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ABSTRACT

In order to promote critical thinking in young children, particularly children ages 5-8, teachers need to understand skills and dispositions of critical thinkers. This paper discusses these skills, dispositions, and the appropriate classroom climate, within the context of pedagogy, along with learning activities for kindergarten and primary classrooms. Piaget's concept of autonomy is asserted as an important aspect of critical thinking, and the development of thinking skills is compared to the development of language in children. Developmentally appropriate practices are useful for incorporating thinking skills and dispositions into the curriculum. A list of skills and sub-skills necessary for adult critical thinking is given, along with a discussion of appropriateness for emphasis with young children, including the following: (1) interpretation; (2) analysis; (3) evaluation; (4) inference; (5) explanation; and (6) self-regulation. To emphasize these skills appropriately, teachers of young children should emphasize and model the following dispositions: (1) curiosity; (2) open-mindedness; (3) fair-mindedness; (4) flexibility; (5) organization; (6) understanding of other points of view; and (7) emotional maturity. Teaching techniques best suited for promoting critical thinking are also discussed, including: (1) developing questions; (2) teaching problem solving; (3) teaching conflict resolution; (4) using cooperative groups; and (5) developing a dramatic play corner. Contains nine references and a six-item list of additional helpful materials. (BGC)

Developing Minds: Critical Thinking in K-3

by

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RUNNING HEAD:
Critical Thinking in K-3

Teachers who use developmentally appropriate practices are doing more to promote critical thinking than traditional teachers who believe children are too young to think well. However, in order to best promote critical thinking, teachers of young children need to understand the skills and dispositions (attitudes) of critical thinkers, and be able to promote a classroom climate which develops such cognitive skills. The purpose of this presentation is to specify critical thinking skills and dispositions which are appropriate for primary children. A brief description of the developmental process of thinking in young children is followed by a description of critical thinking in adults. Skills, dispositions and classroom climate will be discussed within the context of pedagogy and specific learning activities for kindergartens and primary classrooms.

From a developmental perspective, the process of growing toward being a critical thinker occurs very early in life. A necessary characteristic of critical thinkers is autonomy. As infants move into the autonomous stage of toddler hood the seeds of critical thinking have the potential to grow. "Autonomy in the Piagetian sense refers to the ability to govern oneself. It is the opposite of heteronomy, which means being governed by someone else" (Kamii, 1991, 382). In toddler hood the development of autonomy occurs when adults promote the toddlers' right and ability to make personal judgments. Toddlers whose curiosity and sense of adventure are shared by adults, and whose daily decisions are given respect, are more likely to become critical thinkers.

Five to eight year olds have developed a sense of autonomy that includes a sense of wonder and curiosity, and an ability to make choices. During the primary years, autonomy and curiosity continue to grow and new skills needed for thinking emerge. Primary children sort and organize what they know, build each new schema from previous knowledge, and connect schemata into a personal way of thinking and knowing (Kamii,1991). What children learn as well as how they learn influences their ultimate ability to think critically.

The development of thinking skills can be compared to the development of language. In early childhood and until children enter school, language is learned naturally and informally. Children learn language in dialogue with others. They listen, respond and interact with fluent adults. By the time children are five years old they have learned nearly 5,000 words and under typical circumstances have the ability to use nearly all of the grammatical structures of their native language. When children enter school they begin the process of learning that written language is more formal, more precise and somewhat different from spoken language. Schools have developed many good frameworks for teaching literate language skills to primary aged children.

The development of thinking follows a similar pattern. Young children begin to use their ability to build concepts, connect new understandings to old, and develop new ideas and concepts from what is known. Piaget called this early period of thinking intuitive. Children make errors in

their understanding as they build new concepts, but these will naturally be corrected as children develop better reasoning ability and more knowledge. As children begin school they slowly learn that thinking can be more formal and more precise, as language is. However, schools have not developed precise frameworks for teaching critical thinking skills as they have for literacy skills.

The primary school curriculum has focused on literacy. Within the context of becoming literate, children can also begin the process of developing critical thinking skills. The process is more likely to occur if teachers are familiar with the skills and dispositions of critical thinkers, and use appropriate pedagogy to begin to encourage more precise thinking. In the primary years this is still primarily an unconscious process for children. Metacognitive knowing is still difficult for young children. However, the critical thinking skills and dispositions appropriate for five to eight year olds can be incorporated into the curriculum. Developmentally appropriate practices as defined by Sue Bredecamp (1988), are especially useful toward that end.

The concept of critical thinking has received a great deal of theoretical and research attention in the last few decades. Most experts have agreed that critical thinking as opposed to other forms of thinking requires more than an understanding of and the ability to perform logic. Thinking critically involves a recognition of your own and others' attitudes, beliefs, and points of view about a particular subject. Often the best answer to a problem requires not just indisputable logic, but an understanding of various points of view. Critical thinkers have both the desire and the ability to think clearly and precisely. They recognize that some conclusions are more reasonable than others. Critical thinkers are willing to explore their own ideas as well as the ideas and questions of others. They are continuously learning and exploring in order to change and improve their own thinking (Paul, 1990).

After decades of research and disagreement experts have recently come together to agree on a definition for critical thinking. Led by Peter Facione, a panel of forty-six experts was convened by the Committee on Pre-College Philosophy of the American Philosophical Association. The panel, each member considered an expert in critical thinking by peers, came to a consensual definition for critical thinking. Their definition of critical thinking reads as follows:

> We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual consideration upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one's personal and civic life. While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in

seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus educating good critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insight and which are the basis of a rational and democratic society (Facione, 1990, 26).

A shorter definition might be that critical thinking is reasoned judgment. Being able and willing to use reasoned judgment requires some specific skills and dispositions. Those skills and dispositions must be supported in the early years in order for an individual to be a critical thinker in adulthood.

The skills and sub-skills necessary for adults to engage in CT have also been agreed upon by the American Philosophical Association and they are (Facione, 1990, 12):

Skills	Sub-Skills
1. Interpretation	Categorization Decoding significance Clarifying meaning
2. Analysis	Examining ideas Identifying arguments Analyzing arguments
3. Evaluation	Assessing claims, Assessing arguments
4. Inference	Querying evidence Conjecturing alternatives Drawing conclusions
5. Explanation	Stating results Justifying procedures Presenting arguments
6. Self-regulation	Self-examination Self- correction

Many skills can be discerned from the list of sub-skills which are appropriate for young children. Categorizing (putting objects and ideas in groups), decoding (figuring out how symbols are used), clarifying meaning (describing ideas), examining ideas (wondering about) , conjecturing alternatives (using what ifs), drawing conclusions (making decisions), stating results (describing what you observe), and justifying (giving reasons) are activities included in any good developmentally appropriate early childhood curriculum.

The specific thinking skills which could be included in a primary curriculum are:

Categorize
Explain
Understand
Develop Alternatives
Make Decisions
Disagree
Give Reasons
Evaluate Decisions

These thinking skills can be a part of most curricular content. For example, if the children are studying caterpillars there are many categorization schemes. The best categories, of course, are the ones the children develop. Once categories are designed, children should give reasons for the logic of their categories. Small groups of children may devise different categorical systems, and could then explain to others the reasons for different systems. As they continue to study caterpillars, they could be encouraged to ask questions and suggest ways of answering those questions. Lists of questions could be posted in the classroom and time should be given for thinking about new questions, as well as the development of alternative means for answering the questions.

It may seem that the above activities are ond five year old abilities. But, five year olds can organize objects and ideas, as well as give reasons for their actions some of the time. However, since autonomy is essential to thinking, young children must always be allowed to say, "I don't know." Children under age eight do not have good metacognitive abilities, but they do think and reason at a preoperational level. Their thinking must be encouraged and enriched in order that it may improve. In fact, several recent studies have demonstrated that the skills suggested here are possible and will promote better thinking at later ages (Solof and Houtz, 1991; Ellis, 1988).

Critical thinking skills can only be taught in an environment that encourages the children to ask questions, to devise ways of answering those questions, to make decisions about how to proceed, and to evaluate the quality of their answers. These kinds of activities promote specific thinking dispositions or attitudes in the children, dispositions which must be modeled by the teacher. The teachers of primary children could focus on the following dispositions:

Curiosity
Open-mindedness
Fair-mindedness
Flexibility

Organization

Understanding others points of view

Emotional Maturity

Curiosity, fair-mindedness, and flexibility are natural to young children. If teachers develop instructional environments and classroom cultures which support autonomy in thinking then these dispositions will become integral components of the children's attitudes about learning.

Emotional maturity, of course, refers to the emotional maturity level of a typical five, six or seven year old, and can be encouraged and taught. Children can learn to understand their own emotions and the role emotions play in behavior. They can learn to understand others emotions in order to develop empathy which is necessary for open-mindedness, and understanding anothers point of view (Goleman, 1995). Emotional maturity does not happen automatically. It happens when children have models of maturity (teachers), and environments which support maturity. Direct instruction would include labeling emotions for children to identify in themselves and others, and pointing out body language that give clues to emotions. We know that children read body language better than many adults, but they often need to be taught to take the other person's feelings into account when responding to situations. Direct instruction can also include the teaching of the communication skills of observing, listening, and stating your own point of view. Good negotiation skills are the outcome of this instruction.

The teaching techniques that are best utilized to promote critical thinking begin with the modeling of thinking dispositions. This means that teachers need to be curious and to focus their curiosity on the children's interests. Teachers must be learning new things that are shared with the children. Discovery must occur often! Teachers must be organized. Organization must occur in all parts of the environment, schedule, and curriculum. Critical thinking requires organized thinking which is often flexible but never chaotic. Teachers must be open-minded and listen to other points of view. Teachers must be emotionally mature. A second technique is to explain thinking. This is especially important for primary children who do not understand their own thinking well. One approach might be for a teacher to think aloud using phrases such as "I am wondering about. . . . ", or "I am thinking that. . . " Another strategy or technique is to encourage interaction among students. Developmentally appropriate classrooms already encourage interaction among students. Critical thinking environments also encourage children to disagree respectfully, to listen to reasoning, and to understand differing points of view.

Teachers can also use the language of critical thinking (Tishman, Perkins, and Jay, 1995). Children learn language in dialogue with others. Adults who listen to, and talk with children using thinking language will teach children the language of thinking. Some words that

can be included in dialogue with children in the primary years are: appreciate, assume, believe, conclude, criticize, detect, disbelieve, discover, evidence, explain, guess, hypothesize, inquire, investigate, judge, know, observe, ponder, prove, question, reason, remember, research, study, think, understand. This is certainly not an exhaustive list. A teacher of older primary children could choose a few words from the list and post them. The words should then be used in daily interactions with the children. Thinking words should become a part of the language of the classroom.

The following dialogue with children demonstrates the use of thinking words:

Teacher: In the story we just read about Swimmy, why wasn't Swimmy afraid?

Student #1: He wanted to play.

Student #2: No, he wanted to see things.

Teacher: O.K. Now, we have two different opinions about why Swimmy wasn't afraid. Does anyone else have an opinion?

Student # 3: I think Swimmy wanted to play because he said he wanted to play.

Student #2: But, look the word SEE is bigger, so he wanted to see things.

Teacher: Now, you are giving reasons for your opinions. Is it possible for both of you to be right?

This example demonstrates one approach teachers can include in the language of thinking in their classroom discussions. Remembering that children naturally learn new language as it is used on a daily basis will emphasize the importance of using thinking words regularly in classrooms.

The last teaching technique to be discussed here is to give supportive feedback. Teachers must recognize specific student skills and dispositions when they occur. Feedback can describe and encourage skills, then suggest additional ways of thinking. For example a teacher may say, "I appreciate the respectful way you are disagreeing with each other. Now each of you try to think of more reasons for your point of view." Give them time to think! Research has demonstrated that the most beneficial strategy for improving thinking even for young children is to give them a time to think (Perkins, D.N., Goodrich, H., Tishman, S., and Owen, J. M., 1994). Encourage your students to take at least one minute to think of one more reason. Give thinking time several times during a lesson.

As children are taught to listen, reflect, and explain their own ideas a classroom climate is built which includes the following components:

Trust

Good Communication Skills

Safety to Disagree

Open-Mindedness

There is a direct connection between the development of thinking dispositions and classroom climate. It is not possible to develop critical thinking dispositions unless the climate promotes those dispositions. Dispositions are not directly taught, they are modeled and encouraged and grow in the appropriate climate, much like seeds grow in the right environment. During the primary years, providing a climate which will promote thinking dispositions or attitudes is perhaps the single most important component of a learning environment. For teachers who want to begin to promote critical thinking, the classroom climate is first and foremost.

Some activities that can be developed to promote both thinking skills and dispositions are as follows:

Develop Questions

Post the questions on the wall

Invite questions with each unit

Invite the children to choose units

Teach Problem Solving

Identify the problem

Brainstorm possible solutions

Children evaluate and choose a solution

Try out the solution and evaluate it

Teach conflict resolution

Each child describe their problem

Describe feelings and ideas

Ask about possible solutions

Children agree on a solution

Use cooperative groups

Development of a dramatic play corner

1. The goal of the activity is to promote the children's CT skills and dispositions.

2. The activity begins with the teacher leading a class discussion which tries to answer the question: What shall we pretend in the dramatic play corner? Some possible answers include the beach, post office, store, house, school, dinosaurs, car repair shop, etc. The children must somehow agree on what to pretend. You can take several approaches to their decision making such as voting, consensus, etc.

3. Next question: What will we need to put into the play corner in order to pretend that we are at the beach. Make a list and post it.
4. Next question: Where could we get these things? Make a list and post it. Some things you may bring in, some the children may bring in, and some may be built by the group.
5. Leave the play corner up for at least a month, adding to the materials, language, etc. Include questions about the play corner on charts on the wall, in coloring centers, during dictation, etc.

Summary and Conclusion

Developmentally appropriate practice will help primary teachers begin to promote thinking. However, in order to encourage the children's developmental progress toward critical thinking, teachers need to understand the skills and dispositions necessary for critical thinking. Of primary importance are the dispositions or attitudes toward thinking and learning which will increase children's natural curiosity and autonomy. Children need to develop an ability to recognize differing points of view and a willingness to explore alternatives. They need to be organized in their problem solving and have good communication skills. The teacher's role is to create an atmosphere which encourages these attitudes. The teacher models open-mindedness, encourages differences of opinion, and asks for reasons for conclusions. Primary children will then be able to develop critical thinking skills and more importantly, critical thinking dispositions.

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