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Mind Tools for Intellectual Produce

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ABSTRACT

Intellectual produce is the result of the interaction of diverse mind processes and research aims in the study of reality. It comprises three interactive mind processes arranged in a logic frame: identification of objects and concepts, analysis of contrasting facts or ideas, and critic judgment of cognitive results that leads to solid tautologies in terms of validation and verifiability and are expressed in the consolidated report. In this way, the scientific and social impact of mind tools result in significant sprout of intelligence and systematic mind operation.

Keywords: intellectual produce, mind process, judgment, systematic mind operation.

AVAILABILITY OF MIND TOOLS

Students worldwide have to learn matters by heart and, sometimes in a compulsory way since they are elementary school-students. Some educative programs deal with schemes, well-elaborated classes and selected teachers to display knowledge through expositions. Matters comprise large amounts of information that is usually directed to be learnt by heart, instead of having information directed to explain the reality after serious and rigorous mind processes of identification, analysis and critical judgment. In this context, students not only need to identify objects or analyze them by questioning, but also start a judgment process to state what is good or bad when using a mind tool in a logic framework, in an "investigation/research oriented approach to student learning" (Boardman, 1999). The students will be able to use again and again the mind tool, in order to have an intellectual produce, knowing that "much of the work students do is investigative and open-ended, and require students to gather real data, discuss them with their team-mates, and prepare a report that involves synthesis, integration, and interpretation". In many cases data are shared among teams and additional information must be obtained from outside sources to complete the assignment. Students must make decisions about how much information is sufficient and how deeply to dig into supporting material [2].

A physical tool, like a shovel, is always used for digging holes, because its purpose is that. The proposal of the logic frame of mind tools (Table 1) is to obtain an intellectual produce systematically. Students develop their mind abilities by elaborating and performing intellectual works with the help of these tools. Then, they report their findings by following a syllogism pattern thus producing organized information that is schemed as an essay, a monograph, a thesis, a scientific article, or other written text. In a way, what it is being explained in this article is the method for producing syllogistic information, based on one's mind way of work or process.

Identification of objects and concepts used in the study	Analysis of cause-effect: questioning	Critical Judgment of cognitive results
Description of objects	Analysis.	Following a syllogism pattern for producing:
Schemes.	Discussion.	
Enumeration.	Synthesis.	- an essay
Definitions.	Interpretation of facts.	- a monograph
Narrations.	Deduction.	- a thesis
Reconstruction of facts.	Induction.	- a scientific article
	Arguing.	
Evocation.	Contrasting.	- other
Explanation and interpretation.	Development.	
Illustration.		
Evocation.		

Table 1. Logic Framework for Intellectual Produce

The Logic Framework shows three major areas of the process, identification, analysis and critical judgment. *Identification* of objects and concepts is the starting point in the mind process, where simple mind operations like description, drafting, numerating, enunciating, stating, naming, narrating, reconstructing, evocating, explaining, defining, and illustrating needn't be interpreted, but recognized or identified properly and adequately.

Analysis constitutes the second most important mind process. At this stage, the processes involved are questioning, analyzing, discussing, synthesizing, interpreting, deducting, inducing, developing, arguing, and contrasting. The previous knowledge in this step is administered properly in order to create a battery of questions which orientate the discussion and interpretation of the matter into study, furthermore, the synthesis process let us tune the supporting information to be displayed on the next stage. The new knowledge produced through the inferences and deductions serves greatly to organize the knowledge building that is being treated in work teams or with the own personal work. In a way, this stage comprises many bypasses for the critic judgment displayed in the next step.

The third area is the *critic judgment* of cognitive results and constitutes the target area where the building of tautologies is the main characteristic, then, validation and verifiability of deductions and inferences are activated to reach solid knowledge about the facts, accordingly to the reality in study. This final aspect means to assure cognitive solidity of

knowledge to be expressed in the report. The importance of this phase is because the final intellectual produce is judged by specialists. They have the responsibility to assess the new knowledge to be included in the body of science after a socializing process. The results at this stage are unexpected, authors are pleased of concluding their current research, but scientific community can accept or reject the conclusions of the study.

KNOWLEDGE OF MIND PROCESSES AND FUNCTIONS

Mind faculties are being developed in children at different educative levels. They are highly motivated to precise information, describe, identify, differentiate, discriminate, add and arrange objects and concepts. [4] presents detailed arguments for reflective intelligence that is one's broad-based strategies for facing problems, for learning, and for approaching intellectually challenging tasks. It includes attitudes that support persistence, systemization, and imagination. It includes self-monitoring and self-management. Each of us can become more intelligent. We can become more intelligent through study and practice, through access to appropriate tools, and through learning to make effective use of these tools.

The evolution of mind and intelligence in three dimensions neural, experiential, and reflexive[4] run parallel to bio-psychic development of students since elemental levels. Analysis and synthesis are also present during the school work, but it is hard to make them evident, unless students are conducted into the acquisition, processing and producing information [5] at high school levels and mainly at university level, by recognizing their metacognition, and exercising problem solving with the use of two or more information sources, hypothetic thought, reflexion, and inductive-deductive reasoning [1]. A cognitive scientist who has written extensively in the area of human-machine interfaces begins his book [3] with a discussion of how tools (physical and cognitive) make us smart. In many areas, a person with appropriate training, experience, and tools can far outperform a person who lacks these aids.

[2] recognizes the differences of cognition and acknowledging that people have and the different mental strengths and contrasting cognitive styles they posses. He argues that the students achieve academic success due to their strengths in critical reading and calculation that lead them to reach higher scores on paper and pencil instruments. Intelligence is the ability to solve problems or fashion products that are valued in one or more cultural or community settings, with a particular representation in the brain, like schemes or processes.

[5], for example, focuses on just three main components:
- Practical intelligence--the ability to do well in informal and formal educational settings; adapting to and shaping one's environment; street smarts.
- Experiential intelligence--the ability to deal with novel situations; the ability to effectively automate ways of dealing with novel situations so they are easily handled in the future; the ability to think in novel ways.
- Componential intelligence--the ability to process information effectively. Includes metacognitive, executive, performance, and knowledge-acquisition components that help to steer cognitive processes.

If we only maintain students with identification tasks, they will develop their evocative memory. If we try them to perform analysis and reflexive tasks, they will be involved in complex mind work. But, if we make them to assess their intellectual produce, they will reinforce their critical thinking, initiative, originality, and proposals for human problem solving. In a way, it is the concern of educative police makers to orientate the curriculum towards a highly and rich educative sustainable process, full of opportunities for students to develop their own society. If adults are not able to identify the social needs, nor planning and playing the formative roles, we will only have weakly developed societies.

UNIVERSITY INTELLECTUAL WORK

Young people, who are preparing to become professionals by attending to a University, need to *enhance* a set of professional and academic competencies which were achieved in previous educative levels. The transmission of effect-knowledge, abilities to generate knowledge, capacity to assimilate and perform new knowledge in order to grow intellectually and produce social well being, constitute important elements of adequacy to the current globalization phenomenon. First, the acquired competencies are to be reinforced, and the others will be found and developed according to the new requirements and exigencies of the academic and professional world.

The intellectual work for a university student is oriented necessarily to the development of both academic and professional aspects; a third aspect, in certain universities is the culture of the spiritual aspect too, which, in turn, may be the most important, depending on each individual and its proper purpose of life. First, a set of natural activities are developed in the academic aspect, where matters about life and universal knowledge are exercise in order to keep and maintain in the same state the *major knowledge* –the knowledge-source of scientific research. Second, the professional aspect is closely related to the enhancement or learning of labour competencies, that is the prevision a university assumes for having its graduates in optimum conditions of competitiveness in their society. However, as it has already stated above, certain universities have their axiology centred in culturing internal proper life –the culture of a human person- in this way, its efforts are directed to reinforce and practice values tending to join faith and science.

The result: a graduated student –at the end of its university formation- could be academically prepared, but professionally incomplete; inversely, it could be professionally complete, but academically deficient. A third classification could be: a human person academically and professionally formed to serve other people in their society. The latter means that the student has had an integral and unique formation in a field of knowledge where he or she has a prudent performance, abilities to increase well-being and happiness with a sustainable work in term of seriousness, qualified major knowledge, critical thinking to understand social needs, and propose reasonable, creative and positive alternatives for social problem solving.

CRITIC JUDGMENT OF INTELLECTUAL PRODUCE

The intellectual produce at elemental and high schools are usually judged by the teachers, and the best scores are reached by students who can identify or describe objects, phenomena or circumstances. Evocative memory is well developed in this kind of judgment and exigency. School boys and girls work with their

great efforts to evocate names, schemes, passages, phenomena, instead of being involved in reflexive and analytical efforts to give alternatives for different problems. The result of an evocative work is the intellectual file which is pernicious in the development of society, because of the lack of meaningful alternatives for a change.

Current globalization discards professionals whose formative intellectual training has been based on activities of identification and association of events, in other words, centered on the development of the evocative memory. Most university students possess these competences from their former educative system. However, a new concept of university work has the challenge to offer alternatives of educative strategies to be used in their current formation and subsequent performance of their profession. The work is to be based not only on diverse research tasks since the beginning of the career, but also on the development of cognitive strategies for a complex process of information through mind tools for an intellectual produce. In this case, the produce is supported on evidences such as syllogistic reasoning, tautologies and solidity of knowledge; which are expressed on standard formats of monographs, scientific reports, thesis, articles, essays, and other papers.

The next important problem is the assessment of the intellectual produce, by analyzing the way it is produced. This means to assess it according to the phases involved in it. Two aspects are to contrast here, one is the traditional and sagital evaluation of knowledge, the other is the assessment of the gradual intellectual produce.

LEARNING ASSESSMENT BASED ON *SAGITAL CUTTINGS*

If the purpose of an educative system is to evaluate the ability to identify objects, evocative memory is used for it. Then, the high the score, the high acquired effect-knowledge the student could capture from his readings and notes. But if the purpose is to assess the enhancement of knowledge gradually in order to have an intellectual produce, the route is reflexion and reasoning. The first type of evaluation is done by means of "sagital cuttings", (see Figure 1) where the *quantity of knowledge* is measured through bimonthly cuttings in a scholar period. These cuttings constitute psychological and social traumas for students trying to have an explanation about life and general facts.

It is to wonder whether the knowledge is acquired in blocks of three or four parts which are cancelled once the students are "evaluated". The answer for this situation is *no*. It is clearly known that this process is highly pernicious for students, but it is currently being used in most educative systems worldwide. The abuse is done. Instead, new alternative systems are to be developed in order to make students protagonists of their own assessment and development. This alternative considers peers and professors.
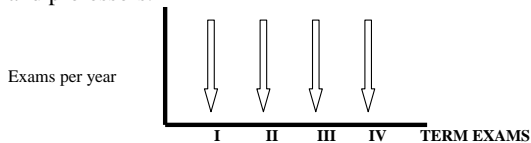

Figure 1. Model of Sagital Cutting Assessment

It is a pity to notice that many university systems follow the above Model, where the knowledge has a sagital cutting at different terms and final term exams. In this way, a sagital system is too hard to follow for it blocks the personal initiative, abilities, capacities, inventive and independence. The challenge to assume is related to reasoning and questioning, in order to reach a balanced validation and cognitive solidity. Now, universities are involved in *major knowledge*, and university professors assume the challenge to trial changes in the system of intellectual produce and assessment.

LEARNING ASSESSMENT BASED ON A GRADUAL IMPROVEMENT OF INTELLECTUAL PRODUCE

The proposal of developing an educative assessment based on a *gradual improvement* for the intellectual produce deals with the developing of diverse research tasks and works, which are improved gradually with the collaboration of the students, the research team and the professors. Then the involved people follow the process given in Table 1 (Logic Framework for Intellectual Produce) in order to get systematized results.

Initial assessment leads to a set of observations after the first presentation in advance of the intellectual produce by the research team, whose observations and questions must be answered; then a second presentation, with observations and answers, is also possible; and finally, the last presentation of the intellectual produce is in terms of searching high quality (Figure 2).

For example, a first presentation may deserve 30 per cent as an initial score and additionally a set of *observations* is given to the team, the second presentation will probably reach 70 per cent – that might be the minimum for a university. The professor motivates them to reach 100 per cent of the mind produce. In this process examinations are not recommended.
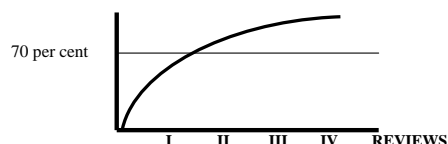

Fig. 2. Gradual Improvement Model for the Intellectual Produce

The advantages of using this model are diverse. First, intrinsic motivation is reinforced when the student knows to have the opportunity to better his intellectual work after each counseling session, in a way, results improve gradually and increasingly. Second, the student-researcher learn how to work with his peers in order to search amounts of qualified information to support his or her points of view, and an efficient manage of the variables under study. Third, each member of the team is conscious of his work and tries to do his best. Fourth, timing for the work is open and depends on the student the administration of it, he will soon discover that time is a worthy resource. Finally, the student knows that he is able to do complex works and that there is a possibility to be included in a scientific community because of the knowledge and abilities he possesses to explain the truth.

SUGGESTED METHODOLOGY FOR INTELLECTUAL PRODUCE

Organizing work in order to get the understanding of others is a nice task, depending on how clear your ideas are. In this way, a kind of organization is:

1. Planning the activity: 5W2H. Think about What, Who, Where, When, Why, How, How much.
2. Viewing the problems and alternatives. With the help of the Problems-tree, Objectives-tree (Inter-American Bank for Development, 1970)
3. Organizing the intellectual work in a logic framework. **Logic Framework for Intellectual Produce** (present work, above)
4. Formalization of results. Forms for Monograph, Thesis, Essay, Scientific Article, others.

CONCLUSION

The Logic Framework for Intellectual Produce is a useful mind tool for scientific research, especially for starting and organizing the tasks and results in science. Also, it lets us produce a platform of knowledge which can be presented in diverse form, according to the requirements.

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