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LANGUAGE INTERACTION IN THE CLASSROOM

NATURE OF QUESTIONING IN THE CLASSROOM

Teachers are always concerned to ensure children are intellectually challenged, make good progress in learning and do not waste their time at school. Questioning emerges as an effective strategy for challenging students intellectually, making them think independently, reflecting critically and pondering over the multiple possible angles of an issue. Arguably, questioning is the most timeless and fundamental stratagem employed by teachers from Confucius to Aristotle to Descartes to provoke learners. In the past 20 years, the role of the essential question has risen as a curricular compass, setting the pathway for the learner, due in no small measure to the power of models such as Understanding by Design. Questioning in a classroom reflects a concern for responsiveness to the inner dynamics of each class, both as a collective body and as a group of distinct individuals. In philosophical dialogue the interests and concerns of each community of enquiry will determine its course and the degree to which the community is able to evolve as a reflective group. Success often depends on spontaneity in the sense of seizing that which is alive in discussion. Enquiry lessons need to remain responsive to pupil interest, local conditions and events. Questions must be planned well. The planning of enquiry can link with, and be part of, a formal curriculum. In planning for encouraging collaborative enquiry in the classroom teachers have to take children's age and experience into account. Whatever is being learned, a great deal depends on how much previous experience learners have had. In the body of work known as Understanding by Design (***McTighe & Wiggins***, 2004;

Wiggins & McTighe, 2012), it is proposed that education should strive to develop and deepen students' understanding of important ideas and processes so that they can transfer their learning within and outside school. Accordingly, it is recommended that content (related goals) be unpacked to identify long-term transfer goals and desired understandings. Part of this unpacking involves the development of associated essential questions. In other words, questions can be used to effectively frame our key learning goals.Expert knowledge is the result of inquiry, argument, and difference of opinion; the best questions point to hard-won big ideas that we want learners to come to understand. The questions thus serve as doorways or lenses through which learners can better see and explore the key concepts, themes, theories, issues, and problems that reside within the content. It is also through the process of actively "interrogating" the content using provocative questions that students strengthen and deepen their understanding. For instance, a regular consideration of the question "How are stories from different places and times about me?" can lead students to the big ideas that great literature explores-the universal themes of the human condition underneath the more obvious peculiarities of personality or culture-and thus can help us gain insight into our own experiences. Similarly, the question "To what extent can people accurately predict the future?" serves as a launch pad for examining big ideas in statistics and science, such as sampling variables, predictive validity, degrees of confidence, and correlation versus causality.

Some questions are deemed Essential by scholars like ***Wiggins***. Questions that meet all or most of the following criteria qualify as essential. These are questions that are not answerable with finality in a single lesson or a brief sentence-and that's the point. Their aim is to stimulate thought, to provoke inquiry, and to spark more questions, including thoughtful student questions, not just pat answers. They are provocative and generative. By tackling such questions, learners are engaged in uncovering the depth and richness of a topic that might otherwise be obscured by simply covering it. Essential questions reflect the key inquiries within a discipline. Such questions point

to the big ideas of a subject and to the frontiers of technical knowledge. Such questions needed for effective transaction of a lesson in the class have the following characteristics:

(1) Is open-ended; that is, it typically will not have a single, final, and correct answer.
(2) Is thought provoking and intellectually engaging, often sparking discussion and debate.
(3) Calls for higher order thinking, such as analysis, inference, evaluation, prediction. It cannot be effectively answered by recall alone.
(4) Points toward important, transferable ideas within (and sometimes across) disciplines.
(5) Raises additional questions and sparks further inquiry.
(6) Requires support and justification, not just an answer.
(7) Recurs over time; that is, the question can and should be revisited again and again.

Some examples of subject-specific essential questions discussed by ***McTighe & Wiggins*** (2012) are as follows:

Essential Questions in History and Social Studies

- Whose "story" is this?
- How can we know what really happened in the past?
- How should governments balance the rights of individuals with the common good?
- Should _____ (e.g., immigration, media expression) be restricted or regulated? When? Who decides?
- Why do people move?
- Why is that there? (geography)
- What is worth fighting for?

Essential Questions in Mathematics

- When and why should we estimate?
- Is there a pattern?
- How does what we measure influence how we measure? How does how we measure influence what we measure (or don't measure)?
- What do good problem solvers do, especially when they get stuck?

- How accurate (precise) does this solution need to be?
- What are the limits of this math model and of mathematical modelling in general?

Essential Questions in Language Arts

- What do good readers do, especially when they don't comprehend a text?
- How does what I am reading **influence** how I should read it?
- Why am I writing? For whom?
- How do effective writers hook and hold their readers?
- What is the relationship between fiction and truth?
- How are stories from other places and times about me?

Essential Questions in Science

- What makes objects move the way they do?
- How are structure and function related in living things?
- Is aging a disease?
- Why and how do scientific theories change?
- How can we best measure what we cannot directly see?
- How do we decide what to believe about a scientific claim?

Essential Questions in the Arts

- What can artworks tell us about a culture or society?
- What influences creative expression?
- To what extent do artists have a responsibility to their audiences?
- Do audiences have any responsibility to artists?
- What's the difference between a thoughtful and a thoughtless critique?
- If practice makes perfect, what makes perfect practice?

Essential Questions in World Languages

- What should I do in my head when trying to learn a language?
- How can I express myself when I don't know all the words (of a target language)?
- What am I afraid of in hesitating to speak this language? How can I overcome my hesitancy?
- How do native speakers differ, if at all, from fluent foreigners? How can I sound more like a native speaker?

- How much cultural understanding is required to become competent in using a language?
- How can I explore and describe cultures without stereotyping them?

Question can be considered essential when it helps students make sense of seemingly isolated facts and skills or important but abstract ideas and strategies-findings that may be understood by experts but not yet grasped or seen as valuable by the learner.The importance of the question depends upon why we pose it, how we intend students to tackle it, and what we expect for the associated learning activities and assessments. Do we envision an open, in-depth exploration, including debate, of complex issues, or do we plan to simply lead the students to a prescribed answer? Do we hope that our questions will spark students to raise their own questions about a text, or do we expect a conventional interpretation? In other words, if we look only at the wording of a question out of context, we cannot tell whether the question is or is not essential. Consider the question "What is a story?" Clearly, if we pose this question with the intent of having students give a textbook answer ("a story contains a plot, characters, setting, and action"), then the question (as pursued) is not essential in terms of our criteria. However, if the question is being asked to initially elicit well-known story elements but then overturn that conventional definition through a study of postmodern novels that lack one or more of these elements, then it functions in an "essential" manner. The best questions are essentially alive. People ask, discuss, and debate them outside school. They arise naturally in discussion, and they open up thinking and possibilities for novices and experts alike. They signal that inquisitiveness and open-mindedness are fundamental habits of mind and characteristic of lifelong learners. In a more practical sense, a question is alive in a subject if we really engage with it, if it seems genuine and relevant to us, and if it helps us gain a more systematic and deep understanding of what we are learning. However a teacher must guard against pushing students to expected answers. teacher may pose an intriguing and seemingly open question yet expect a pat answer. In the worst cases, instructors display intellectual dishonesty when they ask for

students' opinions on controversial issues but actually seek or highlight responses that they deem politically or morally correct.

Teachers may plan for progress in a general sense in managing discussion and try to focus attention on aspects of participation in a class discussion that will help the class as a whole to do justice to the topics and questions chosen on each occasion. Such planning might look something like the example given below:

Teachers' Questions

Effective transaction of lessons in the classroom entails self-questioning. The teacher must be engaged in asking certain questions to himself/herself about the way he/she transacts a lesson in the class. Some of the common questions considered for critical reflection have been discussed by ***Jack C. Richards & Charles Lockhart*** (1996). They are as follows:

(i) What am I doing in the classroom (method)?
(ii) How can I collect information about my own teaching?
(iii) Why am I doing this (reason)?
(iv) What is the result?
(v) What are my beliefs about teaching and learning and how do these beliefs influence my teaching?
(vi) Where do these beliefs come from?
(vii) How do the learners' beliefs and attitudes influence their approach to learning?
(viii) What learning styles and strategies do the learners prefer in a particular class?
(ix) What kind of planning decision do I make use of?
(x) What kind of on-the spot decision do I make while teaching?
(xi) What criteria do I use to evaluate my teaching?
(xii) What is my role as a teacher?
(xiii) How does this role contribute to my teaching style?
(xiv) How do my learners perceive my role as a teacher?
(xv) What form or structure do my lessons have?
(xvi) How do I communicate my goals to my learners?
(xvii) How effectively do I utilize opportunities within a lesson?
(xviii) What kind of interaction occurs in my classroom?
(xix) What interactional styles do my learners favour?

(xx) What kind of grouping arrangements do I use and how effective are they?
(xxi) What kind of learning activities do I employ?
(xxii) What is the purpose of these activities?
(xxiii) What patterns of language use occur when I teach?
(xxiv) How do I modify my language to facilitate teaching and learning?
(xxv) What opportunities do learners have for authentic language use in my lessons
(xxvi) Will I change anything based on the information gathered and how?
(xxvii) How can I help two children in the class to be less distracted and disruptive and to offer their ideas?
(xxviii) How can I encourage greater depth in discussion without staying for too long on one issue?
(xxix) How can I vary the ways we work in philosophical enquiry to avoid routinism?
(xxx) How can I be more observant during our work?
(xxxi) How can I improve the suitability and variety of my responses to points made in discussion?
(xxxii) Am I catering for the youngest and the oldest children in the class?
(xxxiii) Does it matter that one boy hardly ever speaks in the whole class setting?

Such questions help the teacher to remain alert to certain aspects of children's learning and to direct observation and action during each session. They will also focus the mind for reflection between sessions. At the end of a term's work the teacher may feel it is worth while making notes about each child in the group to add another dimension to monitoring. Another very useful evaluative tool is the recording and analysis of critical incidents (***Tripp*** 1993) be plenty of room for uncertainty and possibilities. These questions for self-analysis generates a process of reflection that may be schematically represented as follows:

Method → Reason → Result → Justification

To achieve the desired outcomes in transacting a lesson the teacher may start a lesson by looking for stories, pictures, animations, poems or objects on the basis of their power to

express ambiguity, to provoke puzzlement and to evoke a deep response. The material should prompt the kind of questions that cannot be quickly settled by observation or by reference to facts. Part of the preparation for the content of an enquiry involves considering a teacher's own response to the material he has chosen. What does he find thought-provoking about it? What questions does it elicit in his mind? What feelings does it evoke? What responses does he/she [the teacher] anticipate from the children?

TYPES OF QUESTIONS AND TEACHERS' ROLE

For facilitating meaningful learning, a lesson should never be transacted in a didactic manner or delivered in a highly academic, uninterrupted and authoritarian mode. Interpretations must be open and fluid and experiences of the students must be taken into cognizance. Probing questions serve as one of the most useful strategies in inspiring critical inquiry and reflection, necessary for a comprehensive understanding of the lesson. The students also feel motivated and can fight boredom if they get actively engaged by seeking responses to the questions framed by the teacher. Questions asked at crucial stages of a lesson can focus students' attention on the critical aspects of the object of learning, create the context that will help students to make sense of the object of learning, and open up the space for exploration of an answer. Through successful and effective questioning, the lesson becomes stimulating and a process of continuous discovery and enlightenment. As a number of scholars have pointed out, effectiveness of a lesson largely depends on the skill of questioning (***Christensen***, 1991; ***Jacobson***, 1984; ***Welty***, 1989). The skill of questioning takes the most practice and skill as professed by ***Freire*** (1993) and ***Bateman*** (1990). ***Palmer*** (1998) has noted that how a teacher asks questions can make the difference between an ineffective lesson and one that turns into a complex and meaningful dialogue bouncing all around the room. ***Heritage*** (1998) identifies three basic dimensions of question form or design that are relevant to his discussion of questioning:

(1) Questions set agendas in terms of the kind of action required of an answerer and the relevant topical domain of such an action;

(2) Questions embody presuppositions; and

(3) Questions can "prefer" certain responses, that is, questions can be designed to favor a certain kind of response over another.

Different types of questions that are framed during transaction of a lesson are briefly discussed below:

(i) Evidence seeking Questions: Questions that prompt a student to furnish evidence or facts and justify his points with valid examples.

(ii) Clarification seeking questions: Questions that compel a student to think critically and logically in order to provide clarification of his points or his stand on any given issue.

(iii) Open questions: Questions to which there is a range of possible answers, or a range of possible ways of presenting the answer.

(iv) Closed Questions: Questions framed and used to check retention or to focus thinking on a particular point. There is only one acceptable answer.

(v) Reversed Polarity Question: Questions that are meant to help students self-correct and also reveal the role of interactional context in the interpretation of question function. The "reversed polarity question" (RPQ), is a yes/no interrogative that is produced after a teacher characterizes a portion of a student's written text as problematic. For instance, if, after indicating that a student's thesis statement is problematic, a teacher says "Is that what your essay is about?," what is conveyed by this yes/no interrogative is the negative assertion "That is not what your essay is about" and, by implication, "It should be changed." Thus, while the RPQ is a grammatically affirmative interrogative (i.e., not a negative interrogative), it communicates a negative assertion, that is, an assertion that has the reverse polarity to that of the

RPQ. The fact that a grammatically affirmative interrogative conveys a negative assertion can be explained, in part, by its interactional environment. It is produced after a portion of a student's text has already been identified as problematic.

(vi) Extension questions: Used for exploring the issues. For example, What else? Can you take us further down that path or find new tributaries? Keep going?

(vii) Alternative Questions: Framed primarily to lead the students to the desired response. May be used for prompting as well. For instance, on being asked a information seeking question if a student answers in negative, the teacher may rephrase the question at a much later stage while teaching the chapter when he thinks that the lesson so far has provided sufficient data / information for the student to reconsider his earlier answer and to think and provide the correct explanation now.

(viii) Hypothetical questions: These questions construct hypothetical scenarios compelling students to think critically and ponder over various possibilities of a given topic. Teachers may use such questions to query the pupil as to how they would "feel, behave, or cope," given such a scenario. According to ***Speer,*** these kinds of Hypothetical Questions force pupils to consider in an explicit way what they are prepared to sacrifice, what they will settle for, and what they will risk in a given situation. It is not form alone, however, that provides a clue to what these Hypothetical Questions are meant to accomplish. They also occur in an interactional environment that is suggestive of their function.

(ix) Cause and effect questions: Framed and used in the class to encourage students to reflect critically and logically upon cause and effect of any given phenomenon. Subsequent questions are framed on the basis on preceding ones.

(x) Synthesis questions: Questions that help to use old ideas to create new ones, and relate knowledge from several areas, generalize from given facts. For example,

What could be done to minimize (maximize)...?[a given phenomenon]

(xi) **Experiential questions:** Questions that compel students to find answers from their experiences. They are good for relating the text to the real life experiences of the pupils.

(xii) **Epistemological questions:** Questions based on truth, belief and justification. Such questions compel a student to justify his claim or answers to a problem and reconsider his /her existing beliefs.

(xiii) **Rhetorical Questions:** Questions framed and used to emphasize a point or to reinforce an idea or statement. Rhetorical questions are often humorous and don't require an answer. Rhetorical questions are often used to promote thought.

(xiv) **Managerial Questions:** Questions framed and used to keep the classroom operations moving. They are beneficial for classroom management.

(xv) **Probing questions:** A series of questions that ideally require the students to go beyond the initial response and subsequent questions framed by the teacher are based upon the students' response to the previous questions. They can be of two principal types, namely:

- ***Convergent Questions:*** Questions, answers to which are usually within a finite range of accuracy. This is to say that layers of questions are framed and used to enable the students to justify their successive responses in the light of the inferences made in the answers given to previous questions. These bunch of questions lead to a central topic or concept.
- ***Divergent Questions:*** Questions that direct the students' thought to exploration of possibilities, and calls for both concrete and abstract thinking. Taking off from an initial question, which may be considered the starting point, a bunch of related subsequent questions are framed and used to inspire further exploration. These include types that are known as Prediction Questions.

(xvi) **Communicative questions:** Helps to propagate a conversation for communication.

(xvii) **Higher Order Questions:** Questions that call for responses that are based on generalizations related to textual information in a meaningful manner.

(xviii) **Evaluative Questions:** Questions that call for answers combining various cognitive and affective levels, mostly in comparative frameworks. Such questions are aimed at development of decisions and testing knowledge.

(xix) **Inferential Questions:** Calls for inductive or deductive reasoning

(xx) **Filter or Contingency question:** Sometimes we have to ask the students one question in order to determine if they are qualified or experienced enough to answer a subsequent one. This requires using a filter or contingency question. For instance, a teacher may want to ask one question if the respondent has ever been to any hill station and a different question if they have not. In this case, you would have to construct a filter question to determine whether they've ever been to a hill station.

(xxi) **Priority Questions:** Popularized by Derek Bok Center for Teaching and Learning, Harvard University. Such questions help the students in refocusing on and reorganizing the priorities in analyzing a given text and think critically. For instance, questions like "Which issues do you consider most important and why? Where would you start?"—channelize a student's priorities and mode of thinking.

(xxii) **Affective Questions :** Questions that elicit expressions of emotions, feelings and values related to the text.

[Managerial, Open , Closed and Rhetorical Question types are mentioned by ***P E Blosser*** (1975). *How to Ask the Right Questions,* National Science Teachers' Association.]

MULTICULTURAL CLASSROOM AND TEACHERS' ROLE

Virtually every person has been socialized by a culture and in many cases by more than one. Cultures may be defined by many factors, such as national origin, gender, religion, occupation, geographic region, sexual orientation, generation, abilities or disabilities, and leisure activities. The extent to which a person identifies with a particular group is often a matter of individual preference and life history, and it frequently shifts across contexts and with developmental and historical changes (***Gollnick & Chinn,*** 1998). Each culture has a particular way of perceiving, evaluating, and behaving (***Goodenough,*** 1976). It "imposes order and meaning on our experiences. It allows us to predict how others will behave in certain situations" (***Gollnick & Chinn,*** 1998, p. 4). All children, to varying degrees, absorb the values of their immediate culture(s). As awareness and sensitivity regarding issues of cultural diversity have increased, educators' interest in incorporating multicultural approaches into educational settings has also grown.

Language is generally understood by multiculturalists to be one of the expressions of culture (***De Gaetano, Williams & Volk,*** 1998; ***Hernandez,*** 1989; ***Nieto,*** 2000), and the deep structures of a culture determine when, where, and with whom particular language variations may be employed. Some literary, educational, and psychological theorists, however, see language as the source and shaper of culture (***Bahktin,*** 1981; ***Dewey,*** 1938; ***Vygotsky,*** 1978) through the social construction of reality. By implication, language thus becomes a critical issue in multicultural work. A critical sociocultural view recognizes that the language skills that result from mainstream practices are not inherently superior to skills that result from nonmainstream practices. Thus, a critical sociocultural view of language and literacy promotes objective examination of literate discourse patterns in different cultures and avoids ethnocentricity and negative judgments about the value of specific language skills that result from such patterns.

The move toward infusion of multicultural perspectives throughout curriculum and teaching practices in child care and

educational settings for young children has not always been a straightforward one, nor has it proceeded to the same degree of implementation in every instance. ***James Banks*** (1999, p. 31) identifies **four levels of practice,** which are distinguished by the degree of integration of multicultural content and processes and the ultimate aims of the approach:

(i) The Contributions Approach (focusing on heroes, holidays, and discrete cultural elements). An example of this approach would be the celebration of birthday of Babasaheb Bhimrao Ambedkar as an event without integration of the history and meanings behind that day into the activities done with the children across subjects throughout the year. Another example would be the promotion of multicultural food fairs, without the students' study of the significance of these foods in the past and presentlives of the groups who originated them.

(ii) The Additive Approach (adding content, concepts, themes, and perspectives to the curriculum without changing the curriculum's structure). This approach might be seen in the addition of books by authors of marginalized people to an existing list of required readings in a literature program, without examination of their import for the total construction of the program.

(iii) The Transformational Approach (changing the structure of the curriculum to enable students to view concepts, issues, events, and themes from the perspective of diverse ethnic and cultural groups). Here teachers and school administrators examine the whole curriculum and expand or reshape the content to represent multiple points of view, with awareness of the issues of power and oppression that influence what content is considered most valuable and of greatest use to children living within a particular society.

(iv) The Social Action Approach (enabling students to make decisions on important social issues and take action to help solve them). Examples of this approach would be kindergartners' working under their teacher's guidance to make new classroom rules to ensure that both boys and

girls have access to all different types of materials in their classroom and sixth-graders studying consumerism as a way of reexamining what impels them to see brand name clothing as a marker of social success.

Some other effective techniques for teaching in a multicultural classroom are—

(i) **Collaborative Learning:** Collaborative learning a system in which two or more people cooperate in a learning experience to share and contribute to each member's understanding of a topic and to complete a given task. Collaborative learning helps to develop Multicultural competency among the students.

(ii) **Cooperative Learning:** Cooperative learning is termed as a learning way in which the students learn in groups. In this type of learning the students interact with each other and build upon their school relationships, which is different from the traditional way of teaching. The main idea behind cooperative learning is to teach the students to be a functional part of a group so that they have grouped responsibilities as well as individual responsibilities. This type of learning not only increases the study skills of a student but also develops the communication skills. This type of learning is essential in Multicultural society.

(iii) **Use of Multimedia:** Multimedia is the combination of various digital media types such as text, images, audio and video, into an integrated multi-sensory interactive application or presentation to convey information to an audience. This helps the teacher to represent the material in more meaningful way. In this type of teaching languages will not be barriers. So this is useful in multicultural society.

(iv) **Mind Mapping/Concept Mapping:** A mind map is a diagram used to represent words, ideas, tasks or other items linked to and arranged around a central key words or idea. A concept map is also a diagram used to represents more than one idea together. Mind maps are used to generate, visualize, construct and classify ideas. These are can be use for solving problems, organizing information,

evaluating performance and taking or making notes. Therefore it can be use effectively in multicultural society.

(v) **Think Tank Session:** Think tank session imply joint or collective loud thinking on a common issue or problem. The purpose of this approach is to reflect in- depth on a topic. In this approach students are divided into groups of 10-15 students. Procedure is explained to them. These are such which force the students to think differently on the same theme provided to all. This will help to develop Multicultural competency among the students.

(vi) **Blended Learning:** Blended learning describes an approach to learning where teachers use technology, usually in the form of web-based instruction as a supplement to live instruction. It is commonly combines traditional teaching and learning approaches with Information and communication technologies.

(vii) **Co-curricular and extracurricular activities** should be planned accordingly as well.

In her analysis of the **theoretical foundations for preparing teachers to be multicultural educators,** ***Kendall*** (1996) draws upon the work of ***Wurzel*** (1988), who describes seven stages in the development of an individual's multiculturalism. A very complex process is entailed in becoming an authentically multicultural teacher, a process that involves self-transformation as much as acquisition of professional proficiency.

(i) **Mono-culturalism:** According to ***Wurzel,*** initially, persons who have lived without any contact with persons racially, culturally, or otherwise different from themselves are in the stage of mono-culturalism. At this point of departure, people have no awareness that value and belief systems, traditions and life practices, and even the common material elements of people's day-to-day lives can validly differ from one another. ***Kendall*** points out that the underlying assumption here is that there is only one correct perspective and that variation is fundamentally deviant. It can be surmised that teachers in this stage do not implement a multicultural curriculum in any form, as they

do not recognize its validity or importance in promoting development and learning in children.

(ii) Cross-cultural contact: The second stage ***Wurzel*** describes is that of cross-cultural contact. At this point, teachers may have had some limited exposure to people whose cultures are different from their own and may regard those experiences positively. We can imagine their relating their experiences to the kinds of exposure that they consider good for the children in their classrooms and consequently using the contributions approach-highlighting the achievements of a famous person from a specific cultural group or introducing cultural elements such as particular foods or music from that group. Thus, curricular resources that emphasize such contributions may have a particular appeal at this stage of a teacher's work.

(iii) Cultural conflict: Teachers may be propelled into Wurzel's third stage, cultural conflict, by the realization of challenges to their own beliefs and values in the contacts they have had. Teachers may feel confused about what content is worth pursuing (a "standard" curriculum or one with multicultural additions).

(iv) Multi-culturalism-educational interventions: The fourth stage is a movement toward multi-culturalism educational interventions. In this stage, teachers seek new information to extend what they have previously known. They are aware that culturally specific knowledge exists (or even that knowledge may be constructed differently in different cultures), and they seek to expand their knowledge base.

(v) Disequilibrium: The fifth stage is disequilibrium. One may learn that what one has always held to be true (a cherished image of the fair and equal treatment of all cultural groups in the United States, for example) is not in fact the case. Such revelations are likely to propel teachers into disequilibrium. teachers discover new realities and the ways that these have affected both their own lives and those of the children whom they teach. As they struggle

with these, one can suppose that they may become interested in curricular resources supplying multiple perspectives on issues, in a continued effort to expand their knowledge and transform their thinking about the dynamics of cultures both in their society and in their educational and care practices.

(vi) Awareness: The sixth stage is awareness. As teachers work through their disequilibrium, they understand that it is not enough to add cultural elements to an existing curriculum, but that the curriculum must be redesigned from the bottom up, with full attention to the inclusion of multiple perspectives and experiences, varying constructions of knowledge, and a range of strategies that supports the development and learning of the children in their classrooms.

(vii) Achievement of multi-culturalism: At this stage, thought and action are united beyond the acts of teaching and learning in classrooms to connect directly to activism within thelocal, national, or global community in service of social justice.

Ramsey & Williams show in their book *Multi-Cultural Education:* A Source Book that—

"The foundation for multicultural practice is generally seen to be teachers' examination of their own belief systems around issues of race, culture, class, gender, sexual orientation, ability/ disability, and other diversities and their consequent expectations for children (Bennett, 1999; De Gaetano, Williams, & Volk, 1998; Derman-Sparks, et al., 1989; Garcia, 1999; Kendall, 1996; Miller-Lachman & Taylor, 1995; Nieto, 2000; Ramsey, 1998; SaponShevin, 1999). The expectation here is that teachers will confront a lack of specific kinds of knowledge and skills, as well as bias, within themselves. They would then work vigorously to overcome both those insufficiencies and their negative feelings, with full awareness of ways these might otherwise influence their practice."

The formation of a community of effort in partnership with parents and with other teachers, as well as with the children in the class, is identified as a factor vital to the success of the

approach (De Gaetano, Williams, & Volk, 1998; Hernandez, 1989; Miller-Lachman & Taylor, 1995; Ramsey, 1998).

The intention is to build a fund of cultural knowledge that goes beyond the experience of any one person to ground both curriculum content and teaching strategies.

A third process commonly cited is that of re-envisioning the classroom environment to reflect the daily life experiences and cultural knowledge that the children, parents, and teachers bring with them into the classroom (Davidman & Davidman, 1997).

A careful study of the content of the texts used by children in each field of study-literature, social studies, science, mathematics, art, music, and others—is important to see that they are accurate (have not left out part of or distorted the story told, in order to represent a dominant interest) and, whenever possible, represent multiple perspectives on issues under consideration (Banks, 1996; Bennett, 1999).

Building on preparation of the classroom environment and curriculum content, the processes of curriculum planning, implementation, and assessment of student learning must be given rigorous attention in classrooms that use multi-cultural approaches (Bennett, 1999; Davidman & Davidman, 1997).Cultural histories, particular elements of culture, and the day-to-day lived experience that children bring with them into the classroom must be given importance. Teachers should be careful in using the culture-specific materials and resources, but in a way so as not to over-generalize and stereo type in an effort to be culturally responsive.

Goals and Philosophical Orientations of Multi-cultural Education

Banks (1999) suggests that the goals of the four approaches can be viewed through the lenses of the following five dimensions, which reveal the complexity of multi-cultural education:

(i) Content Integration: Content integration deals with the extent to which teachers use examples and content from a variety of cultures and groups to illustrate key concepts, principles, generalizations, and theories in their subject area or discipline.

(ii) Knowledge Construction: The knowledge construction process relates to the extent to which teachers help students understand, investigate, and determine how the implicit cultural assumptions, frames of reference, perspectives, and biases within a discipline influence the ways that knowledge is constructed within it.

(iii) Equity Pedagogy: An equity pedagogy exists when teachers modify their teaching in ways that will facilitate the academic achievement of students from diverse racial, cultural, gender, and social-class groups. This includes using a variety of teaching styles that are consistent with the wide range of learning styles within various cultural and ethnic groups.

(iv) Prejudice Reduction: This dimension focuses on the characteristics of students' racial (or other) attitudes and how they can be modified by teaching methods and materials.

(v) Development of an Empowering Institutional Culture and Structure: Grouping and labeling practices, patterns of sports participation and academic achievement, and the interactions of the staff and the students across ethnic and racial lines are among the components of the school culture that must be examined to create a school culture that empowers students from diverse racial, ethnic, and cultural groups.

Dimensions beyond those Banks discusses include the following:

(i) Identity formation and other psychological processes that affect personal growth and development (Tatum, 1997; Timms, 1996) and

(ii) Political processes that affect societal growth and development (Ovando & McLaren, 2000).

The goals of multi-cultural practice implicit in Banks's approaches and dimensions are reflected in another way of categorizing curriculum and teaching resources that originated in work done in 1987 by ***Christine Sleeter*** and ***Carl Grant.*** Review of a large number of resources then available revealed at

least five philosophical positions related to overall purposes and goals of multi-cultural curriculum and teaching resources. ***Sleeter & Grant*** (1999) have forwarded five factors of multi-cultural education:

(i) Education of the exceptional and culturally different child (intended for racial, ethnic, ability/disability, or other groups that are not achieving at a high level and aimed toward assimilation of those populations)

(ii) Single group studies (formerly called "ethnic studies" by these authors, which may be intended for all students or ethnic minorities only and which treat particular groups as distinct entities in separate curricular segments)

(iii) Human relations (focusing on intergroup cooperation for all children)

(iv) Multi-cultural education (designed for all children and emphasizing the positive, adaptive value of cultural pluralism, while encouraging children's competence in more than one cultural system); and,

(v) Education that is multicultural and social reconstructionist (a more fully articulated orientation toward change of the deep structures of society that foster unequal relationships among distinct groups).

The fifth is the most far-reaching of the approaches and speaks to a focus on social justice. Like the fourth, it implies infusion of a multi-cultural perspective throughout the entire curriculum. The first three formulations, on the other hand, are more likely to take the form of self-contained or "add-on" curricular activities. The fourth and fifth approaches have been increasingly represented in the literature over the decade of the 1990s.

5

NATURE OF READING COMPREHENSION IN THE CONTENT AREAS

READING PROFICIENCY IN THE CONTENT AREA

The teaching of reading in the various curriculum areas is considered by many a secondary task, merely supplementary to the work of the reading or English class. Persons holding this view recognize that the subject fields present unique reading problems. Thus, science, the social studies, and mathematics have their own special vocabularies. A pupil's attack on verbal problems in arithmetic must be quite different from his approach to an expository paragraph in science or a narrative paragraph in history. Each type of subject matter calls for a special set of reading attitudes and skills which may be taught in connection with a specified subject. Regarded in this light, reading is an essential but subsidiary tool in the teaching of any prescribed content.

Teachers in the various curriculum areas are largely responsible for the development of reading ability. It stresses the fact that reading is central to most school subjects and important in nearly all of them. It considers the processes of reading and thinking as inseparable. Although a modern, enriched curriculum embraces many nonreading experiences in all areas of study, reading remains the major source of knowledge, stimulation, insight, and pleasure. In this sense reading may be called the core of the curriculum. The expanding vision of each child who looks upon his surrounding world of people, events, and things necessarily involves increasing mastery of verbal symbols. The clarity and reach of his vision will depend on his ability to interpret verbal symbols as they appear in print. For this reason, all teachers who make use of printed matter as

a teaching aid have responsibility for cultivating the student's ability to enrich his stock of meanings through reading.

Reading is not an end in itself, of course; but it is a means to the achievement of many ends. However, a continuing interest in reading in a given area may well be an important objective of instruction in any of the subject fields. The awakening of a desire for more knowledge about any scientific topic, historical person, or contemporary problem is usually a more important outcome than the mere retention and recall of specific facts included in the reading assignments. Therefore, the organization of instruction in a content field calls for a strategy designed to initiate extensive and pleasurable reading on appropriate topics.

The kinds of reading guidance offered in language classes are needed also in the other curriculum areas. Word recognition, sentence comprehension, getting the main idea of a passage, noting specific details, reading with a purpose, following directions, critical reading, all are involved wherever the instructional resources include reading. No teacher can safely assume that such specific skills and abilities will automatically transfer to the special fields of study. Nor should he assume that those skills can be used in his field without adaptation or extension.

The variety of reading ability demanded by modern life calls for co-operative effort on the part of teachers in all curriculum areas. The mass media of communication, among which newspapers, books, and magazines still occupy a place of great importance, deal with every aspect of human concern, growth in reading skill and interest goes hand in hand with growth in the understanding of our world.

The nature of young people's experiences with reading in the various subject fields will in large measure determine their growth in reading ability. If these experiences, which represent so large a part of a child's life in school, are frustrating or lacking in challenge, no effort on the part of teachers of reading and English can fully overcome the immature reading habits or attitudes engendered in the content fields. The school program must be a co-operative one involving the constructive efforts of all teachers.

In their study of maturity in reading, Gray and Rogers found that one of the most significant characteristics of the mature reader is his possession of "a focus, or radix, of interest to which much of his reading relates and which serves as an inner drive or motivating force. "Barnouw makes a similar point when he writes of the focused audience in mass communication. Reading in this sense becomes an active, selective, creative process, embracing all the vital concerns of the mature individual. To the development of such reading, the contribution of every curriculum area is essential.

The relation between reading ability and progress in the content fields is a reciprocal one. An effective instructional program in the various curriculum areas can markedly contribute to young people's reading growth, while at the same time competence in reading promotes effective use of content in the subject fields.

Time used for guiding reading is considered as detracting from the attainment of the goals of these fields.

The view that specific reading skills and abilities will automatically transfer from one field to another is contrary to the findings of research on this problem. Fay studied the ability of 384 sixth-grade pupils who were required to use five reading skills in each of the subjects of arithmetic, social studies, and science. The skills which he studied were those of predicting outcomes; understanding precise directions; comprehension; reading maps, charts, and tables; using indexes, references, and dictionaries. On the basis of these tests, Fay concluded that reading is not a generalized ability but a composite of many specific skills and that the skills he studied were more directly related to the reading demands of the social studies than to those of arithmetic or science. After reviewing twenty-five recent studies of reading and critical thinking, Husbands and Shores concluded that, in the upper grades of the elementary school and in secondary schools, reading is differentiated into abilities to do specific jobs for specific purposes within selected content areas. Thus, reading is not a generalized skill that, once developed in an English class, can be applied in a special field. Rather, reading involves the ability to interpret this or that particular

area of experience. Basic instruction, no matter how excellent, is not enough. Reading abilities must be developed in the areas where they are to be used.

The important purposes that the reading should serve vary from field to field. Great variations appear in the nature of the reading materials and in the students' readiness to interpret them. For one kind of reading a student may possess definite interest and motivation, experiential background, and clarity of purpose, but for another kind he may not have any of these advantages. Ragsdale has offered the following explanation:

[The reader] who clearly understands the purpose of his reading, who sees the relation of that purpose to his interests and his needs, who is taught to read for a variety of purposes, is a motivated and successful reader. He will succeed because the job to be done is clear, because he knows when the job is completed and because the variety of his purposes heightens interest and prepares him to use his reading abilities in the numerous ways required in the varied types of reading in which he engages Oral reading.

—Though teachers in the curriculum areas generally use silent reading far more than oral reading, there has been a tendency at the elementary level to depend upon oral reading whenever pupils experience difficulty. For example, pupils have been asked to take turns in reading orally in class from science, history, geography, and social-studies textbooks. Sometimes the teacher has endeavored to clarify the ideas by interspersing questions, comments, or brief discussions among the readings. Though such an oral approach represents a sincere attempt to help pupils overcome their difficulties, it has two serious disadvantages. First, this temporary expedient rarely improves reading ability in the field. Second, it does not help the pupil become an independent learner. A better approach is to ask why the students fail to get meaning from their silent reading.

More than fifty years ago it was shown that oral reading is much slower than silent reading. A mature reader can read orally no faster than his rate of articulation, but he can read silently as fast as he can comprehend the ideas. In everyday life, oral reading

is used far less often than silent reading. In addition, comprehension is not so good in oral reading as in silent reading.

For the most part, then, reading in the curriculum areas should employ silent-reading skills. There will be times, of course, when oral reading is advantageous. These occur chiefly in the presentation of unfamiliar ideas to a group or a class. Examples are reading aloud to prove a point; to present information that contributes to the solution of a problem; to share a selection for sheer enjoyment or appreciation; or to present a dramatic dialogue, a play, a pantomime, or a movie. In the main, however, the reader's first obligation is that of understanding the author's meaning through silent perusal of the page.

SCIENCE

Students of all levels have difficulty learning science through reading. A common mistake is to assume that students can read science selections independently. Most students arrive at the science teacher's classroom knowing how to read, but few understand how to use reading for learning science content. Given that science texts are used in most secondary science programs, the science teacher faces some unique challenges. Part of the challenge derives from the nature of the content area. Few students have the background knowledge to learn information from science texts. There is too much unfamiliar content for students to grasp without some pre-reading instruction. Researchers have consistently documented that the amount of knowledge students bring to a reading situation will influence what they learn from the assignment.

One challenge is the text itself. Many science texts are not written very clearly. The teacher and students need to take on an editorial role to understand the author's method of presenting information. When students understand how text is organized and written, they can use it more effectively.

Another challenge is the student's knowledge of comprehension and learning strategies. Few students understand how to organize information for learning. Most are able to read their text, but few know how to study and learn from it. All of

us can give eloquent lectures and assign reading to students without showing them how to learn. We falsely assume that students can learn how to learn on their own or that it is not our responsibility.

We must continually evaluate our goals as teachers. Do we want students to leave our classrooms with only a collection of facts what will be rapidly forgotten, or do we want them to have a background in science along with the ability to continue learning beyond the confines of our classroom? Instructional goals must be long term.

The content, the text, and the student interact to create instructional challenges for the science teacher. Reading, whether or not it comes from a text, a magazine article, or a nonfiction library book, plays a role in science instruction. For all reading assignments, students need to have an understanding of the author's plan of presentation so that they can use the plan for organizing and learning the information. Once students understand how main concepts are presented, they can begin to use the author's plan to organize information for learning (***Slater & Graves,*** 1989). Most scientific writing is plagued with inadequate explanations and extraneous information (***Halliday,*** 1991). Even with these potential difficulties, it is important to teach students that they have some control over their text. The teacher's task is to help students discover how their reading assignments have an organizational framework for learning, even if the author's plan is not altogether effective.

Instruction must progress from teacher demonstration and discussion to guided practice and finally to independent application. We may begin by showing students how to read the text and make an overhead transparency of the selection for demonstration. The teacher may then read the selection aloud and describe how you use the author's clues such as introductory statements, rhetorical questions, bold print, and italics. Underline these clues on the transparency as he reads and go on to talk about how the author develops main ideas and details, and describe the author's style of paragraph development. He may point out areas that might cause reader difficulty, such as poorly defined concepts, unlabeled diagrams, and lack of elaboration in explanations.

Given below is an example of an introductory teacher explanation (what the teacher may tell her students as an introduction) :

In order to learn science concepts from a book, nonfiction article, or chapter from a textbook, the first thing to understand is what the author does to help you learn. We are going to figure out the author's plan. What is the author's style of main idea development ? Science writers have a plan. If you can figure out the plan, you can use the materials more effectively. Let's read the introduction together. As we read, we are going to make a list of what the author does to help us learn. For example,

(i) The author uses bold font for important words,
(ii) The author uses transition words like first, second, and third to write clear explanations
(iii) Pictures and charts are used to explain the vocabulary
(iv) The author uses paragraphs to distinguish between important concepts/new concepts
(v) The author uses italics to emphasize important points
(vi) Sub headings are used for new points/concepts

When reading other selections by the same author, the teacher should remind students about the author's plan. Most authors have a consistent style of presentation. Then the teacher would show students how to use the author's plan for selective underlining, building notes, or summarizing. After he/she has modelled how to read an assignment, he should begin releasing more responsibility to students. For example, he could divide them into groups and make each group responsible for demonstrating their reading of difficult selections. Students also can take on the role of an editorial review board and analyze the strengths and weaknesses of the material. The teacher could have each group report their conclusions and come up with suggestions for reading the material more effectively. The teacher may come up with comments such as these: ignore extraneous material, look for main ideas, take notes, and write down questions about unclear ideas. The teacher should provide opportunities for students to describe their own reading strategies and to realize the variety of approaches they can call on for comprehension. Another idea is to have students read

the introduction, boldface topics, and conclusions. From this information they can predict and outline the probable text content. After reading, they can revise their outlines. This approach teaches awareness of chapter organization and focuses on how well the author follows through with an organizational plan. Moreover, student committees can take particularly poor sections of the text and revise the material so that it is well written.

Instructional Strategies

An example or model lesson may clarify matters. We may take a chapter on flower reproduction as an example. As in many science texts, the material on flower reproduction is loaded with vocabulary that is tersely explained with little elaboration. Left to their own devices, most students would have difficulty reading this assignment. Before beginning instruction, the teacher must have a clear idea about his/her content goals and make sure students have a notebook or journal for writing. Let's say that the teacher wants his students to learn the following three major concepts in our hypothetical text assignment: (1) the parts of a flower and their functions, (2) variations among flowers, and (3) photoperiodism. Section 1 in the text includes the parts of a flower, and Section 2 describes the variations among flowers and photoperiodism. Because students must know the parts and functions of flowers before they can understand flower variation and photoperiodism, the teacher should divide the assignment into two sections and incorporate pre-reading activities before students read each of the parts. With this in mind, any of the following pre-reading activities would be appropriate:

(i) The teacher could have a variety of flowers in the classroom (he could make arrangements by talking to a local florist about sending flowers that are normally thrown away) and place flower books throughout the classroom. He could then discuss favorite flowers of the pupils. The he could give each student a piece of blank paper and list vocabulary words on the board with coloured chalks: stamen, sepal, carpel, receptacle etc. Working in laboratory groups, students dissect flowers, draw the various parts, list the parts that appear similar in all flowers, and then draw a generic flower with those observed parts. Students predict the function of each part. They write their predictions in their science journal. As they read, they label the parts and write a sentence describing the function in the blank paper provided earlier. Students read their entries to one another. A class discussion follows in which the teacher reviews the parts and functions of flowers and answers questions. Students revise their journal entries.

(ii) The teacher draws a generic flower on the board and lists the vocabulary words in chart form. The class brainstorms what they think might be the location and function of each part. They label the parts they know and generate ideas about each part's function. Students then read and revise the chart. After reading, the teacher leads a discussion and fills in the master chart on the board. If there is little information on function in the assignment, students can add information regarding function by examining additional resource materials in the room.

Prereading Activities for Variations and Photoperiodism

(i) The teacher may write the words "angiosperms," "monocots," and "dicots" on the board. He can then remind students that they learned the definitions of these words in the last chapter and then lead a discussion until the meanings are clear. Then he can write the phrases "perfect flowers" and "imperfect flowers" and have students hypothesize definitions for perfect flowers and imperfect flowers and write down in their journals their prediction about their meaning. He can then ask students to read the subtopic "Photoperiodism and Flowering" and guess what these words mean. He may give the students clues by dividing the words photoperiodism into components: photo and periodism. The teacher may also brainstorm possible definitions for each word part. Again, he can have them record their hypotheses in their journals. Next, students read and revise their journal definitions.

(ii) Conceptual mapping/Concept mapping, a system for organizing main ideas and details into graphic or pictorial form, works well as a prereading activity. Conceptual

mapping instills active comprehension and dynamic discussion. The teacher writes the word "angiosperm" in the middle of the board or on a transparency. After discussing the meaning of angiosperm, the teacher ask students to brainstorm ways that angiosperms might vary. The prereading discussion is summarized in the form of a map. The map is similar to an "octopus outline"; the main idea is in the middle and the details radiate out from the hub. After completing the prereading discussion, the students read the selection to learn more about the variation among flowers. Then they revise the map to include information from the selection.

Reading and Post-reading Strategies

Some additional ideas for helping students organize information from **their reading are** selective underlining, two-column notes, and conceptual mapping.

Selective Underlining

Underlining is a powerful tool for processing main ideas if students know how to underline. Novices typically take their magic marker and hemorrhage across the page, underlining almost every single line. They need to be taught to detect the main points. Because students cannot write in their text, use consumable materials such as magazine articles, laboratory manuals, and photocopies of reading assignments (***Santa & Havens,*** 1995). The teacher could begin with a demonstration. He can photocopy the selection for the students and make a transparency of the assignment and demonstrate how to underline the material selectively by highlighting key ideas, capturing the essence of the material. He may talk aloud, explaining the underlines. Students underline their photocopy as the teacher demonstrates. As he underlines, he must develop guidelines with the class for students to use when underlining on their own. Sample guidelines might include (1) underline key ideas, (2) do not underline a whole sentence, (3) put an asterisk by underlined main points, and (4) make up study questions over main points. Students will need several demonstrations before they can succeed independently.

An intermediary step is to divide students into groups of two or three. The teacher may give each group a transparency containing the selection from their reading assignment. Each group selectively underlines the material on the transparency and then presents their underlines on the overhead for class discussion. They may ask the following questions and discuss among themselves:

(i) What information is important on this page? Let's read the first paragraph again. What has the author included in the introduction? Is she letting us know what we are going to learn?

(ii) What is this author's style of writing? How does she let you know what is important? It seems the author introduces main points through questions. Rhetorical questions are a common pattern of main idea development in science selections. Let's read further. Does the author then answer her own questions?

Once students have success underlining key points and details in their reading, the teacher can begin assigning students to underline assignments on their own.

Two-Column Notes should be a part of every science curriculum (***Santa & Havens,*** 1995). This form of note taking provides a simple system for organizing information and encourages self-testing. Students learn two-column note taking most easily if they have some instruction in analyzing the structure of their text and in noting main ideas and details through selective underlining. In fact, it is often a good idea to introduce two-column notes with material that students have already underlined. The teacher can make a transparency of a selection and talk aloud while he demonstrates. He may have students divide their paper lengthwise into two columns. As noted in the following example, the left column contains key words naming an essential concept or main idea, and the right portion elaborates on main points. Then, covering the information on the right, students can test themselves using the key words on the left.

Parts of a Flower—

Receptacle	Modified stem
Sepals	Leaflike petals and base of flower
Calyx	Made from petals to form protective coating for outer flower
Corolla	All petals together

Male parts of a flower—

Stamens	Slender knoblike ends
Anthers	Knoblike ends of stamens
Filament	Thin stalk that supports anther

SOCIAL SCIENCE

The last decade has seen the continuous development and use of reading strategies designed to improve student learning in the various subject areas. They range from activities that activate or assess prior knowledge to activities that facilitate learning from text (***Beck & McKeown,*** 1991; ***Ogle,*** 1986; ***Peters,*** 1990). Research investigating the overall effectiveness of these strategies is unambiguous, it makes a difference in what and how students go about learning from social studies materials (***Camperell & Knight,*** 1991). From this vantage point, strategy and skill instruction in the social studies is progressing well. However, there are ominous clouds on the horizon. Although the repertoire of reading strategies has increased, these strategies have not always been used to promote significant and worthwhile understandings. Content is often taught as a parade of disembodied facts that emphasize coverage of large quantities of information. Consequently, reading activities that help students learn thin and superficial information are not helpful; they detract from the primary goal of social studies-promoting civic efficacy (***Kaltsounis,*** 1987; ***Newmann,*** 1992; ***Parker,*** 1991; ***Parker & Jarolimek,*** 1984). The bottom line is that reading activities must be consistent with broad curricular goals and outcomes. If not, reading skills instruction becomes a series of decontextualized activities that do not promote the goals of the curriculum.It is time that content and process came together. Those who teach social studies cannot ignore what reading research and practice suggest about how to improve learning

from text, and reading educators who know about enhancing learning from text cannot avoid the quality of content issue raised by social studies educators. If we are to link reading skills and strategies to important social studies curricular goals, we must keep in mind three axioms:

(1) The quality of reading strategies is inextricably linked to the quality of the content;
(2) Reading strategies must be selected in a systematic manner;
(3) Not all strategies for improving reading comprehension are created equally.

The connection between developing and promoting quality learning and how this can be accomplished through reading activities that model thoughtful learning emerge as crucial factors.

Developing more thoughtful reading activities requires two important steps.

(i) The first is the identification of the powerful ideas that underlie the content to be learned.
(ii) Second is the identification of the strategies that promote the learning of powerful ideas.

When this is done, reading strategies become tools to help expedite Comprehension which do not interrupt the flow of content by introducing unrelated skills. Skills become part of the lesson when they are needed and thus can be used in natural and authentic applications. It is essential that reading activities avoid superficiality by using powerful concepts to form powerful generalizations. By their nature, powerful ideas and powerful content are integrative and help students form and develop deeper and richer understandings. This is critical for improving comprehension of informational materials such as social studies textbooks. Powerful ideas build knowledge that is the basis of making connections. In addition, they create a network of associations linking new input to prevailing knowledge and beliefs anchored in concrete experiences. As a result, they do not leave students with disconnected bundles of information. When reading activities are thin or superficial, they emphasize coverage of large quantities of fragmented information.

In order to promote the type of learning that has value and meaning beyond the classroom, social studies teachers must use activities that foster critical reading. Good critical reading skills help foster reflective inquiry, problem solving, and decision making by helping students focus on actual life applications.

To promote this type of learning, reading activities must advance three types of knowledge—

(i) Foundational,
(ii) Generative, and
(iii) Authentic.

These three types of knowledge are important because they serve people well in later academic and nonacademic pursuits by empowering students to move beyond the narrow confines of the classroom.

(i) ***Foundational knowledge:*** It is built by using reading skills and strategies to help students become better at extracting important ideas from the materials, connecting events through causal reasoning, forming more complex conceptual systems, and identifying problems and solutions.

(ii) ***Generative knowledge:*** It leads to the active use of knowledge and skills, because knowledge and skills in themselves do not guarantee understanding. According to Perkins (1992) generative knowledge "does not just sit there but functions richly in people's lives to help them understand and deal with the world" (p. 5). Generative knowledge promotes the use of authentic knowledge.

(iii) ***Authentic knowledge:*** It develops when skills and strategies connect information from the text to the larger social context in which students live. Connections are sought between students' lives and the content of social studies, between principles and practice, and between past and present. This type of knowledge requires students to think through concepts and situations.

Reading skills and strategies must contribute to the development of all three types of knowledge. The development of all three types of knowledge is easier to obtain when activities are part of a larger unit of study rather than isolated from one another. To ensure that the activities promote significant and worthwhile learning that is connected and not fragmented, it is a good idea to use a focus question.

A focus question establishes a clear purpose for reading and learning and helps students connect powerful concepts, themes, and generalizations that are embedded in all three levels of knowledge.

Using Reading Skills and Activities That Develop Foundational Knowledge

At the foundational knowledge level, reading skills and activities should help students build the requisite knowledge base that moves them to deeper and richer levels of understanding. As research conducted by ***Spoehr & Spoehr*** (1994 pp. 73-74) suggests, when historians read they must be able:

(1) To imagine themselves in situations unlike anything they are likely to experience.
(2) To develop hypotheses about cause and effect, allowing for the possibility that a cause may be quite remote from its effect in time, in category (social, political, economic), or both.
(3) To assess how well their hypotheses fit the facts, recognizing that reality is messy and that there will always be counter arguments available that will seem to contradict their hypotheses, and that they must take those counter arguments into account.
(4) To define abstractions precisely, and to show how those abstractions, when used and defined by others, have changed their meaning over time.
(5) To articulate their own values precisely, making sure that they are positing an opinion and not merely projecting an attitude, and that their conclusions follow logically from the evidence.

What this means is that reading skills instruction must help students make explicit the implicit relationships between important ideas and concepts. This is done by helping students make basic connections between their experiences and the texts they are reading. To ensure that this happens, students need to build on the knowledge they already possess so they can more

readily make connections among important ideas. They must also be able to recognize what is in the text and arrange the ideas in meaningful relationships. This is not always easy because students read too quickly over important information without realizing its importance. Finally, students must be able to make new connections and apply what they have learned to new situations. Therefore, these activities should help students pull ideas from the material they are reading so they can engage in historical reasoning, think through cause-effect relationships, use facts to draw conclusions, reach sound historical interpretations, and conduct historical inquiries and research leading to the knowledge on which informed decisions in contemporary life can be based. This type of reasoning is dependent on the ability to construct meaning from the materials students read.

Reading Guides

Reading guides identify explicit skills students need to construct meaning. Reading guides provide a variety of functions. They—

(1) move students to deeper levels of understanding by helping them organize the information they pull from the text;

(2) help students interpret, analyze, and manipulate information in nonroutine ways;

(3) show how to use facts to make interpretations and draw conclusions;

(4) help students make more complex comparisons that offer insights into complex problems;

(5) help students learn how to anticipate counter arguments, weigh alternative explanations, and understand why one interpretation may be preferable to another.

Reading Activities for Foundational Knowledge

Key questions framed by the teacher may show students how to perform the type of reading and reasoning required to pull out major events and link them to the causes of the Sepoy Mutiny, placing these events into a historical problem-solving context so they can extract a lesson that can be applied to a contemporary situation.

Using Reading Skills and Strategies to Build Generative Knowledge

At the generative knowledge level, reading skills are used to advance higher-order thinking. This is done by constructing reading guides that help students:

1. Solve a problem that cannot be resolved through the routine application of previously learned foundational knowledge.
2. Consider multiple perspectives when analyzing controversial issues related to the interpretation of the causes of the Civil War.
3. Analyze counter arguments that require moving beyond the accumulation of foundational knowledge to using knowledge more discriminatively.
4. Examine events over time to understand the difference between immediate and longer impact of historical events.
5. Understand how facts can be grouped in more than one category (e.g., social, political, economic interpretations).
6. Check the consistency of facts in a stated position.

Students who have problems reading social studies materials and completing tasks that require the use of generative knowledge sometimes have difficulty sorting through the many details and facts associated with important historical events like those surrounding the outbreak of the Sepoy Mutiny. Frequently, this means trying to answer complex questions without possessing the appropriate skills or strategies.

Using Reading Skills and Strategies to Build Authentic Knowledge

Authentic knowledge develops when skills and strategies connect information from the text to the larger social context in which students live. Connections are sought between students' lives and the content of the unit. Therefore, the authentic application of skills can best be measured by determining the extent to which they have value and meaning beyond the instructional context. The purpose of authentic reading activities is to engage students in reflective inquiry, critical thinking, problem solving, or decision making.

To use knowledge in authentic ways, students must be able to apply a number of complex reading skills, such as understanding causal relationships, linking reasons and results with solutions, comparing conflicting points of view, drawing a lesson from the conflict and applying it to a contemporary event. The purpose of the reading guides in this section is to provide opportunities for students to apply their existing knowledge to questions about new content, to learn new content with understanding, to synthesize and communicate what they have learned, and to generate new knowledge or creative applications.

Reinforcing Powerful Learning

Powerful ideas are drawn from concepts, themes, and generalizations that come from the disciplines that make up the social studies-history, geography, government, and economics. Examples of powerful social studies concepts are change, culture, diversity, justice, and conflict. These concepts can be combined to form themes that are linked to the various disciplines within social studies. Examples of geographic themes are relationships within places and human interaction with the environment. Generalizations drawn from these themes and concepts are the heart of social studies. An example of a generalization is that human adaptations produce both intended and unintended consequences.

An excellent resource for identifying powerful concepts, themes, and generalizations are the various reports published by academic societies, professional organizations, and educational agencies. Some of the more useful are the Joint Committee on Geographic Education (1984), Bradley Commission on History in Schools (1988), Joint Council on Economic Education (1984), Center for Civic Education (1990), and the Center for the Teaching of History (1994). They have published lists of themes for each of the disciplines. By their nature, powerful ideas and powerful content are integrative and help students form and develop deeper and richer understandings. This is critical for improving comprehension of informational materials such as social studies textbooks. Powerful ideas build knowledge that is the basis of making connections.

MATHEMATICS

Constructing meaning is the core of a mathematics curriculum. As students begin to construct meaning in mathematics, they use processes which are not unlike those used in writing where meaning construction lies at the center of the process. In mathematics, identifying the problem and thinking about how to solve the problem occur simultaneously. Whether in writing or mathematics, processes interact to help the writer or mathematician solve problems, that is, to construct a composition or a mathematical solution.

As mathematics teachers know, reading mathematics is vastly different from reading other subjects. When reading a mathematics book, the student is actually reading several kinds of language:

1. the language that appears in a mathematics lesson and rarely elsewhere, such as the vocabulary words "rhombus" and "equation";
2. words that have multiple meanings with very specific meanings in mathematics, such as "prime" and "set"; and
3. the language of symbols and numbers.There are strong links between reading skills, knowledge of mathematics vocabulary, and problem-solving ability.

These are reflected in the specific skills needed to read mathematics, which fall into the following five categories (Ciani, 1981; Pachtman & Riley, 1978):

1. The ability to recognize and pronounce symbols.
2. The ability to attach literal meaning to mathematics concepts.
3. The ability to interpret literal meanings in terms of mathematical symbols (i.e., understand supporting details, interpret graphs and charts, interpret equations and formulas).
4. The ability to apply interpretations and solve the word problems using such skills as analyzing the information and moving back and forth between general language, mathematical terms, and numerical symbols.

5. The ability to use specialized study skills, such as rate adjustment, locational skills, following directions, and test taking.

The range of reading ability in a mathematics classroom can span a ten-year period, ranging from a reading level of grade 3 to a reading level commensurate with that of a second-year college student. Yet, in many classrooms, all students must use the same mathematics text regardless of the discrepancy between their reading abilities and the difficulty of the text. This discrepancy can be bridged, however, through teacher guidance and effective instruction. Through skillful application of these two variables, all students can learn to comprehend the mathematics text.

Because effective instruction is so crucial to students' abilities to comprehend from texts, let's look at some instructional strategies that may be used to teach mathematics lessons.

Directed Reading Activity/DRA

Perhaps one of the most powerful strategies to teach a lesson may be found in the use of the directed reading activity (DRA). The DRA systematizes the way in which students approach a text. The teacher takes an active role as she or he leads students through the text and teaches them how to read and use the information in the text. The steps in the DRA include:

1. **Readiness:** Involves motivation and exploration of students' prior knowledge relative to the task. The new assignment should be discussed with regard to past work in order to develop a frame of reference for students.
2. **Vocabulary development:** It is crucial that vocabulary be taught prior to reading the text.
3. **Instruction in reading skill or skills needed to comprehend the assignment:** Some possibilities may be cause and effect, finding the main idea, summarizing, sequencing, interpreting graphic aids.
4. **Springboard questions:** Set the purpose for reading by asking questions that will direct students' thinking prior to reading.

5. **Reading the assignment:** Students silently read the assignment, keeping in mind the springboard questions. Specify follow-up assignment, if required.
6. **Review and follow-up activities:** Review may begin with answering the springboard questions. Further questioning evolves; students are asked to prove their answers by reading aloud from the text those sections that support their responses. Skills may be reviewed. Further reading or projects related to the text material may be undertaken.

DRA in the Mathematics Classroom

Now that we have reviewed the major parts of a DRA, let us see how the teacher of mathematics can adapt this activity for use in her or his classroom.

Readiness

This component makes use of students' prior knowledge. The teacher should identify the skill, concept, or principle that is to be presented in the lesson to the class and tie the new lesson to what has been previously learned. Sometimes a preassessment activity can be completed to determine students' preparation to learn the new material and their general comprehension of the text material.

Vocabulary Development

Instruction in mathematics vocabulary must be an intrinsic part of a mathematics lesson so that it will more likely be applied in problem solving. Mathematics has a technical vocabulary unique to the discipline, but it also has vocabulary that, while used in a special way in math, also has a general meaning. To help students learn the vocabulary of mathematics, the use of structural analysis can be very effective.

By using structural analysis (prefixes, roots, and suffixes), students can dissect a word to see if there are any recognizable parts that will give clues to its meaning.

The teacher may prepare a worksheet, which students may keep in their notebooks and which may be added to throughout the semester as new morphemes, smallest meaningful units, are

introduced to students. Words having specific math meanings and also general meanings may be taught using the instructional design. The teacher may list the word and teach the mathematical meaning for the word through contextual clues, through examples, or through the dictionary. Students should generate their own general meanings for the words and write them under the column entitled "General Meaning." After students have completed their general meanings for words, a few minutes could be spent sharing their meanings with their classmates.

To comprehend math and be able to compute accurately, it is essential that students be able to identify math symbols on sight. After teaching the symbols needed, it might be useful to have students match the symbols to their meanings

Setting the Purpose and Objective of the Lesson

The teacher may start with a particular example of a skill or principle, rather than a general or symbolic representation. For example:

Goal: To learn that solving a linear equation in one variable with integer coefficients can be summarized in the following manner:

The solution to a linear equation of the form

$a \cdot x + b = c$ is $x = c - b / a$

This general representation is too difficult for beginning students. Instead, it is beneficial to start with a particular example so that students can more readily understand and apply the skill.

The teacher should discuss the steps with the class as you move from the simple to the general and explain each step as it is completed.

Example: $6x + 8 = 4$

Question: What can we do to both sides of the equation?

Response: We can add a −8 to both sides of the equation.

Question: What will adding a −8 to both sides of the equation do?

Using students' prior knowledge, the teacher should elicit from them the fact that when a −8 is added to each side of the

equation, the equation is still balanced and adding a −8 to the left side of the equation negates the +8, leaving the left side of the equation reading 6x.

Question: What will happen when we add a −8 to the right side of the equation?

Response: Adding a −8 to the right side of the equation adds a negative number to a positive number, in which case the numbers are subtracted and the answer to the problem takes on the sign of the larger number.

The above response would also depend on students having the prerequisite skills, which would no doubt have been taught during previous lessons.

The equation would now look like this:

$6x = -4$

Question: If we want to solve for the variable x, what can be done?

Response: Both sides of the equation may be divided by the number 6.

Question: If we divide 6x by 6, 6x/6, what happens to 6?

Response: 6 divided by 6 is equal to 1, so the left side of the equation reads simply 1x or x.

Question: If we divide −4 by 6, −4/6, what happens?

Response: The answer is −4/6, and the right side of the equation will read −4/6.

Question: What is the solution to the example?

Response: $x = -4/6$

Question: Suppose we wanted to prove our answer. How could it be done?

Response: The equation can be solved, substituting the answer −4/6 for the variable x.

Question: The equation is $6x + 8 = 4$. Let's substitute −4/6 for x and prove our answer. How would the equation look with the substitution?

Response: $6(-4/6) + 8 = 4$ or another way $6/1 \times -4/6 + 8 = 4$

Cross multiply: $-4/1 = -4$; 6 cancels out: $-4 + 8 = 4$

Add +8 and −4, subtract 4 from 8, and the answer takes the sign of the larger integer. Again, students call on prior knowledge.

Ample practice must be given in order for the students to internalize the learning. Moving too quickly from one example to another without allowing the necessary time for students to see the application of the skill in various situations can be detrimental to learning.

Reading and Practice

During the reading of an assignment, students must have a systematic way in which to approach the reading of mathematics problems, a system that is general enough to fit almost all the kinds of problems to which students would be exposed. Such a technique is SQ3R. The purpose of the SQ3R method (survey, question, read, recite, review) is to systematically lead students through a textbook assignment by using reading techniques that will help them reach the goal of comprehending the text (Robinson, 1946). For the mathematics teacher, two adaptations of SQ3R can be useful. The first variation is the **SQRQCQ technique by Fay (1965).** This technique is as follows:

Survey: Read the problem quickly to determine the purpose.
Question: What is the problem?
Read: Look for details and interrelationships.
Question: What processes should be used in the problem?
Compute: Do the computation.
Question: Does the answer make sense? Check it against the facts in the problem.

Singer and Donlan (1980) suggest another alternative to SQ3R. Their technique is called RQ4S2T.

R Read the problem carefully.
Q1 Question: What facts are given?
Q2 Question: What do I have to find out?
Q3 Question: What shall I let x equal?
Q4 Question: How shall I represent other information given in the problem?

S1 Set up equations by translating words of problems using answers to Q1, 2, 3, and 4 for left and right members of the equation.
S2 Solve the equation.
T Test answers of solutions in the equation by substituting the answer in the equation.

These techniques can be useful in helping students comprehend mathematics text. Students need strategies because they must generate the information needed in solving the problems.

Should you not wish to use specific formulas to help your students learn from their texts, you might consider teaching them the following simple process.

The students ask themselves: What am I looking for? What am I trying to find out? They read the problem twice.

What facts do I need to solve the problem? Is the information in the problem? If the information is not in the problem, where can I find it?

What should I do? Guess and check? Draw a picture? Make graphs? Charts? Try to solve the problem using simpler numbers? Can I solve it in my head? Can I find a pattern?

What tools should I use to solve the problem?

Using my selected tools, have I found the correct answer? Is the answer I have found sensible? Does it fit the facts of the problem? Does my answer match my estimate?

Teachers can aid students by establishing a pattern with them that will facilitate their ability to comprehend the text and also their problem-solving behavior. Prior to solving the problem, the teacher may ask questions to ascertain whether they understand the problem and then discuss possible solutions and strategies. While students are working, the teacher may observe them and give them hints as needed. The teacher should require that the students check back and reread the problem, substituting their answers in the problem. If the teacher uses a consistent method of solving problems, students will internalize the process and be better able to solve problems on their own.

Reading and Practice Prior to Computation

Another method of attack to reading word problems that may be utilized at the beginning of the lesson involves the following steps:

1. Students must read the assignment once at a moderate speed to get the general idea of the word problem.
2. Major ideas of the problem are discussed. (The teacher should discourage too much detail.)
3. A student reads aloud the different parts of the problem.
4. During the above recitation, the teacher interrupts at crucial points, for example, when the student should draw a figure, do some calculating, or seek some additional information.
5. During the reading aloud of the problem, all students and the teacher may interrupt and ask the reader or each other any questions.
6. All books are closed after the first five steps.
7. Students then take a quiz on the content of the word problem.
8. The teacher reveals the answers immediately.

This strategy can be effective because it models for students the kinds of questions they should apply to the text in an effort to comprehend effectively; it also helps them find the core of the verbal statement by focusing on the selection of the main idea and how it relates to the rest of the problem.Another technique to convert elements of a word problem into a workable equation is the "If/Then" flow chart (Clarke, 1991). With this strategy, it is important that the students first determine the purpose of the problem.Steps in an If/Then Flow Chart

1. Read the problem first.
2. Determine what kind of a problem it is. Is it a distance problem? Is it a interest problem?
3. If it is an interest problem, find a formula to solve it.
4. Using the formula, create an equation.
5. Then, solve the equation.
6. Then, check the answer.

SCHEMA THEORY

Many psychologists use the term schema as the basic building block of cognition (Rumel Hart, 1980; Mandler, 1984). According to this view all mental organization of human beings is schematic in nature. Our knowledge about an object or classes of objects, about events, social norms and even language can be considered to be small networks of information that get activated with our experiences and that function according to certain schematic principles. However, the exact nature of organization of knowledge in each of the different domains is still a matter of research. Eminent scientist like Klahr, ***Chase and Lovelace*** (1983) have shown that representations of alphabets is serially organized in the human mind, with restrictions on points of access and on the rate at which we can produce various portions of it. The schematic organization in case of language has been pointed out as a spatio-temporal one.

Schema is organized knowledge structure that helps the reader in comprehending a text; they are the building blocks of cognition (***Rumel Hart & Ortony,*** 1977). The term schema was first used by ***Sir Frederick Bartlett*** in 1932. Schema is a concept which includes all the associations, experiences and relationships that have been connected to the concepts. Schema refers to—

(i) The reader's cognitive base—conceptual systems, understandings and vocabulary.

(ii) Semantic information or the semantic context that reflects the experience and background information, a reader brings to the text. The reader utilizes a semantic queue and uses the semantic context when he associates his previous experience with a graphic symbol.

(iii) The reader's linguistic experience or the reader's knowledge of language and the grapho-phonemic and syntactic systems. Syntactic information is the knowledge of the grammatical relationships within a sentence. It is the reader's basic understanding of graphemes, recognition of the alphabet and the concept of direction, along with his understanding of importance of word order, sense of story and structure, understanding of the

relation between spoken and written language, realization of the format and style, coherence of text and rules of inference.

(iv) The reader's knowledge of rhetorical structures that signify the organization of text. Readers can understand a text better when they realize the patterns and story grammar used in the text (***McNeil,*** 1987).

(v) The reader's purpose and expectancy (***Dupuis et al.*** 1989).

Schema tends to have three major characteristics—

(a) They are composed of variables whose content is determined by the person's past experience.

(b) They are usually embedded within a larger schema and will have smaller schemata (plural of schema) embedded in them (***Rayner & Pollatsek,*** 1989).

(c) They vary in their degrees of abstraction.

The schema often assumes a categorical structure and on the basis of similarity and inclusion in a certain category, a relation is established between the members of that category, on the basis of which they are all grouped together. Scholars like ***Nissen*** (1979) have pointed out a serial structure of schematic organization—an organization in which each item is connected to the next in a unidirectional series. The organization of alphabets was given as an example. The unidirectional nature of this organization was proved by the fact that one can rapidly produce the alphabet 'K' if asked to retrieve a letter next to 'J', but usually takes longer to produce 'I' if asked to retrieve the letter preceding 'J'. The alphabets form a string, segmented into chunks and this chunking continues in different other linguistic acquisitions. ***Jones*** (1974) and ***Restle*** (1970) show that with repeated exposure, there is a human tendency to impose segmentation on a linguistic string to from subunits of a larger whole. A musical piece or a song is an example of such segmentation. Segmentation of a song or a long poem or a script, with multiple entry points, is an example of **temporal schema.**

The **Schema Model of Reading** had been popularized by ***Smith & Dechant*** (1961) who noted that printed words transmit meaning only when interpretation and comprehension

of the printed matter is achieved by the reader's mind. The reader comprehends the text in terms of his previous experience and the critical element in the process of reading emerges through the invoking of meanings of the graphic symbols on the printed page. This previous experiences and interpretations are related to the symbols printed on the page. Reading, thus, is a cognitive process and cognition in itself 'is a sensation clothed with the perceiver's wealth of past experiences. Reading requires the reader to go beyond the sensory data, the graphic symbols on the page and to ascertain meaning' ***(Emerald Dechant)***. The incoming sensory data, the words, must be processed and reorganized by the reader, i.e., the information from the retinal system must be interpreted by the brain. It must be converted into a cognition or a representation with the help of past experiences. Perception and cognition are thus co-determiners of reading. What the reader perceives is his mental image of what he reads.

Schema Theory emphasizes cognition, conceptual learning, information processing, conscious experience, organizing, storing, retrieving of information, reasoning and problem solving. The German word ***'Erlebnis'***, signifying the private world of personal meanings and the phenomenal world of the individual has often been used by scholars to explain the organization of schema in terms of reading.

The major focus of Schema Theory is the cognitive structure, also known as 'the spiral of knowledge' (***Poplin,*** 1988) and 'scripted knowledge' (***Yekovich & Walker,*** 1988). Cognitive structure or schema consists of concepts which have been organized hierarchically in a way categories are arranged in ***Bruner's*** coding system (1966). Readers develop meaning through new experiences assimilated with recalled experiences. Poplin points out that recalled experiences are frequently united and transformed into new meanings as parallels are drawn, commonalities are found, thoughts are rearranged, questions are rephrased or new solutions are discovered. The process goes on spirally. A sentence is much more than its constituent phrases and words, just like water is much more than hydrogen and oxygen. Each new act of reading or comprehension **(in any**

subject) leads to a new spiral of knowledge and to a new pattern or gestalt. ***Rumel Hart*** (1984) suggested that all knowledge is packed into units or schema that the readers comprehend when they find a configuration of schema offering a coherent account of the text. He argued that a reader constantly evaluates hypotheses about the most plausible interpretations of the text. As the reader reads the sentences, he activates, evaluates, refines and discards multiple schemata. "If they (readers) find the new information confirmatory, they maintain and further elaborate their hypotheses and construct meaning consistent with the input data" (***Rumel Hart,*** 1984).

According to the schema theory all knowledges organized hierarchically and stored in the brain in the form of mental frameworks, concepts or cognitive structures (***Durkin,*** 1984). Schema theory postulates an architecture of knowledge representation and elaborate frameworks of interconnected ideas with slots, nodes or 'placeholders' that record the particulars of an event or new experience (***Kardash, Royer & Greene,*** 1985). It has been argued that the schema has an invariant part in the core and the slots are the variable characteristics. This means that a schema contains a specific type of information and permit the assimilation of additional information. Through filling up of the empty slots. ***Just & Carpenter*** (1987) showed that schema slots helped to identify the referent of a word or the interrelationships between the different parts of the text. E.g., in the sentence—'I went into the kitchen to get the glasses', the inference is that the speaker got drinking glasses and not eye glasses. Human language uses such shortcuts, employed meaningfully with the help of schema. ***Hittelman*** (1988) thus observed that schemata are—

(a) Templates in the memory against which incoming information is matched.
(b) Organizers that specify how all previously learned information will interact with and shape new information.
(c) Processors that specify how the incoming information must be arranged.

Yekovich & Walker (1987) revealed that with every new information or experience some slots are activated and these

activated slots are inserted into the memory trace. Reading is a process of perpetual encoding and the word 'brush' directly activates BRUSH in memory, thereby raising its activation level. Since the word 'brush' has more than one meaning like painting brush, hair brush, toothbrush etc., usually only one meaning is selected for getting inserted into working memory while the others are deactivated almost simultaneously. This means that one set of slots is activated along with deactivation of other slots.

Assimilation, Accommodation and Good/Bad Readers

Schema theory stands on the principle that the most important factor influencing learning is what a learner already knows. Good readers comprehend the text faster and more effectively because they activate their previous knowledge and fit the new information to their existing schemata much like new wine in old bottles. According to ***Marr & Gormley*** (1982), good readers show that information is comprehended, retained and recalled best when related to similar ideas or information within the memory. The **previous knowledge** acts as an **'ideational anchorage'** to which successive chunks of information may be attached.

McNeil (1987) describes the fitting of new into the old as assimilation. In this process of **assimilation** each new experience is related to and becomes a part of the previous experience, which, in turn, becomes the basis for new interpretations and meanings. ***Gillett & Temple*** (1986) observes that—

(a) The information in our own schemata colour greatly the experience we have, and so a person with more elaborate schemata will get more out of the experience than a person with less elaborative schemata.
(b) By interpreting a new experience in the light of our existing schemata, we ever show slightly modify and enrich those schemata.

Accommodation is the changing of existing cognitive structures to create space for the new inputs. Accommodation requires an extension or revision of the existing schemata. According to ***Eggen & Kauchak*** (1988), when a reader encounters new information, he may—

(a) Incorporate new facts into the existing schema. This is a process of assimilation and results in attrition of new knowledge. The material to be comprehended and remembered is attached to old structures without changing the structures.

(b) Modify the existing schema to accommodate new information, which results in the fine tuning of the cognitive structure

(c) Restructure the schemata. In this situation the reader cannot make sense of what he is reading with his existing schemata and so the reader must restructure his cognitive structure by creating entirely new schemata. This is how new perspectives and meanings are generated through the process of reading. Good readers integrate their vast previous reading experience with what the text presents. In contrast poor readers frequently interpret the texts only to fit it to their limited schema and almost never try to restructure and create new schemata (***Marie & MacGinitie,*** 1982).

Since schema depends upon the reading and life experiences of an individual, it is unlikely that any two persons will have exactly the same schema and interpret a text exactly in the same way. Reading and life experiences of two individuals are always different and so their corresponding schemata are different as well. Their reading comprehension is naturally different. This applies to writers too. Previous experience, both in terms of reading and real life, for each individual being different, no two writers can write about even a common experience/event in exactly the same manner. However, there must be some common element in the perception and schema of the writer and the reader that enables a reader to comprehend a text produced by the writer.

It is thus believed that reading comprehension is an interactive process, in which both the text and the knowledge of the reader play significant roles. Vacca&Vacca (1986) thus note, 'there must be a point of contact between the reader's knowledge of the world and the ideas communicated by the textbook author. Reader and text must interact for comprehension and learning

to take place' (p.103). Comprehension of text is aided by existing schema, but the process of reading also fills up some of the empty slots within the reader's schema as discussed earlier. Comprehension is thus a process that not only depends on existing schema, but also develops new schemata. A reader constructs meaning with the help of the writer's words and their own experiences.

The distinction between good and bad readers apparently depends on the nature of schema the reader has and the reader's capacity to remember meanings and to make adequate use of context clues. A reader's comprehension is said to be at risk when—

(a) They do not have appropriate schemata (***Rumel Hart,*** 1984)

(b) They cannot or do not use their prior knowledge (***Holmes,*** 1983)

(c) There is a mismatch between the reader's previous experiences and current experiences (***Poplin,*** 1988)

(d) The writer has not provided appropriate clues to activate the reader's schema (***Baker & Brown,*** 1984)

(e) The text is too complex or stylized

(f) The text does not have a story structure and quality (***Elkind,*** 1974; ***Guthrie,*** 1977)

(g) The topic, concepts presented, syntax, organization, format, semantic requirements may be poor and there is an absence of cues sufficient to activate the reader's schemata.

(h) The reader's interpretation of the text may not match with the interpretation intended by the author. This may happen due to the reader's unawareness of a shift in schema during reading (***Vacca & Vacca,*** 1986).

(i) Inadequacy of local processing, i.e. poor working memory capacity of the readers.

(j) Poor quality of semantic encoding, i.e. poor vocabulary and the capacity to infer meanings of unfamiliar words from context (***Perfetti,*** 1985).

This is to say that if a text contains many unfamiliar words and a reader cannot make use of the context clues (from the other lines in the text) to infer the unknown meaning, the reading comprehension will suffer.

(k) Distorted, vague or incomplete schema affects comprehension negatively. ***Malicky & Brake*** (1983) found that second graders, hen reading silently, sometimes rely too much on background knowledge and produce information beyond the constraints of the text. Thus they were comprehending but the interpretation was going the wrong way.

There is an apparent contradiction in the schema theory when it comes to reading comprehension. Some researchers assert that information that does not fit the reader's schema is not remembered well and may even be lost. On the other hand some schema theorists believe that information is better remembered if it is different from the reader's existing schema because the reader's mind tends to reject typical or similar information as redundant or irrelevant. The memory rather choses to assimilate different information and thus one remembers it for a longer time.

DIFFERENT TEXTS

Language is emergent, multiform, negotiated in the process, meaningful in the uptake, accomplishing social acts. Analysis of writing must go beyond considering the written text as an inert object, complete in itself as a bearer of abstract meanings.

Expository Text

Precise and information or fact -providing in nature. As opposed to narrative texts it doesnot provide a chronological account laden with emotions or fiction but presents specific facts with clarity and precision. Expository texts purvey a tone of authority, since the authors possess authentic and accurate information on the subjects they write about (***Fisher & Frey,*** 2008). Expository text uses clear, focused language and moves fromfacts that are general to specific and abstract to concrete.They utilize specific structures to present and explain information (***Burke,***

2000).The five most common structures utilized in informational text are cause-effect, comparison-contrast, definition-example, problem-solution, and proposition support or sequential listing. Expository text often gives an indication of the facts that would be unfolded as the text progresses. Some features that distinguish informational text from literary text are organization and the way information is presented (National Assessment of Educational Progress, 2005). Benefits of reading Expository texts are that they help the readers to—

- Comprehend a variety of written materials
- Build and extend background knowledge about a variety of topics
- Develop vocabulary
- Learn how different texts are organized and written
- Improve the recall of key text information
- Discover what is likely to be most relevant for understanding the story (Teacher Reading Academies, 2001)

Narrative Text

"Narrative"is a word of ancient origin and recent popularity. It derives from the Latin word, gnarus, which means "knowing." a telling history. It now is used to refer to a variety of language games: some with factual, some with fictional reference, some decontextualized activities, some that occur in the context of playing with toys. Most are oral exchanges but some are written performances. In fact, some chapters in this volume are directed to sorting out and systematically relating these many genres of narratives.may be defined narrowly despite these genre differences. ***Labov*** (1972) defined a minimal narrative as two temporally ordered clauses in the past tense, and narrative in general as "one method of recapitulating past experience by matching a verbal sequence of clauses to the sequence of events which (it is inferred) actually occurred" (pp. 359-360). Stories, novels, poetry with chronological description of events etc are examples of narrative texts.

Ursula Le Guin (1989) pointed out: "Narrative does not normally use the present tense except for special effect or out of

affectation. It locates itself in the past (whether the real or an imagined, fictional past) in order to allow itself forward movement. . . . The present tense, which some writers of narrative fiction currently employ because it is supposed to make the telling 'more actual,' actually distances the story. . . . The present tense takes the story out of time" (p. 38).Through narrative we find ourselves in the process of presenting ourselves and our experiences. "We are the stories we tell" (***Martin,*** January 8, 1989).

Of the vital importance of narratives, ***Dell Hymes*** (1982) wrote:

In the serious and scheduled occasions when [American Indian] children were the specific audience for the telling of myths or when children were simply present when myths or other narratives were being told, not only were samples of language being presented, but over and over again, at every level, an implicit organization of experience into set, satisfying patterns was being conveyed and internalized. . . . Again and again, instead of a chaos of events, experience was organized into sometimes subtle patterns. . . . [A particular story] takes only a few minutes to tell or read, but its apparent bareness, if skimmed as prose, belies an underlying process of arousal and satisfying of formal expectations of some complexity. (pp. 121-122)

Generic Structures of Narrative Text

(1) **Orientation:** Sets the scene—here and when the story happened and introduces the participants of the story: who and what is involved in the story.

(2) **Complication:** Tells the beginning of the problems which leads to the crisis (climax) of the main participants.

(3) **Resolution:** The problem (the crisis) is resolved, either in a happy ending or in a sad (tragic) ending.

(4) **Re-orientation/Coda:** This is a closing remark to the story and it is optional. It consists of a moral lesson, advice or teaching from the writer.

Transactional Text

Transactional text is associated with the purpose of communicating ideas and information between individuals. Transactional writing includes a broad range of text types, such as business letters, friendly emails, invitations, speeches, and interviews. Students need to learn both social and business writing formats to be successful in school, the workplace, and social settings.Transactional writing texts are either a response or an initiation of a response. As implied, these are 'transaction texts'—a friendly letter of appreciation will possible yield a response, as much as a speech will get the audience won over or yelling in disagreement. Letters, memo, notices etc are examples of transactional text.

Reflexive Text

Reflexive Communication or Reflexive Text assumes that different individuals have different views of the same reality and, therefore, derive different meanings from the same situation. Mutual understanding of any single situation can only result from construction of a convergent view of that situation. Therefore, the actual process of communication—conversation itself—becomes important. Conversation using the process of reflexive communication helps individuals realize the multiple views and meanings that they have of any single situation. Reflexive communication is an active process that is particularly useful in understanding persons who come from different cultural contexts. Among individuals in an increasingly diverse society, there may be more than one understanding, more than one meaning of a single reality. Individuals who come from different cultural paradigms or different hierarchical positions may perceive the same situation differently and draw different meanings from it. Reflexive Text is a general theory that lends itself to any communication context. Therefore, in any setting or on any topic, the process of reflexive communication will evoke multiple points of view and generate mutual self-awareness for the participants.

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PRACTICUM

TASKS /GAME

In observing children on the playground or in the neighborhood, one notes that they invent games of many descriptions, some for one person, others for groups varying in number, age, and ability. The games differ in complexity according to the ability of the creator, but generally rules are minimal, limited to those needed at that particular moment. Rules are often modified as the game progresses to offer the most favourable opportunity for success by everyone, with special rules applied occasionally on an individual basis as differences in ability are considered by the group.

Children play games without adult supervision, choose teams that provide equal competition (although we might not consider their methods to be in the best interests of all the players), abide by the rules set by the group, and work out most differences of opinion in a reasonable manner. Scoring may be given little importance, and when the game ends, no real winners are declared. Children's personal satisfaction comes from being physically active and having given their best efforts in the play just completed.

When used effectively, games can make a substantial contribution to the objectives of education and consequently to the development linguistic skills. Games provide an opportunity for students to

(1) use a variety of skills and their adaptations;
(2) analyze a situation and use creative thinking in developing strategy;
(3) share ideas and to work together in leadership and follower roles to meet challenges in achieving the game objectives;

(4) learn about themselves—their strengths and weaknesses—as they attempt to find appropriate solutions to game challenges based on their individual linguistic skill repertoire;
(5) take risks in a fun way as they move into areas of uncertainty and insecurity without the real threat of failure, since the outcome of the game is not a life and death matter; and
(6) experience self-discipline in playing within the parameters of rules and boundaries, including assuming responsibility for the enforcement of rules by acting as the leader or official.

To be meaningful for students, the cognitive and social aspects of the game must match the developmental needs of the participants. To achieve this, it may be necessary to alter the size of the playing space, the skills used, and the equipment available to adjust for the needs of the group; to change the number of players and player relationships to meet the social development needs of the children; and to modify rules to further meet the cognitive needs of the students who will play the game. Games should challenge children within their capability for play and prepare them for game play independent of adult supervision. Ideally, the majority of games incorporated into a lesson should be used as a means. These games are selected not because children like them, the teacher knows them, or facilities and equipment are available, but for their possibilities in furthering learning in physical education and adding to the lesson's objectives. A game may offer a series of possibilities for learning, so it might be used on a number of occasions, with different elements stressed each time the game is played.

Integrating the Four Linguistic Skills

The four language skills are rarely isolated from one another in authentic settings. For example, we might read a film review and discuss it with a friend, or check a train timetable and make a note in our diary. Reading leads to, and is often, at some point in the reading cycle, integrated with, discussion, note-taking, listening or action of some kind. Similarly, listening might lead to making a note in a diary, marking a place on a map, or choosing an item from a list. This process of transferring

information so it changes into another form is called information transfer. This cycle can be achieved in the classroom by replicating these real-world connections between skills. The learner starts with a stimulus such as a set of instructions or a map, and changes the information, presenting it in another form or doing something with it that reveals understanding of its message. The following table offers a number of information transfer examples. Column A suggests the starting point-a visual, written or spoken stimulus. Column B suggests the real-world changes we might make with this information, and in so doing, we transfer the information from one medium (written or spoken) into another. Each of these real-world changes could also be translated into teaching activities.For example:

[i] The teacher may play a voicemail message to his learners in which the speaker confirms a tour plan. Learners check the arrangement and record it in their diary. The learners share photographs of their friends and families or atleast share names and relations of their family members. They work in pairs to fit the details of the plan with their family, adding necessary details. They may then report the final plan.

[ii] The teacher may use many props as shown in Column A

Column A[aids]	Column B[tasks]
• An itinerary of a journey • Written or spoken instructions for making origami • Factsheet on global warming • News story on the radio or in the paper • Recipe Advertisement • Job description	• Give a partner verbal instructions • Compare with partner's factsheet and make a note of new information Summarise story to a partner • Make a shopping list of ingredients • Role-play buying/selling the item • Make enquiries about the job • Plan interview questions for the person

Column A[aids]	Column B[tasks]
• Biography of a famous person • A song where we know only some of the words Film reviews • Episodes in a story (oral or written) • Letter to an agony aunt column • A horoscope	• Guess the missing words, listen for them and note them down • Discuss films with a partner & write report • Organise the episodes into a sequence • Reply to the letter offering advice • Tell your partner's future Write captions • Compare; summarise; correct; reorganize; dictate; note; match; combine; fill in gaps; list; guess; share information; write captions; label; mark; record order; organise

SOME GAMES FOR DEVELOPING LISTENING COMPREHENSION, READING, WRITING AND SPEAKING IN ALL CURRICULAR SUBJECTS ACROSS THE CURRICULUM

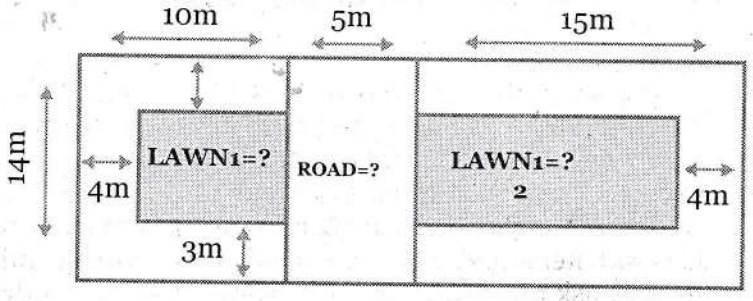
1. A list is dictated to the students and they take it down. Now price is dictated and they put the price per kg/per gm /per dozen against appropriate names written earlier. Now they are divided into small groups and one group member from each group plays the role of a shop keeper while each of the other members come up with customized lists with items and basic price fixed, but varying quantities. As they ask for the differing quantities they have to frame questions and calculate the exact price they have to pay. The shop keeper too needs to communicate and calculate. They should haggle as well. A basic list dictated may look like this—

Potatoes—Rs. 17 per kg Tomatoes—Rs. 40 per kg
Cauliflower—Rs. 20 per piece Apples—Rs. 120 per kg

Chicken—Rs. 100 per kg Onions—Rs. 80 per kg
Bananas—Rs. 20 for half a dozen Rice—Rs. 35 per kg

Now each group member will place orders for different amounts and the group that makes the most realistic conversation including haggling for cheaper rates and the most accurate calculations in the shortest time will win. The students must be instructed to place realistic order for real life households in order to win. For instance they should not ask for 10 kg onions or 30 kg flour.

2. The same list may be used to urge the students to frame as many mathematical questions as they can with the basic information. This would teach to think critically, write correct sentences and frame questions. Various other basic information regarding time and distance, ratio and proportion, profit and loss etc may be provided in numbers and the students would frame question with the help of the basic data. The teacher must help with the clarity and precision as well as the accuracy of the language of the questions.
3. Various pictures may be used to urge the students to look at and write statements and questions on the basis of what they see. For instance, the following picture may be shown to one group of students while a similar picture with different dimensions [length breadth etc.] may be shown to another group:



The students should study the picture and frame a complete problem statement with a question. They may engage in pair work in doing so. Each group will hand over their questions to the other group and after solving the sum they may swap scripts again so that they get to check the other group's work. Many other pictures may be

used like this. This helps the students in critical thinking, reading and writing skills. If they discuss in pairs then speaking and listening skills are involved as well.

4. Students may be engaged in pair work and provided with various geometrical shapes. Then they are urged to give a set of instructions in any language they are comfortable in, which their partners would listen to and then put the shapes as per the instructions to create a picture. For example, the first student may say something like "Put the triangle over the square and a rectangle in the square. Now draw a circle over the whole shape and add a straight line as the horizon. The partner must not draw anything as long as his peer is speaking and will start only after the whole instruction has been given. This task helps to improve listening comprehension, visualization and speaking skill. Advanced classes may add dimensions to the shape and frame questions that the partner must write down. They can then find areas collaboratively.
5. The Geography and Physical Science teacher may work collaboratively with the former teaching the formation and activities of a volcano and the latter teaching the pupils how to make a cardboard/playdough hill with baking soda and acetic acid or vinegar inside to cause a little explosion. The students must then write the steps one after another in form of a chart and prepare a poster explaining why volcanoes errupt. They may arrange an exhibition for lower class students where they demonstrate the eruption and explain how they made that fun volcano. The partner may read out the poster and the chart to explain the geological reason behind the eruption. All the skills of writing, speaking, listening and reading are involved and younger students get motivated.
6. Similar tasks may be carried out for explaining transportation of water through xylem tissue of plant's stem in the Life Science class. White flowers are kept in a bottle of water mixed with red /blue colour and after some time the white flower turns red/blue. The teacher explains and the students listen carefully. They then carry out the experiment themselves. Students would work in pairs and prepare posters with steps written clearly. They would

organize an exhibition for junior students and explain the phenomenon. This type of task involving speaking and writing tasks may be carried out in any subject and the best demonstration may be declared the winner.

7. Giving directions in any form is an effective exercise. The students may keep giving instruction to their peers as they draw a fish complete with fins, gills or scales or give more complex directions regarding a floor plan with dimensions that the peer would draw.
8. Preparing Ludo Boards with snakes and ladders is another such interesting game where the dice thrown would indicate numbers like a normal ludo game. But beside digits in the boxes on the board alphabets may be written and pupils have to frame a word and make a sentence with the alphabet they reach, alternatively each box may have names like static electricity/earthquake/prime number/auxiliary verbs/ Bengali "somash"/concept of democracy etc. depending on the subject being taught and the pupil has to speak a few lines meaningfully on the topic she/he reaches.
9. Various tasks and games for developing listening, speaking and writing have been discussed in Chapter 3 that may be used effectively.
10. Children may be urged to play the age old "Who am I game where they would give clues to their partners and even role paly and the partner has to guess the role he is playing.
11. Passing the ball, in various avatars may be played. The teacher may provide the starting line of a story and then start passing a ball aroundwith music being played. In this game the one holding the ball as the music stops will have to speak a few lines in continuation of what the previous speaker said. A coherent and comprehensive story / narrative may emerge from this.
12. The post man game may be played as well. A cardboard box would be placed in the class and students may write letters to their friends or even the teacher in the class in proper envelops. A student may play the post man delivering letters and answers may be circulated in the same way as well.

13. Silent movies or advertisements like the Ramesh/Suresh ad of 5 Star or Feviquick silent ad may be shown to a group of students with another group facing away from the visual. After the visual, the first group would face the second and narrate what they just saw. The task is repeated with a different visual and the first group now facing away from the visual.
14. Wonderful video games are available online that may be used for any subject if the institute has provisions.
15. Soundscapes discussed earlier in chapter 3 are effective means of developing speaking skills with creativity.
16. Students may paly anchors or newsreaders in class to develop reading and speaking skills
17. Campus journalism is effective as well. Students act as real reporters and editors and publish hand written weekly papers for the institute. They may be made to study real life weekly publications to decide what could be included. Film/book reviews may be included along with interviews, regular news and features. This enhances writing and critical thinking skills very effectively.
18. Two pictures of the same person, one in the childhood and one in mature middle age, are shown and the students are asked to speak on the probable changes in the life of that person from the pictures they see. This may be developed a little like a detective game where the students play the detective, trying to find visual clues from the pictures to talk about the socio-economic condition and other factors from the pictures.
19. Students may be urged to bring any family souvenir or object that belonged to their grandparents or any distant relative who is no more and then they can speak on the object and the person it belonged to. This "Show and Tell" task may be done in numerous ways and in almost the subjects. For example they may collect different types of leaves and talk on them and even write them down as a report.
20. Pictures with many people in different types of dresses peculiar to occupations may be shown /drawn by the teacher and the students divided into small groups would try to imagine and tell what those people in the picture

may be telling each other/speaking about. The most innovative or interesting account would be the winner.

21. A Bengali vernacular poetry class may be collaboratively used by many other subject teachers. For instance, a line like

"Poncho nodir tir-e beni pakaiya shir-e jagiya uthilo Sikh"

may be given to the students and used in various ways. The Geography teacher may ask students to locate the five rivers and speak about the geographical peculiarities and crops and industries on the region, while the history teacher may ask students to think of Sikh Gurus and kings and recount their tales of valor. There may be reading sessions where excerpts from the Granth Sahib or good History books like TheWonder that Was Indiaor Discovery of India may be read and reflected upon by the students. The English teacher may design various games and tasks based on these lines. For example the students may be given a turban and music may be palyed. As the music stops the one with the turban on his head will speak a few lines on any valiant warrior king or freedom fighter of our land in simple but correct language.

22. Certain texts may be deliberately and consciously chosen by the language teachers where there is a considerable amount of geographical details or names historical cities /monuments.

    Students may be asked to use green ink and blue ink. They would jot down the geographical details with green ink & the linguistic feature under discussion (for example 'Somas' in Bangla or 'Clause' in English) in blue ink. They may then rewrite the passage in their own language, adding relevant geographical or historical information they have recieved in those subject-classes.

23. Role play may be successfully done in History class with the students given full liberty of dialogue writing on the area taught. For examples they may write script and playact on an imagined conversation between Shah Jahan and Aurangzeb at the time of imprisonment.

TEXT ORGANIZERS

One very useful way of developing fluency in reading and listening is to organise information visually. Flow charts, Venn diagrams, cycles, onions, pyramids, mind maps and 'radial diagrams' all help us to visualise the relationships within a text, to explore ideas and to make sense of them. Some illustrations may clarify this—

[i] Concept Maps

An example from life science is given below. The students may be divided into groups and asked to write compact and comprehensive paragraphs on the definition, relation, functions of various movements, joints and tissues, after group discussion. The final report from each group may be read out or presented in the class. Such concept maps may be designed for any subject.

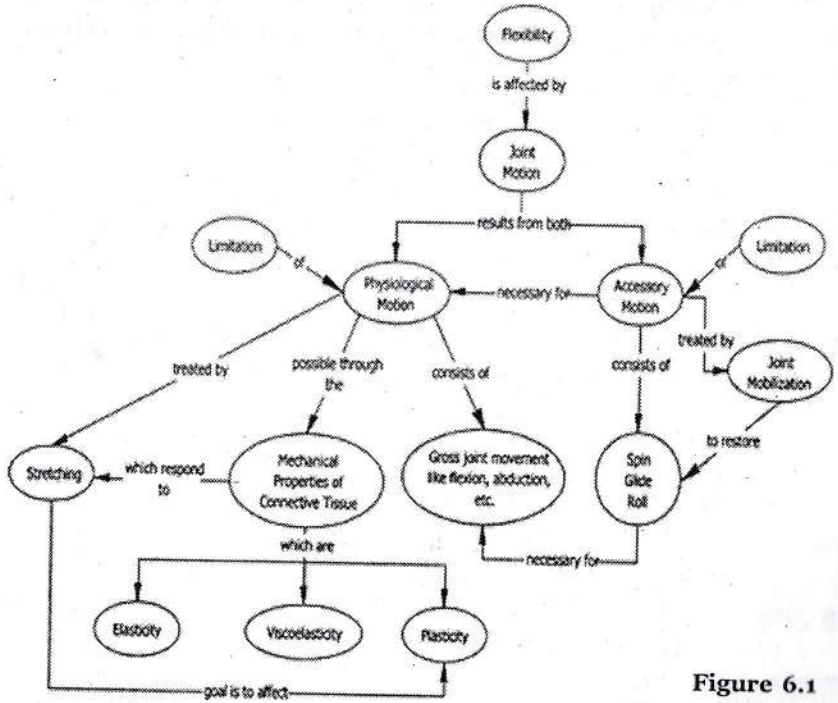


Figure 6.1

An example of a partial concept map for flexibility showing how concepts and propositions are related.

[ii] 'Spider Diagram'or 'Radial' Diagram

Copy the spider diagram below use it make a list of organ systems.

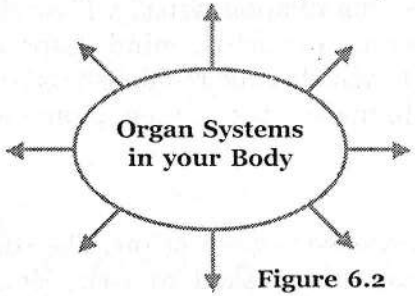


Figure 6.2

[iii] Venn diagram:

An example of use of Venn diagram in political science class is given below. Students may be provided with similar Venn diagrams n science, history or language classes and asked to write a paragraph describing the relations, similarities and/or dissimilarities they see. They may be urged to describe verbally as well.

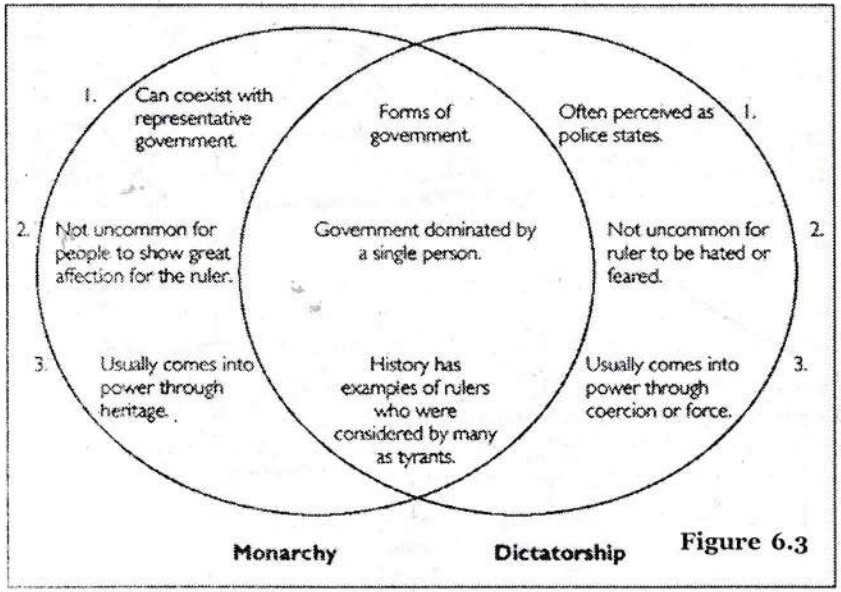


Figure 6.3

Another example from the language class is provided here that may be used to urge the students to distinguish between the two forms of autobiography and biography:

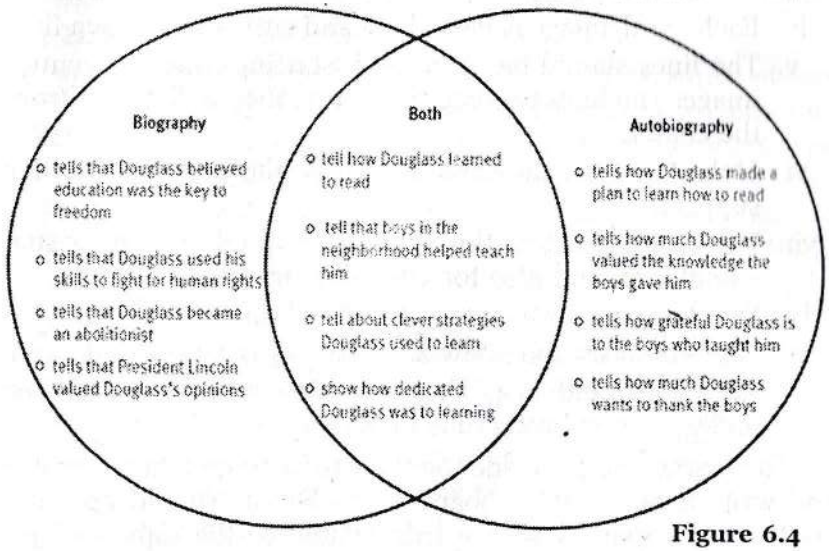


Figure 6.4

[iv] Mind Maps

A **mind map** is a diagram used to visually organize information. A mind map is often created around a single concept, drawn as an image in the center of a blank landscape page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those.Mind maps can be drawn by hand, either as "rough notes" during a lecture, meeting or planning session, for example, or as higher quality pictures when more time is available.Although the term "mind map" was first popularized by British popular psychology author and television personality ***Tony Buzan,*** the use of diagrams that visually "map" information using branching and radial maps traces back centuries. These pictorial methods record knowledge and model systems, and have a long history in learning, brainstorming, memory, visual thinking, and problem solving by educators. Buzan suggests the following guidelines for creating mind maps:

i. Start in the center with an image of the topic, using at least 3 colors.
ii. Use images, symbols, codes, and dimensions throughout your mind map.
iii. Select key words and print using upper or lower case letters.

iv. Each word/image is best alone and sitting on its own line.
v. The lines should be connected, starting from the central image. The lines become thinner as they radiate out from the center.
vi. Make the lines the same length as the word/image they support.
vii. Use multiple colors throughout the mind map, for visual stimulation and also for encoding or grouping.
viii. Develop your own personal style of mind mapping.
ix. Use emphasis and show associations in your mind map.
x. Keep the mind map clear by using radial hierarchy or outlines to embrace your branches.

The teacher may provide the topic to be written at the centre and write it on the blackboard. Then he/she should urge the students to come up with words related to the topic and jot them down in the way shown in the diagram below[cited by Buzan]. The students may then be urged to write a comprehensive paragraph on the topic using the words/concepts jotted down. The paragraphs may be presented in the class. This integrates reading, writing, speaking[presenting in class] skills and may be used for any subject.

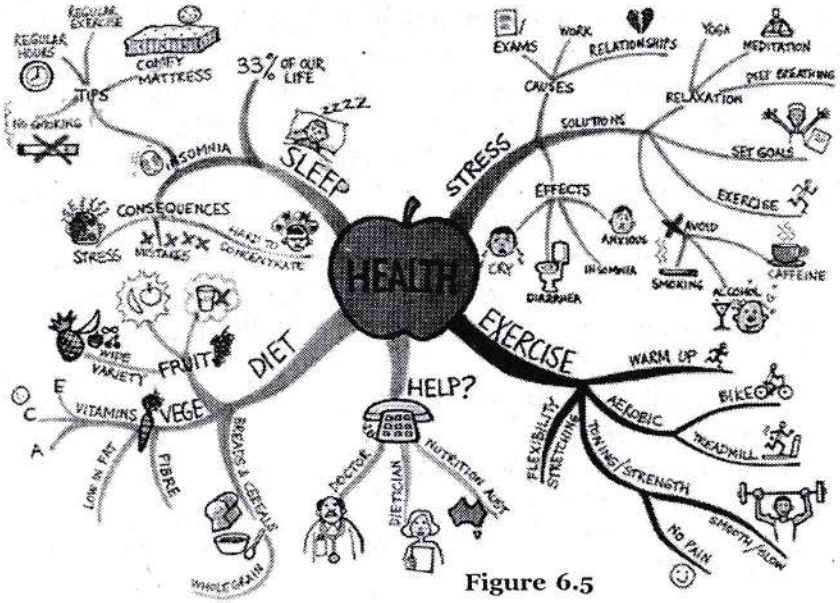


Figure 6.5

[v] Brainstorming:

Brainstorming is a group creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members. The term was popularized by ***Alex Faickney Osborn*** in the 1953 book Applied Imagination. Ideation sessions. Osborn claimed that two principles contribute to "ideative efficacy," these being:

1. Defer judgment,
2. Reach for quantity

Following these two principles were his four general rules of brainstorming, established with intention to:

a. reduce social inhibitions among group members,
b. stimulate idea generation
c. increase overall creativity of the group.

1. **Go for quantity:** This rule is a means of enhancing divergent production, aiming to facilitate problem solving through the maxim quantity breeds quality. The assumption is that the greater the number of ideas generated, the bigger the chance of producing a radical and effective solution.
2. **Withhold criticism:** In brainstorming, criticism of ideas generated should be put 'on hold'. Instead, participants should focus on extending or adding to ideas, reserving criticism for a later 'critical stage' of the process. By suspending judgment, participants will feel free to generate unusual ideas.
3. **Welcome wild ideas:** To get a good and long list of ideas, wild ideas are encouraged to have. They can be generated by looking from new perspectives and suspending assumptions. These new ways of thinking might give you better solutions.
4. **Combine and improve ideas:** As suggested by the slogan "1+1=3". It is believed to stimulate the building of ideas by a process of association.

DISCUSSION

Discussion is often regarded as conversation or as haphazard, almost aimless, ramification in and out of a subject. Properly understood, discussion is the art of reflective thinking and communication. It is usually oral and involves a group whose aim is to solve a problem cooperatively. The discussant, like the arguer, adheres closely to the logical pattern of thinking. He recognizes the awareness of a problem, focuses upon the definitions of terms involved in the controversy, analyzes the factors which cause the disturbance, states clearly the various hypotheses or representative solutions, weighs in turn both the advantages and disadvantages of each solution, selects that outcome which seems feasible and practicable to the group, and finally concentrates upon the program for setting up the solution as determined.

A group discussion is a forum where people sit together to deliberate or discuss issues given to them to bring out various perspectives and angles of the given issue in a wholesome manner. The most commonly employed forms of group discussion are as follows:

(1) Topic based,

(2) Case Study based.

Topic-Based Group Discussions are further divided into:

(1) Knowledge Based Topics
(2) Abstract Topics
(3) Controversial Topics
(4) Opinion Seeking Topics

(1) Knowledge Based Topics

Under this kind of group discussion, you require in depth information about the topic been given to you.

(1) You should be able to support it with facts and figures
(2) Your information should be substantial.

Examples:

i. Maths in everyday life
ii. Science a boon or curse
iii. Is terrorism the price we have to pay for democracy?

iv. Globalisation and Privatization
v. Privatization of Universities/colleges/schools
vi. Does India need a dictatorship?
vii. Global Warming

(2) Abstract Topics:

Under this type of a group discussion, the teacher gives a topic which is absolutely out of the box. Abstract topics are more about intangible things. These topics test the creativity of the students and their thinking ability.

Such topics can be interpreted in different ways by the students. In such topics, the teacher may judge the comprehension skills and communication skills of the students.

Example:

i. Where there's a will there's away
ii. 26 Alphabets
iii. Infinite Numbers
iv. A Walk to Remember
v. If you were born in the Mughal Period

Such topics do not require facts or figures but simply judge your imagination and how well you can associate it with you day to day life.

(3) Controversial Topics:

Such topics can lead to an argument, they're argumentative in nature. They are meant to generate controversy and at the same time, judge the analytical skills of the participant to see if he/she can think rationally, without any bias and arrive at a harmonious conclusion.

Such topics are also given by the panelists so that they can judge the maturity level of the students and they don't start screaming at other candidates., If as a student, you are not in favour of what the other candidate is saying, then you should be smart enough to put across your point candidly without / bashing the speaker.

Example:

i. Reservation should be removed
ii. Quota System should be abolished

iii. Science, arts , commerce and vocational education should be made optional areas from class VIII
iv. Beauty Pageants give a wrong impact on the women of India
v. Politics in India
vi. Reality shows- Should children be banned from coming in such shows?

(4) Opinion Seeking Topics

In such topics, candidates are asked to put across their opinions, their point of views. The panelists look for presentation skills when given such topics and also your ability to work in a team which means that your leadership skills are also judged.

Example:

(1) Women—boon to the society or bane to the society
(2) Love Marriage or Arranged Marriage
(3) Nuclear Family or Joint Family
(4) Nationalism—born or bane
(5) Are woman the greatest adversary of their own sex?

CASE BASED STUDY

Under a case based study, a situation or a scenario is left to students for an open discussion. The information about the situation will be provided to you, a problem regarding the same situation will be given, all you will be asked for is to resolve it.

Topics given during this type of discussion are more management related, for example: the panelists might give you a situation which could be a conversation/argument between an employee and the boss etc.

These are open end discussions, wherein nobody is right or wrong, using their thinking ability they decide what they can do in such situations etc.

The characteristic elements of discussion are those of argument. Each type pays strong allegiance to logic, fact, and testimony, the analysis and rejection of bad argument, the thorough organization of main and submaterials, and the accurate use of language.How do they differ? At every point the discussionist almost entirely ignores the techniques of

persuasion. Discussion, strictly speaking, aims chiefly to establish "truth" or facts and to secure a consensus of judgment on the basis of reason alone. When you join a discussion group, you disavow any propagandistic tendencies. This approach sets you off, sometimes sharply, from the debater, the salesman, or the typical arguer in the classroom or elsewhere.

BRAINSTORMING, DEBATING AND ARGUMENT

Brainstorming, Debating and Argument are often used interchangeably. Argument, as we have indicated, is the broader term. It applies to all methods, oral or written, that influence conduct and belief by rational or emotional means. Debate is characteristically controversy under definite rules. These include time limits, use of opposing speakers, the activities of judges, mainspeakers and rebuttals, and methods of audience voting. The writer of a first-rate forensic or complete argument may have his article printed in a reputable journal. He may, however, be a third-rate debater because of lack of ability to think quickly on his feet, to talk readily on the platform, or to use a hundred other arts of an experienced debater. Whereas argument was perfected and applied in early Greece, debate as it is practiced today in American colleges is a comparatively modern invention.

Skills Developed through Discussion, Brainstorming and Debate

Tasks like debate, discussion and brainstorming on given topics in the classroom irrespective of the subject taught in that class, leads to development of certain skills and abilities among the students. They are as follows:

(1) to select, frame properly, and analyze a subject;
(2) to gather and organize materials;
(3) to develop and test arguments and evidence;
(4) in debate to refute effectively;
(5) to express arguments in effective language;
(6) to deliver a speech or more informal talk effectively;
(7) to adapt the discourse to the audience; and
(8) in argumentative speaking and writing, especially in debate, to use persuasive devices.

FUNCTION OF REFLECTIVE THINKING IN BRAINSTORMING, DISCUSSION, AND DEBATE

Argumentative writing and speaking, whether general argument or specialized discussion or debate, is primarily logical rather than emotional communication. Although representative techniques of communication by language are involved in argumentation, reason predominates. The old admonition to judge a debater by his skill in evidence and argument more than by delivery or language still holds. The audience, speaker, occasion, and subject in which argumentative discourse functions assume that rational treatment, intellectual exchange, and logical conclusions should prevail. Aristotle wrote his Rhetoric partly to restore to a central place logical materials in communication. His contemporaries tended to exalt style and presentation. Aristotle gave full weight and place to audience appeals but insisted, and rightly, on the primacy of rational judgments. Each of Debate, Discussion and Brainstorming thus involves reflection or reflective thinking that is necessary for a complete and comprehensive understanding of any subject.

John Dewey in *How We Think* (1933) elaborates the following steps:

i. recognition of a felt difficulty;
ii. the description or diagnosis of the problem;
iii. the description of representative hypotheses or solutions of the problem;
iv. the rational elaboration of these suggestions and the testing of each;
v. experiment and verification leading to acceptance or rejection of the preferred solution

Essentially, intellectual thinking and expression are based on examinations of facts and on the principles or conclusions to which these facts or phenomena point. We bridge the gap from the well authenticated to the relatively unknown. The exploration ends in some sort of conclusion (a picture or perception of what should be done). Conclusions that grow out of this deliberativeand evaluative process we call judgment or inference. The reasoning process, then, is made up of a series of inferences. The method in arguing is to provide judgments or inferences or reasons that the recipient may follow and accept. The widely

accepted steps of critical thinking needed for discussion, debate or brainstorming on a given topic are—

1. **Weighing of Facts:** The arguer or discussant first confronts the alleged facts that underlie the "felt difficulty." These materials he evaluates with respect to their accuracy, their completeness, their consistency, and their harmony with all other relevant data. He frames his queries as impartial questions and secures whatever disinterested replies are available to him. He thus focuses on "fact" and does so as a critical observer. He has somewhat the spirit of any scientific investigator.
2. **Weighing of Language:** A reflective approach will necessitate the students' sharp scrutiny of language in its relation to thought itself. Does language adequately convey what is intended in the symbolic interpretation of facts, principles, propositions, and conclusions? Are the formal definitions intelligently and functionally conceived? Are the words and phrases throughout the discourse, as used by them or by others, referential, concrete, and contributory to clear thinking? Again, by the aid of impartial and intelligent inquiry, they will check these language usages and thus demonstrate critical thinking of no mean order.
3. **Weighing the Analysis of the Subject:** Still another aspect of one's controlled evaluation of argumentative speaking and writing will be his review of the issues and partition (chief propositions to be developed). What, exactly, is the problem? What main and sub-issues are at stake? What concrete propositions are developed? What important ones are omitted? These and similar lines of investigation will occupy his thinking. Power of successful analysis characterizes the fruitful thinker. At no point in mental orderliness is constructive reasoning more apparent than in this formulation of main and subdivisions and in the criticism of them.
4. **Weighing of Organization or Structure:** Organization is the complement of analysis. The order of the materials, the selection of ideas and their relatively full treatment, the devices by which relevancy, emphasis, and coherence are achieved-all require critical review. Structure is no mere accessory to discourse. Organization is a mirror of the thought pattern. The speech organizer and the critic of such

arrangement will test the structural texture of the thought and so will detect the presence or absence of logical validity in his own and others' speeches and writings.

5. **Weighing of Inference:** What is inference? Roughly it is synonymous with reason and reflective thinking. From facts or general statements based on facts we draw conclusions. This movement from fact or premise to conclusions is reasoning or inference.

1. Inference and orderly thinking: Reason and reflection occur when we mentally explore and take up a position in a heretofore undiscovered region. This thought movement is controlled not by chance or whim, but by careful inspection of the facts and principles at hand and by a cautious examination of whatever facts and principles are only dimly seen. Inference is the ability to see and describe connections between terms and statements whose close association may not be immediately apparent. It is guessing, but judicial guessing, based not on "hunches" but on methodical survey of the probabilities and hazards accompanying the new stand (conclusion).

A student may view, for example, the connection between dictators and international wars. He notes that these two phenomena occur together or that wars follow the rise of dictators. There seems to be an obvious connection. He may reason, then, "Dictators breed international wars" (one proposition). Later the History teacher may then help the student to refer to the history of 1925 to 1945 and examine the rise and fall of Hitler and of Mussolini. "These were pure dictators," he may conclude (a second proposition). Then the association of his first and your second propositions becomes clearer to him. Thus he concludes, "Hitler and Mussolini were among the potent causes of World War II." This experience of identification and association of terms and of statements drawn from such terms constitutes the method of inference or argument.

2. Inference and an order system: Inference is a description of the relationships of various facts, groups of facts, laws, and principles. The good reasoner quickly sees and understands these relationships. He views the underlying connections. He notes that events or movements are casually connected; that certain phenomena always occur in exact harmony or association with other phenomena.

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