. The wealth of material that may be gathered through analysis of instructional material is of little use without an efficient method of retrieval. Searching stored documents to recall information is a tedious and time consuming operation. Perhaps most regrettable is the duplication of effort that occurs when information is not stored in such a manner that it may be quickly recalled by an individual.

Experience has proved that previous methods of retrieval have been inadequate. The answer obviously does not lie in card catalogs, or in the traditiona' approach to indexing and abstracting. The type of retrieval system needed by the prescriptive materials laboratory must be much more precise than that of the traditional library.

It was determined that an optical matrix system could best fill the needs of the EMC. In this type of system the coding area of a single card represents one term in the indexing vocabulary. If there are 300 descriptors in the Thesaurus, then there are 300 cards in the descriptor file.

Each material to be analyzed is assigned a document number. All code numbers describing a material are taken from the worksheet and corresponding descriptor cards pulled from the file. It may take as many as twenty or thirty cards to describe one material for major area, mental ages, format, and specific content contained.

Assume for exampl'e, that document number 158 has been assigned to the "I Want to Learn" material. All the descriptors cards that describe this material would be placed on the encoder and by manual operation a hole would be punched through 158 on all appropriate cards.

This type of system is searched by superimposing appropriate cards over one another on a light box. Each place a pin-hole of light shows through indicated a number on the grid. The numbers on the grid refer to a file containing Descriptive Analysis Sheets in a numerical sequence.

If the teacher upon arrival at the EMC has a particular material in mind, the title card file serves as the retrieval instrument. A user wishing to know if we had the Phonics We Use Learning Game Kit would go to the title card file. From this file the user may obtain the number of the Descriptive Analysis Sheet which gives narrative information about the material. The title card also provides the shelf number of the material.

What questions will users of a prescriptive materials laboratory ask? It seems reasonable to assume that a kindergarten teacher may want to retrieve all reading readiness materials, that an English teacher may wish to preview all available information on vocabulary development, or that a reading teacher may wish to examine all phonetic materials.

To retrieve the analysis sheets for all phonetic materials, the user goes to the Thesaurus and looks under major area descriptors for phonics. The code number tells the user the location of the descriptor card in the file.

The descriptor card for phonics is then placed on the viewer. Each pin-hole of light indicates a number on the grid. The numbers in turn refer to Descriptive Analysis sheets on phonetic materials. Though this type of retrieval is valuable, much more is needed for purposes of prescriptive instruction.

The classroom teacher or remediation specialist must be able to select material to teach very specific skills and

concepts. A user of the prescriptive materials lab may, for example, wish to retrieve materials to teach final consonants.

By using the alphabetical section of the Thesaurus, the code number for final consonants is located and the descriptor card for final consonants is pulled and placed on the viewer.

Each pin-hole of light refers to a material that contains final consonant work. Since several possibilities will exist, the user may wish to narrow the search by placing a further requirement on the material selection.

Mental age of the student is sometimes an important factor in material selection. The user may select material for any mental ages three through sixteen by superimposing the desired mental age descriptor card over the final consonant descriptor card. For this example, presume selection of the descriptor card for mental age of seven.

The user also has an opportunity to specify format. If he wishes the material to be in game form, the descriptor card for games is superimposed over final consonants and mental age seven. All pin-holes of light that show through indicate a material that contains final consonant work in game form, suitable for a child with a mental age of seven.

If one of the numbers on the grid is 1302, the user would then pull that folder from the file. The Descriptive Analysis Sheet will inform the user of the shelf location

and number of the item. The letters PH, for example, indicate the material is housed in the phonics section.

The number that follows indicates numerical order on the phonics shelf. Since the materials are shelved in groups, such as phonics, linguistics, programmed math, materials are easy to locate.

As with most systems that work on a machine principle, the functioning of the analysis-retrieval system is only as good as the management of the system and the material fed into it. In other words, the analysis-retrieval system has to rely on the diagnostician to ask for the correct information.

Now the question is what can material analysis do to aid in the remediation of specific disabilities? Perhaps the biggest thing it can do will be to supply diagnosis-remediation personnel with fingertip information that previously has had to be ferreted out by the time consuming process of going through volumes of material until the right thing was found. And it had to be done by each person each time there was a need. Through the analysis-retrieval system, specific information is coded into cards which will be automatically selected when proper questions are asked of the retrieval system.

Previously, the emphasis has been on evaluation of material, not analysis. For the most part this evaluation has involved teacher reaction to a material, not a study of student performance. Oftentimes, the teacher may not have

even tried the material with students. Though a large collection of opinion evaluations may be a useful technique, such a procedure lacks validity. Material can only be evaluated by its effect on children's academic behavior. This type of evaluation must necessarily take place over a prolonged period of time.

Analysis and evaluation, two separate processes, compliment each other. Before a measurement of a material's effectiveness can be made, it is necessary to first analyze the material to determine its goals. On the other hand, evaluations of material may be recorded and used to verify or repudiate the goals as recorded in the analysis process.

The demands of time placed on the classroom teacher, and other professionals makes a thorough analysis of all instructional materials by each individual an impossible task. It is, however, such an analysis that is prerequisite to effective prescriptive instruction.