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ABSTRACT

Competent middle school teachers must both extend students' abilities in the decoding and comprehending skills and stimulate their applications of these reading skills in content area texts. In considering this differentiation of instruction, teachers should be aware of an aptitude by treatment interaction (ATI)--no one technique will produce the same result for all students. Since in a typical middle school, student reading ability may span eight grade levels, with four possible variations of problems--organizational, decoding/vocabulary, interest/purpose, and experience background--differentiation of instruction must be process oriented. For each of these problem areas, various teaching techniques are practicable and effective. Throughout instruction, middle school teachers should remain cognizant of their roles in preparing independent learners for the content orientation of the secondary school. (A bibliography is included.) (JM)

# Differentiating Instruction to Improve Comprehension in Middle School Content Areas

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# Differentiating Instruction to Improve Comprehension in Middle School Content Areas

A primary task facing the middle school teacher is aiding student transition from the skills oriented primary curriculum to the content oriented secondary curriculum. Thus, the role of the middle school teacher fits a diagnostic-prescriptive model. It entails identifying student's needs and abilities and offering an appropriate instructional sequence that alleviates the needs while developing and extending ability. Instruction, then, is differentiated on two levels: ability and needs.

To be an effective teacher, instruction must be differentiated for all learners. The middle school teacher's task varies somewhat from that of the primary or secondary teacher's: In the primary grades teachers often differentiate instruction on the basis of decoding ability. Primary instruction focuses on teaching children how to read. The secondary teacher generally has little training in the process of reading. Thus, we see instruction differentiated on the basis of reading ability infrequently. The traditional role of the secondary teacher has been that of a content area specialist. In this model the teacher's task is primarily concerned with imparting knowledge from his content specialty. The middle school teacher, as a recently recognized entity, has lacked a clear task definition. It would seem, however, that the middle school teacher must combine and extend the roles of his primary and secondary school colleagues. The middle school teacher must extend student abilities with decoding and comprehending skills. Beyond this, students must be taught to effectively apply the reading skills in content area texts. Thus,

the task of the middle school teacher is supportive of model of teaching which emphasizes fostering development of reading skills rather than mastery of content (Smith and Barrett, 1974).

Effective differentiation of instruction must consider the possibility of an aptitude by treatment interaction (ATI). An ATI simply proposes that any single treatment, or method of instructional differentiation, may have dissimilar effects on various student populations. That is, no one technique will necessarily have the same facilitative effect for all students. It is surprising that the possibility of an ATI should so often be overlooked by authors and teachers. Much like an athletic coach who does not expect one training technique to suffice for all athletes participating in all sports, the middle school content teacher needs to assess each instructional technique as to its appropriateness for various students.

Considering the textbook orientation of most content area curricula, probably no other factor presents more problems than the mismatch of textual difficulty and student reading ability. Content area teachers have long been admonished to calculate the readability level of assigned materials and determine appropriateness of the texts for their student population. However, this has often led to a single able/unable to read dichotomization. Recent research has demonstrated that students' needs can be classified more accurately. Further, it has decidedly pointed to the possibility of an ATI for many of the most commonly offered techniques for differentiating instruction.

Cromer (1968) identified two distinct subgroups within the larger classification of poor reader. One group, the <u>difference</u> poor readers, had average or above average decoding/vocabulary skills, but generally performed poorly on comprehension tasks. That is, the difference

between these students and good readers, "is attributable to the way in which they relatively input what they read." (Levin, 1972) These students seem to have few traits commonly associated with poor readers, and yet, they are both inefficient and ineffective information processors. A second group, the deficit poor readers, lack the necessary decoding/vocabulary skills. Thus, processing of assigned textual material is impossible since these students simply lack the requisite word identification and meaning abilities.

The available research indicates an ATI for instructional techniques applied to these subgroups. The difference readers seem to profit from instruction that provides organizational assistance (Cromer, 1970), while simply providing lower readability level material may not prove facilitative for this group. Likewise, the deficit readers profited little from organizational assistance but would seem to profit from textual material more closely approximating their word identification level. Of further note are the results of later research which indicate that while poor readers comprehended more when they listened to stories than when they read them, for good readers the situation was reversed (Oakan, Weiner and Cromer; 1971). These results would seem to indicate that when considering an instructional treatment one must be cognizant of the possibility of an ATI. However tenuous the research may be, the theoretical model from which the concept of the difference and deficit readers flow presents many pedagogical implications for the middle school teacher.

## Differentiating and Instruction

As mentioned earlier, the middle school teacher has a dual role in instructional differentiation. Instruction must be geared not only to match the achievement level of the student but geared also

to develop and extend student abilities.

Differentiation must begin by providing the student with a manageable task. Manageable in terms of the students' prerequisite abilities. This seems to be the most common interpretation of the differentiated instruction. However, at all levels, but especially in the middle school, matching students and tasks is not enough. Instruction that develops, extends, or refines student achievement must be coupled with the initial differentiation. While providing the secondary student with a text suited to his achievement level may satisfy the content area teacher's concern for imparting knowledge, it does not ensure a development of abilities beyond those initially brought to the task. The middle school teacher must emphasize continued skill development rather than mastery of content. This task requires developing student skills and abilities as well as providing instruction which emphasizes employing these skills.

The range of student reading ability in a typical middle school can easily span eight grade levels. This range, coupled with the diversity of skills needs, poses the challenge for the middle school teacher. The task, as set forth earlier, is not only to provide appropriate level materials but to develop and extend the application of reading skills into the content areas. Within the difference/deficit model two types of instructional variables were identified: organizational and decoding/vocabulary. To these add two further variables which influence comprehension: interest/purpose and experience background. These four variables need to be considered when differentiating instruction to improve comprehension in middle school content areas.

The decoding/vocabulary variable

Identifying students who have inadequate decoding skills can be accomplished by a number of techniques. The most hazardous would seem to be to compare student reading ability, as measured on a standardized test, with the calculated readability level of the assigned textual material. This technique would provide general information, but due to errors of measurement inherent in both group tests and readability formula, the result are often misleading (Sipay, 1964; Brigham, 1970).

A second technique for identifying students with decoding problems is the use of the cloze procedure (Bormuth, 1968). This technique requires students to fill in every fifth word which has been deleted from samples drawn from the assigned textual material. However, while the minimum percentage of words needed to be filled in correctly has been fairly well established (44%), there has been no evidence offered that all students falling below the cut off may be deficit readers having inadequate word identification/vocabulary. However, it has been established that, for whatever the reason, students falling below the criteria lack ability to independently process the material.

A final technique, the open book reading assessment is probably most accurate, but unfortunately, time consuming. As described by various authors (Bader, 1972; Viox, 1968; Shepherd, 1973) this technique is similar to the informal reading inventory used by many primary teachers. Again the student skills are measured in the text-book to be used in the content area class. Students begin by silently reading passages and completing comprehension tasks. Students having difficulty with these tasks might then be further screened by the teacher through the use of oral reading. Following this assessment

the teacher may evaluate the decoding skills of certain students.

Each identification procedure has its merits. Standardized tests and readability levels are efficient. The cloze procedure is also efficient, with the added strength of testing the student in the assigned text. The open book reading assessment provides the most accurate measure with maximum information on each student's ability to master the assigned text. However one decides to proceed, an initial check for the mismatch between textual difficulty and student reading ability is necessary.

Once identified, students with decoding problems need differentiated instruction. A first step might then be placing the child in a text of appropriate readability. Little will be gained from forcing the student to struggle in a text that he cannot manage. Even less is accomplished by ignoring the problem. In some cases it might be impossible to identify a text matched with student ability level. Recording the lessons on tape, or having someone read the material to the student, are techniques for imparting basic content area information. However, the use of these techniques offers the student nothing as treatment of the problem. While the student may retain information, he has become a dependent learner. If the student has deficient decoding skills, instruction must focus on correcting that situation rather than circumventing the cause.

If placement in suitable material is impossible, instruction must then be provided to develop the needed skills. The middle school teachers cannot, like his secondary colleagues, plead ignorance of how to proceed. Instruction cannot be assigned to the reading teacher. Each middle school teacher has the responsibility to teach the reading skills necessary to become an efficient and effective reader. Fusing

reading instruction with the content area subject matter must become routine in the middle school.

Identifying students with vocabulary or word meaning difficulties is not accomplished easily. Knowledge of key content area words as delta, photosynthesis, meter, etc. can be readily assessed. However, for many students the vocabulary difficulties entail general words. Whether these are content or function words matters little. The fact remains that many middle school students have inadequate meaning vocabularies. These students will have trouble outside content area texts and the problem is compounded by the technical vocabulary load of a subject.

If decoding skills are adequate many standardized vocabulary tests are available. Low scoring students need instruction differentiated to include vocabulary development. To identify those lacking the technical vocabulary of any given content area, the teacher would be well advised to personally construct a test to assess student understanding of technical vocabulary, again providing instruction as indicated by test results.

There are then, a number of methods for identifying students with inadequate decoding/vocabulary skills. Treatment follows in two steps: 1) placing the student in appropriate material; and 2) instruction to develop the necessary reading skills. Identifying vocabulary deficiencies requires two strategies. One for deficiencies in technical language specific to each content area and a separate strategy for general vocabulary deficiency. Instruction appropriate to each student's needed vocabulary development then follows.

Providing an Organizational Framework

Probably the greatest impact of the difference/deficit research should be to convince teachers that adequate word identification/vocabulary prerequisties are not sufficient to ensure student understanding of textual material. While a mismatch between student reading and vocabulary abilities cannot be overlooked, likewise, it should not be considered the solitary determinant of comprehension.

The work of Cromer (1968, 1970) and Levin (1972a, 1972b) seems to demonstrate conclusively that some students with adequate word identification/vocabulary abilities cannot effectively process and retain information from textual material. Further, their research demonstrates that providing organizational assistance facilitates comprehension for these difference readers. Other researchers, while not employing the difference/deficit model have also demonstrated the facilitory effect of various modes of organizational structure. Andrews (1972) found a facilitative effect for directed reading questions and cognitive organizers. Directed reading questions are provided by the instructor and generally focus student attention on specific information in the assigned selection. Cognitive organizers also attempt to focus attention by providing a brief overview of the setting and sequence of events. These techniques proved useful for inducing comprehension in this study and the data support the work of others using cognitive organizers.

Many other organizational strategies would seem to benefit the difference reader. Probably SQ3R is the most widely advocated technique for improving comprehension. This five step approach requires the student to survey or skim a text selection and develop a series question prior to silent reading. Review after silent

reading is encouraged prior to evaluation or recitation. This technique may provide some of the structure necessary to more effectively process information. However, without a firm understanding of effective use of this technique, students may still employ previously acquired ineffective strategies within the SQ3R model.

A further technique, the directed reading activity (DRA) has been offered as a strategy for improving comprehension. The DRA, as defined by Herber (1970) consists of three basic steps; 1) developing background and purpose; 2) silent reading and study, and; 3) follow-up questions, discussion, and assessment. While the DRA is infinitely better than simply assigning pages with no stated purpose nor introduction, it holds little promise as a technique for improving the lot of either difference or deficit readers. It provides little organizational assistance for the difference reader and while the background and purpose setting should foster greater motivation, these students may still read with little organization or retention. The DRA offers the Deficit reader no relief from textual material beyond his word identification/vocabulary level.

Study guides as described by Herber (1970) provide a structure to guide the student through a content area lesson. Herber states that its purpose, "is to make certain that students develop a feeling for the process so that ultimately they will be able to use the pattern independently." However, while study guides may assist the student in identifying the 'right' answer, unless one assumes a transfer effect study guides do not necessarily teach the processes of comprehension. In either event, this treatment would seem to provide a facilitative assist for students in need of an organizational framework. The well constructed study guide (as described by Herber)

provides the reader with an organizational framework. If the premise underlying the difference model is correct, this framework would provide these readers with organizational strategies that they seemingly lack. Again, however, this treatment is predicated on the promise of a capable word identifier. Thus, students lacking word identification skills will find little assistance in the study guide developed for a text he cannot read.

Several techniques for providing organizational assistance have been offered. Again, each has its merits. Each also suffer from a common deficiency; transfer cannot be guaranteed. Students in need of an organizational framework must be presented with instructional strategies that are process oriented. When providing any of the suggested techniques to students it is important that the teacher demonstrate the processes involved. These students need to be weaned from teacher provided crutches and led to develop their own strategies and processes for organizing textual material. Thus instruction needs to go beyond identifying the correct answer and into the processes involved in organization and retention.

Creation of Interest/Purpose

A primary task of any teacher is to entice students to learn. Unfortunately, a majority of students either have no innate interest or purpose for school. The system provides a mechanism that instills interest and purpose in some students; this mechanism is called the grading policy. However, grades offer no incentive for many pupils. Beyond these students the teacher still has the responsibility of creating a motivating environment for all students.

Many of the techniques offered earlier can be analyzed in terms of the interest/purpose variable. However, the majority of those techniques provide extrinsic purposes. That is, the teacher decides what student purposes for reading shall be. While these techniques are successful, they can produce dependent learners. The techniques offered below are attempts to develop intrinsic purposes for students and thereby foster interest.

Student involvement in setting purposes can be guided by the teacher. One technique, described by Duffy and Sherman (1973), requires only that the teacher select a set of key words from the material to be assigned. The selected words are presented to the students on the chalkboard. For instance, for a unit on Egypt one might select words such as pyramid, pharoah, mummy. The teacher begins by asking students if they are familiar with any of the words. Following response by students, the teacher then asks if students have any questions about those words. As children respond (with a leader question from teacher if necessary) the teacher writes each question on the board. Vocabulary in certain questions may lead to further queries. This procedure continues until no further questions are posed. The teacher then directs the students to read the passage and find as many answers as possible. Thus, with a vested interest in the purpose for reading, students silently read the selection. Many questions posed will remain unanswered following the reading and this provides an excellent opportunity for the teacher to suggest supplementary sources. The emphasis is on locating relevant information, relevant in terms of student interest.

Adaptations to the technique include 1) supplying a teaser sentence from which questions can be elicited; and 2) having the student skim unit looking at pictures and italicized words to develop questions. While research has indicated that pre-questions may not be as valuable as previously thought (Rothkopf, 1966; Frase, 1967), other researchers report results that indicate different types of questions have differential effects (Estes, Mills and Barron, 1969; Bull and Dizney, 1973). However, none of the research cited included student generated questions.

Generating student interest and assisting in the establishment of purposes should be of prime concern for the middle school content area teacher. Student input in developing purposes fosters interest and assists the student's development as an independent learner, Again the teacher needs to be process oriented selectively providing feedback to student response. The ultimate goal for the middle school teacher is students who can set purposes and study independently.

Developing Experience Background

A lack of an adequate experience background can underlie many of the difficulties previously discussed; i.e. vocabulary deficit, interest, purpose. An adequate experience background is requisite to comprehension. Is it any wonder many students fail to comprehend abstract concepts and historical developments? Students who have never been outside their neighborhood, much less their start or country, will not always grasp understanding from texts alone. Can the child from the midwest farm understand the concepts of bias, urban decay, inflation, rapid transit, air pollution, etc.? Or the eastern urban child understand the concepts underlying terms such as;

prairie, tractor, heifer, silo, truck farm, milking machines or feeder cow? Experience allows us to organize and compare ideas, objects and concepts. Teachers can develop experience backgrounds without resorting to field trips. Experience can be provided at a number of levels (Gagne and Briggs, 1973). The field trip provides the entry level; direct experience. While direct experience is sometimes ideal it is also often impossible. Experience background can be build along a spectrum ranging from direct to vicarious to abstract experiences. Any level experience provided for students deficient in background are valuable. Experience aids in understanding, develops concepts and vocabulary and creates interest.

Many direct experiences are provided in certain classes. Imagine, for a moment, an industrial arts, driver education, or volleyball class without direct experience. Suddenly many of these areas would become as lifeless as many social studies classes. Direct experiences are often the key to understanding and should be provided whenever possible.

Vicarious experiences range from films and records, to role playing and still pictures. Films effectively portraying a historical era or scene can add depth to student understanding of social studies texts. Role playing, as vivid as the much reported experience with the abstract terms bias and prejudice in which students were identified as inferior or superior based on eye-color, forcefully develops understanding of concepts.

At the abstract level a simple comparison of the unknown with a familiar object or concept can facilitate understanding. In the manner by which one can compare a barren lot in a city or a barren beach on the ocean iwth a desert, teachers can facilitate understandin[illegible] the unknown by using what the student brings with him.

Many teachers do not take advantage of the possibilities available for developing experience backgrounds. Classroom projects, such as class newspapers, hobby clubs, aquariums, terrariums, candy sales, ecology surveys, weather stations, etc. all offer opportunities to develop and expand backgrounds, vocabulary, and understanding of abstract concepts. Experience is a necessary component in the development of comprehension skills and must be considered when instructional differentiation is planned. Experience is not enough, but coupled with differentiation on other levels, it provides assistance that can improve student comprehension.

Summary

The middle school teacher must be concerned with improving comprehension in the content areas. This improvement occurs when appropriate instruction is provided. This paper has attempted to outline an effective strategy that can be employed by the middle school teacher to achieve this goal. This short summary is provided in the hopes that if nothing else is reattained from this effort these five basic comments will remain indelibly in your minds.

1) differentiation of instruction is a two step process; a) matching student attributes to material, and b) providing instruction to develop and extend student abilities.
2) whenever one considers differentiating instruction be aware of the possibility of an aptitude by treatment interaction.
3) all instruction, but especially middle school content area instruction, needs to be process oriented. Effective reading is a complex process, much more than locating products or identifying correct answers.

4) do not expect students to figure out how to use textbooks. Textbook reading requires a variety of skills and students require instruction to develop these skills.

5) finally, the role of the middle school teacher is unique. That role is to develop, extend, and refine the basic skills previously learned so that independent learners are prepared for the content orientation of the secondary school.

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