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ABSTRACT

It is generally assumed that students possess the ability to apply abstract reasoning to content material in a variety of disciplines when they enter college. Yet many college students have not reached the level of formal operations defined by Jean Piaget; thus they experience difficulty in coping with their work. A solution to this dilemma can be found in the provision of content-reading activities based upon the principles found in Piagetian theory. Suggestions are made for practical applications of aspects of this theory to college reading instruction. (Author/AA)

Practical Applications of Piagetian Theory to College Reading Instruction

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Abstract

Reading proficiency is fundamental to the acquisition of knowledge at the college level. It is generally assumed that students possess the ability to apply abstract reasoning to content material in a variety of disciplines when they enter an institution of higher learning. Yet, many students enrolled in college have not reached the level of formal operations as characterized by Jean Piaget, and thus, experience severe disadvantages in coping with their academic pursuits. A solution to this dilemma can be found in the provision of creative learning experiences in reading content material based upon the sound theoretical principles found in Piagetian theory.

Practical Applications of Piagetian Theory to College Reading Instruction

Mature reading is a cognitive process involving the ability to solve verbal problems ranging from simple associations to complex abstractions. As one reads, he is engaging in conversation with a writer who is temporally and spatially removed from the situation. Thus, the reader is left with his own devices of interpretation in comprehending the message. The efficiency with which he uses the devices will determine the quality of his comprehension, for comprehension is affected either positively or negatively by the versatility of the reader. Comprehension is further affected by the general level of intellectual development the reader has attained at the time of the reading. Therefore, the development of instructional techniques for improving comprehension should be closely allied with a theory of cognitive growth.

Jean Piaget has devoted a major portion of his life to an investigation into the ontological development of perceptual and logical operations in children and adolescents. This theory, however, is descriptive of the acquisition of knowledge in human beings of all ages and can lead to an increased understanding of the processes of thought as they unfold in the continuum of development. The fundamental concepts in this theory are particularly applicable to college reading, for college students are mature individuals and are expected to apply the highest level of thought to content material in a variety of disciplines even though the actual cognitive levels of the students may be far below expectations. This creates a dichotomy which often results in a dilemma for students and instructors. For while the reading demands of higher education are clearly established, the abilities of the students are often inconsistent with these demands. Thus, students are constantly called upon to perform tasks which, for many, are impossible. They respond to this dilemma in three important ways: (1) accumulate information, store it and retrieve it at the appropriate time, (a reliance on

the memory and recall mechanism); (2) apply association techniques comparable to low levels of thought; (3) succumb to the pressures and admit failure. Several studies have been conducted which verify these observations. (Schwebel, 1972; Griffiths, 1973; Keasey, 1972; Perry, 1968) In discovering the limitations of students, these investigations have revealed a problem which requires considerable attention, for it pricks at the heart of higher education - the acquisition and proliferation of knowledge.

There have been some attempts to alleviate the problem. Too many of these efforts, however, have been aimed at only the "high risk" student whose deficiencies can be easily identified. Not enough energies have been expended in the direction of the average student who has learned to amass enough information to successfully compete on examinations, but whose thought processes are not fully developed. It is toward all students collectively that attention needs to be directed, and reading instruction, more than any other single factor, can provide the answer to the dilemma which has been described.

Piaget describes mental development in a series of stages which begin in infancy and culminate in adolescence. He identifies four levels of cognitive development - (1) the sensori-motor period, (2) pre-operational thought, (3) concrete operations, and (4) formal operations. Underlying all of Piaget's work are three principles which are characteristic of all stages. He believes that cognitively one adapts to the physical environment through the use of schemata (structures of organization); one assimilates new perceptual matter or events into existing schemata or patterns of behavior; or an accommodation is made in which new schemata is created or old schemata is modified. According to Piaget, all human beings seek an equilibrium of cognitive processes and when disequilibrium occurs, we begin to assimilate and accommodate the experiences until equilibrium is restored.

This process can be specifically applied to reading, for a reader must first attempt to assimilate his inner thoughts or past experiences with those of the writer as they are recorded on the printed page. Second, he must identify points of conflict or dissonance in his theory or that of the writer, and finally must adapt his own thoughts as he reviews his attitudes in an effort to adjust to the points of conflict and comprehend them.[1]

Since all college students are involved in reading and studying material from the academic disciplines, it is expedient to use the content of these disciplines as the subject matter for the development of reading skills. This practice eliminates the transfer of skills from commercial materials to what the student must read to survive. It is feasible because the reading process applies equally to all subject matter though flexibility is required as adjustments are made according to the nature of the material. The reading instructor must be an expert in facilitating the development of this kind of flexibility. He, or she, must understand that while initial students may be unfamiliar with the vocabulary of a discipline, the subject matter can be made relevant to their life experiences. Regardless of the socio-economic or cultural background of a student, his life has been affected by that knowledge which has been accumulated in the social sciences, natural sciences, mathematics, history and economics. He has developed an appreciation for some kind of art form though it may differ from that of the instructor or the college community. It is necessary, then, to assist students in realizing that the knowledge they already possess, informal though it may be, is pertinent to the academic disciplines. This can be accomplished by an orientation to a discipline apart from the assigned text or supplementary readings through discussions or tasks which force attention on the subject matter without the accompanying "jargon." Once students are confortable with the subject,

they can attack the vocabulary and begin to read the content. The initial reading becomes no more complex than a conversation with a stranger who uses different words to express himself - but words never-the-less that can be understood. This, however, is only part of the process.

The reader must be aware of problems he encounters as he reads. There are sure to be some points which are not clear and from which no conclusions can be drawn. If a student is unable to restate the author's ideas and use them to relate to his own ideas or formulate a new one, he has not "adapted" to the content. There is a "dissonance" which must be resolved. An effort must be made to solve the problem, but this is not always done instanteously. Gruber says:

> When the thinking person nears the forntiers of his knowledge, he necessarily touches on a number of primitive, unexplained ideas, some of which he must actually utilize in their unexplained form as premises in his system.[2]

Premises, however, seek verification. So the student must be led to a position of discipline for himself where he recognizes the difference between a premise in need of verification and a basic inability to comprehend the message. To inacurately identify confusion of the message as a premise of thought is to assimilate continually without accommodating. This should be avoided.

When a student has difficulty in this way with a concept he encounters in his reading, there are several alternatives he can choose. Another author may state the point more clearly, so he should try another source; the instructor may be able to clarify it by restatement; or he may discuss it with his peers informally or formally. It is the responsibility of the reading instructor to point out these alternatives and facilitate students' use of them. Once an acceptable alternative has been found, the student should return to the source of the problem to gain a new perspective

for continuing the reading. In the process of solving the problem, the student has adjusted his own thought to accommodate a new idea. He has reached a state of equilibrium and is free to pursue other tasks. The student who reads with this kind of involvement becomes independent and creative, freed of the anxiety which accompanies the student who must protect "stored" unrelated facts.

Action Centered Learning

Piaget declares that knowledge is acquired not through the senses from outside sources, but through action upon the environment and interactions with the environment. Knowledge cannot be imparted to a student through a lecture or a textbook without some internal intellectual activity. Knowledge, according to Piaget, is constructed in the course of a person's adaptive activity. Therefore, opportunities must be provided for students to interact with stimuli in the environment. The essential substances of any encounter are the concepts which it contains though it must be conceived in its totality and placed in a referential context. The following experiences are examples of the kind of activities which can be used in reading instruction to actively involve the student in his learning process:

--Have students read a controversial book (for example, Christopher Jencks' Inequality) and relate the author's concepts to current newspaper and magazine articles.

--Have students volunteer to write a "laymen's lecture" on a chapter taken from an academic textbook. A "laymen's lecture" is one which contains all of the concepts of an academic lecture without the technicality of terms.

--Use case studies for an introduction to selections in Psychology. The "jargon" is more comprehensible, if it is focused on a live subject to whom students can relate. (for example, anxiety neurosis)

--Have students write mock examinations one week before they are scheduled to take an actual one in an academic course. In the reading class, they can compare the mock exam with the actual one and discuss whether and how the predictions went awry. If this is done consistently, students find

that they become progressively more efficient as the year progresses.

--Most college campuses are rich with scholars who have made significant contributions to their fields of interest. Students should have the experience of reading what these investigators have written and then of interviewing them for immediate responses to questions formulated during the reading. Persons with less scholarly backgrounds, but with comparable contributions such as educators in the community, politicians or social workers are also easily accessible for interviews.

Active involvement also leads to an integration of knowledge across discipline lines if the student is able to make connections in his thought. Attempts have been made in some institutions to incorporate several academic disciplines in an effort to eliminate the artificial separation of knowledge that has characterized higher education. Since this is usually an administrative decision, students often continue to identify disciplines as separate entities. Eleanor Duckworth has stated:

> Thoughts are our way of connecting things up for ourselves. If somebody else tells us about the connections he has made, we can only understand him to the extent that we do the work of making these connections ourselves.[3]

In a reading course consisting of selections from all disciplines, subject matter can be integrated and this experience can form a foundation for further integration by the student.

The concept of qualitative identity from Piagetian theory underlies the integration of content material. According to Piaget, qualitative identity allows several actions to be performed on the same object without changing its identity. Thus, a chapter read in a history book can be applied to learning acquired in Psychology, Sociology, Literature or any other discipline. The task of collecting data for research papers becomes considerably less a chore when students realize that the same content can be viewed from different vantage points and thus used for more than one class. It is also interesting to have students select a topic and explore it from three or more vantage points; for example: "Democracy" as explained by a political scientist,

sociologist and a psychologist. Or, have students select texts or articles in perdiocals to defend or deny a particular position on a broad topic; for example: "liberation" as it affects women, Blacks or homosexuals.

Social Interaction

Social interaction is an important part of cognitive development at all levels. The infant responds to individuals and objects with his own reflex actions. Later, he is able to imitate the actions of others. The young child communicates verbally. Conceptual growth is dependent on this kind of interaction.

Reading is also a form of social interaction, for the ideas of the writer are transmitted to the reader through the written symbols. However, the successful reception of the message depends on the skill of the writer in the manipulation of symbolic language and the interpretive skills and experiences of the reader. When all of these factors are operant to a superior degree, they tend to reinforce each other and communication is possible. On the other hand, if one or the other is insufficeintly developed, the chain of communication may be broken and the interpretation may be incomplete. If the deficiency rests with the reader, opportunities for verbal exchanges should be provided in an effort to further develop interpretive or logical thought processes. Group projects involving research activity in which each group member focuses on a different aspect of a subject and then incorporates his findings with those of others and culminating in debates, panel discussions or mock courtroom scenes are excellent experiences. These experiences, when based on subject matter of interest to the students, can lead to improved comprehension.

A carefully planned reading program includes many opportunities for social interaction so that students can develop and test their own interpretations and conclusions with those of other students. The natural need of this verification

of ideas leads to more logical thought.

The egocentricity which is characteristic of early childhood and adolescence in Piagetian theory is recognizable to a degree among college students as well. Too many college students are unable to "decenter." They continue to occupy the center of their world with little concern for expansion. Reading instruction can widen horizons for students so that they will be able to explore areas of life far removed from personal entanglements. This can be made possible by utilizing the diverse interests and backgrounds in a typical college class as springboards for discussion. In cooperative tasks which are broad based and representative of the group, a personal problem becomes a group problem. Thus, interests are expanded in new directions.

Conceptual Representation

Conceptual representation is another Piagetian concept which has implications for college reading instruction. In Piaget's framework, children acquire the "symbolic function" early in their development. That is, they acquire the ability to imitate internally as well as externally. Flavell explains that this involves a differentiation of "signifiers from significates"[4] and using one to establish and refer to the other.

It would be rare indeed to find a student at the college level who completely lacked the ability to apply conceptual representation, although the degree to which a student uses this ability varies with the individual. Some college students experience difficulty when reading textbook material in focusing on the past and the future. Most of their efforts are devoted to the present. Thus, they are able to read the text and perform a literal translation or they can record the lecture as given. They are unable, however, to relate the subject matter to past learnings or form hypotheses for future learning. Indeed, much of the representing that is characteristic of college

students is little more than imitation. They are representing the stimulus in symbols, but they are not abstracting from it.

Several techniques can be used to assist students in representing information. The construction of time lines, graphs, charts and tables are examples of pictorial representation which may appear common, but are seldom used by students as study aids. It is the aim of research units to foster representational thought. They will fail to accomplish the desired goal if students resort to copying or paraphrasing the words of writers with no contributions of their own. A substitute for this kind of lengthy assignment for the beginning student is an activity which requires him to read a specified number of sources on a selected topic (no more than three) and relate the views of the authors and his own in an effort to validate a hypothesis. The culmination of this limited-assignment could be a paper or a "lead in" to a discussion. After completing several of these mini assignments, students may feel more confident in tackling a term project.

Structure vs. Content

One of the most profound aspects of Piagetian theory is his emphasis on the structure of learning rather than the content. He believes there are differences in the structure of thought that are not dependent on increases in knowledge. It is not only what one knows, but how he knows what he knows. If a student learns the significance of ten dates in history, he has acquired more knowledge; if he learns how to construct a time line which represents the successive events, he has learned a technique for mastering sequential development. He has devised a new way of thinking about the dates. The structure of his knowledge has changed.

In their book, Developing Questioning Techniques, Carin and Sund have suggested that students be allowed to investigate content material on three

levels: facts, concepts and values.[5] Examples: Facts - What are the political systems of Russia and the United States? Concepts - Compare and contrast the political systems of Russia and the United States. Values - In what kinds of ways do each of the systems affect the life styles of their citizens? Conceptualization of knowledge on these three levels facilitates a manipulation of content resulting in a change in its structure.

Just as reading instructors should encourage the formation of more advanced structures on the part of students in mastering "chunks" of content material, there must be an equal amount of emphasis on assisting them in identifying the structure of a discipline as it is being taught. If students understand the organization of a particular course, the content becomes immediately more relevant and can be organized into manageable units. It is beneficial to have students review a semester's work in an academic course and write their own version of the syllabus two weeks before the final examination. This helps them to place all learning in perspective and to determine the struc- of the course content as they prepare themselves for a culmination.

Conclusion

Piaget has provided a basic conceptual system for understanding the acquisition of knowledge. Since reading is the primary medium for acquiring knowledge in higher education, the value and utility of this theory for college reading instruction extend far beyond the references that have been made here. The chasm which exists between the institutional expectations for college students and the actual abilities of the students themselves can be narrowed considerably through an application of these Piagetian concepts to reading experiences. Moreover, these implications can help to lead college reading away from the "remedial band aid" as it often characterized into a viable mechanism which is indispensable in helping students further their cognitive capacity.

Notes

[1]Lee Odell, "Piaget, Problem Solving and Freshman Composition" College Composition and Communication. Vol. 24 February, 1973. p.38.

[2]Howard Gruber, "Courage and Cognitive Growth in Children and Scientists" in Milton Schwebel and Jane Raph. Piaget in the Classroom. (New York: Basic Books, Inc., 1973). p.81.

[3]Eleanor Duckworth, "Language and Thought" in Milton Schwebel and Jane Raph. Piaget in the Classroom. (New York: Basic Books, Inc., 1973). p.148.

[4]John H. Flavell. The Developmental Psychology of Jean Piaget. (New York: David McKay Company, Inc., 1963), p.152.

[5]Arthur A. Carin and Robert B. Sund, Developing Questioning Techniques. (Ohio: Charles Merrill Publishing Company, 1971), p.69.

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