THINKING

1. Definition and Development

Thinking, as described by Dewey, is a 'stream of consciousness' and the everyday 'uncontrolled coursing of ideas through our head'. It refers to the conscious process of information that takes place in the mind to find a thoughtful solution to a problem. In other words, when we think, we analyze the many components of a particular situation, problem, and puzzle by breaking it down into its components to try to understand it, then to build it up again into a novel final form in which the components have been put into wholes (cf. Sternberg. 1995).

Addressing the issue of thinking development, Piaget argued that the development of thinking is affected by: *maturation, activity, and social experiences.* First, Maturation concerns the changes that occur spontaneously and naturally and which are genetically programmed. These changes occur over time and are relatively unaffected by the environment, it remains nevertheless important that the individuals in their early stages of life should receive the necessary and appropriate nutrition and psychological care to grow healthy and sane. Second, Activity means to truly participate in the elaboration of thought through sharpening curiosity and the exploration of surrounding world to finally form a clear representation of what we do. Hence, taking part in the understanding of the environment and thus in its transformation means altering and sharpening our thinking processes, making them every time different and more elaborated. Last, living alone away from society and people would keep cognitive development in its first stage; exchanging information and experiences with other society members fosters cognitive development.

For Vygostsky, life long process of cognitive development is greatly (if not totally) dependent on social interaction, it is a 'scaffolding' or an instructional process. In other words, the learner becomes able to do something which he might not been capable of doing without an adult guidance of the help of 'a more capable other'.

In the educational context, teaching should focus on learners' process of thinking to develop a more responsive mine (Oxford, 1990), and help learners think strategically to learn better. In Dewey's view, the development of reflective thought is the most important goal of education. It enables individuals to take control of and responsibility for their own thinking in order to participate effectively as a member of a democratic society.

2. Categorization of Thinking

Psychologists come out with a threefold categorization of thinking: problem solving; decision making; and reasoning.

Problem solving is creating solutions for particular problems, it encompasses also finding new solutions and using strategies to overcome a problem. Moreover, problem solving is going beyond the simple application of previously learned schema of rules (cf. Woolfolk 2004). Problem-solving requires to *1. understand the problem*; and *2. to solve it*. Understanding the problem is half way through it, because if we do not know what we are going to do, then we may take recourse to many different approaches without necessarily reaching our goal. According to Sternberg (1995), after we understand the problem, we formulate a strategy and we seek for solutions by representing and organizing the information we have stored in our memory, and finally we evaluate and choose the most satisfying one.

For problem-solving approaches, Matlin (2004) suggests three heuristics which are: the-Hill-Climbing Heuristic, the Means-and-Ends Heuristic, and the Analogy. The first is generally used when we reach a choice point in solving a problem, we simply select the alternative that seems to lead most directly towards our goal. The second bears the name of means-and-ends because the problem solver has to know and identify the 'ends', that is what he wants to do, and then to figure out the 'means' to be used to reach those ends. In other words, when we face a problem, we try to divide it into parts; smaller problems/ subproblems. Last, using the analogy approach means solving a problem in the same way we have solved a previous and similar problem. The more we solve problem, the more we are inclined to use this approach in solving problem than another one because analogies have pervaded our thinking, which is not a bad thing after all since we have armed ourselves with problem-solving strategies that we have picked up from our [human] experience, that is human thought.

When we have different choices and we select one choice, then we are *taking a decision*. In some situations, we establish rules (e.g. when we buy something, we take into consideration money available, the trade mark…). However, some other times, we do not establish rules and our decision-making could sound arbitrary for we do not know whether our decision is correct or wrong. Generally, in making decisions, we always 'seek pleasure and avoid pain' (Sternberg 1995:348). Hence, '*the utility maximizing theory'* emphasizes that all decision makers seek to attain one goal; they make decisions for a positive utility wishing to maximize pleasure, and in the same time minimizing pain, in this sense, to be sorry for something could be considered as pain.

Many times we hear people saying that the decision we have taken is the best one, the ideal one. Decision theorists assume that we do not really make ideal decisions simply because decision makers in general do not operate in ideal circumstances. If they operated in ideal environments, then there would be no need to make decisions and making decisions would be only for the form, but we are away from such an environment. People, in fact, differ in their ways of portraying the environment around them, and everyone has his own way of seeing what best fits him, and maybe because of this that when one someone takes a decision which he sees goes well with the goal he wants to attain he then claims that he has taken the optimal decision.

When we try to solve a problem by choosing the most appropriate solution by evaluating opportunities and selecting one option above any others then we are *reasoning*. To reason is also to try to understand a problem and to make judgments based principally on facts and evidence to arrive to making a decision or drawing a conclusion. When we reason, we choose among many alternatives, but the decision we make is not always a well-thought one; it could not be objective but in most cases, it could be rather personal, and hastily taken. Besides, the consequences of such a decision are not always clear, but remain subjected to verification over time.

Reasoning is often twofold: **deductive and inductive**. Deductive reasoning is when we proceed from general rules to reach a logical and specific conclusion; to reason deductively is to proceed from a set of general premises to attain a specific -and an expected- logical conclusion. A premise is an action or an idea on which the act of thinking is based. However, reasoning inductively is following a process of reasoning from part to whole (Sternberg. 1985), or from specific facts and observations (especially) to reach a general conclusion that may explain what has been reasoned over or observed. The conclusion that one reaches through inductive reasoning is not [necessarily] all truth, but most often –if not always- a probable conclusion.

3. Ways of Thinking

3.1. Critical analytic thinking

Critical thinking is to decide reasonably and reflectively on what to believe or do, and to make reasoned judgments. The process of critical thinking involves the careful acquisition and interpretation of information, and use of it to reach a well-justified conclusion. Basically, it is using criteria to judge the quality of something, from cooking to a conclusion of a research paper. In essence, critical thinking is a disciplined manner of thought that a person uses to assess the validity of something: a statement, news story, argument, research, etc.
To think critically, Edward Glaser emphasizes the importance of:

Persistence: considering an issue carefully, and more than once
Evidence: evaluating the evidence put forward in support of the belief or viewpoint
Implication: considering where the belief or viewpoint leads - what conclusion would follow; are these suitable and rational; and if not, should the belief or viewpoint be reconsidered?

Analytic thinking involves additional process:
-Standing back from the information given
-Examining it in detail from many angles
-Checking closely whether it is completely accurate
-Checking whether each statement follows logically from what went before
-Comparing the same issue from the point of view of other theorists or writers
-Being able to argue why one set of opinions, results or conclusions is preferable to another
-Checking for hidden assumptions.

3.2. Creative thinking

Think creatively means to use your inspiration and imagination to solve problems by looking at them from unexpected perspectives. It involves: discarding the obvious, leaving behind traditional modes of thought, and throwing away preconceptions.

3.3. Practical thinking

Thinking in practical way means having simple common sense, and being able to adapt to any environment quickly and effectively. Practical thinkers generally -Prefer to react promptly to situations and problems rather than being thoughtful   -Are good at making things

References
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