Call from the South for a Transparent Higher Education (THE)
Part 1: Transparent Thinking Approach (TTA) Core Conceptual Framework

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The world sailed in the new millennium with a heavy burden of problems. This series of three articles is a call from the south to relieve these burdens by building a conceptual framework for a Transparent Thinking Approach (TTA). Part 1 covered Transparent Orientation (TO) and Transparent Solution (TS) evolution in preparation to present the core of TTA conceptual framework. Part 2 covers Transparent Presentation (TPr) tools in preparation to present the extended TTA conceptual framework (forthcoming, issue 15(6)). Part 3 covers the implementation of the Extended TTA in constructing a Transparent Higher Education (THE) with Math, Science and Engineering Education examples (forthcoming issue 15(7)).

TRANSPARENT ORIENTATION (TO)

Alarming Global Status: Challenges and Failures

Overburdened and Interconnected Globe

> *"The world has never been as divided as it is now, what with religious wars, genocides, a lack of respect for the planet, economic crisis, depression, poverty, with everyone wanting instant solutions to at least some of the world's problems or their own. And things only look bleaker as we head into future." (Coelho, P., Aleph , 2011).*

The world sailed in the new millennium with a heavy burden of problems that require immediate collective action. Global warming, wars and conflicts, terrorism, newly developed diseases (e.g. HIV, H1N1, H1N5, Ebola), population growth challenges, financial system problems, poverty, climate change and pollution are some of a long list of problems and challenges that the world need to tackle in the years, decades or centuries to come. Great challenges are facing humans in this century and the centuries to come, and an urgent need for immediate collective change, that produce a real development in all these domains, is needed (Shah, A. Global Issues websites).

The global status and circumstances, in this new century, lead us to believe that we are approaching an age of turbulence and instability. Problems, conflicts and challenges, that overburden humanity, are highly interrelated. As C. H. Waddington notes:

> *"we have ourselves faced by a series of problems- atomic war fare, the population explosion, the food problem, energy, natural resources, pollution and so on- each problem is complex enough in itself, but then it turns out that each of these is only one*

aspect of, as it were a total problem, in which all aspects of the world's workings are inter-related", (Laszlo, K. C. Dimensions of System Thinking)

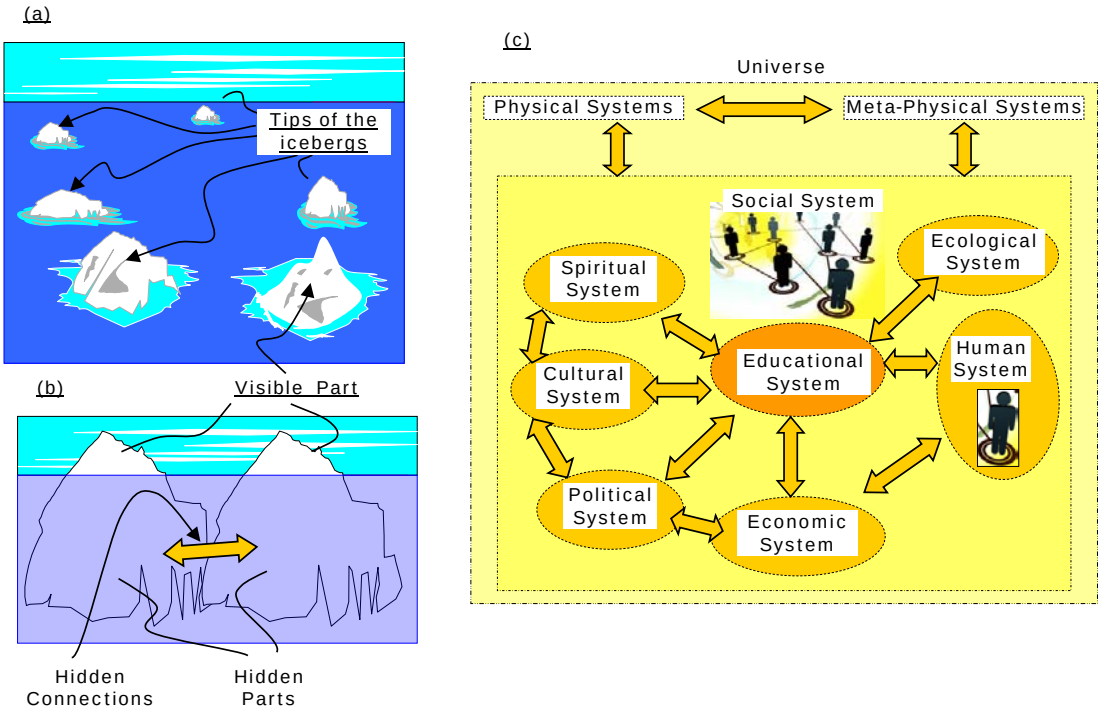
These alarming circumstances are urging us, as academicians, to dig deeply for the real causes of these overwhelming problems and to try to formulate and implement appropriate solutions. But the question that arises before delving deeply in analyzing these crucial situations is: What are hiding under all these icebergs that are protruding in every aspect of our life?

Looking Below the Tips of the Icebergs

"What's hurting the U.S. economy is total government spending. The deficit is an indicator that the government is spending so much money that it can't even get around to stealing all of the money that it wants to spend. But the tip of the iceberg is not what hit the Titanic - it was the 90 percent of the iceberg under water" (Norquist, G. BrainyQuote.com)

All the above mentioned crises symptoms are just the tips of the icebergs and the challenge is in discovering what are hiding below all these tips; and how these hidden icebergs bodies are connected together in order to help us finding solutions for these problems. This iceberg analogy is illustrated in FIGURE 1 (a) and (b). To help in visualizing the big picture, FIGURE 1 (c) illustrated how the universe is viewed as a group of nested and dynamically interacted systems. Education is at the core of these systems and it is directly affecting and gets affected by all the other systems, as illustrated in FIGURE 1 (c). Education system has a crucial role in affecting a genuine reform in all other systems.

FIGURE 1
THE ANALOGY BETWEEN ICEBERGS AND GLOBAL PROBLEMS IN DIFFERENT DOMAINS



a) A picture of a number of icebergs symbolizes different global problems protruding out of a hidden sea,
b) Cross section of a two adjacent icebergs in which the hidden parts, visible parts and hidden interconnections are illustrated,
c) Seeing the universe as nested systems that are intereacted together in a complex way

> *"The world is a complex, interconnected, finite, ecological-social-psychological economic system. We treat it as if it were not, as if it were devisable, separable, simple, and infinite. Our persistent, intractable, global problems arises directly from this mismatch" (Meadows, D. H. in Sterling, S., 2003, p40)*

Revealing the hidden parts, interconnectedness and interactive behavior of the systems (icebergs), will be essential in building an understanding that result in finding solutions to these overwhelming problems. Superficial, fragmented, and blinded analysis is plaguing our global development approach. A deep, meaningful, connected, and holistic thinking approach is in need to be formulated in order to deal with these highly connected and complicated challenges.

Contradicted Inputs and Outputs: More Effort and Less Development

> *"The volume of education has increased and continues to increase, yet so do pollution, exhaustion of resources, and the dangers of ecological catastrophe. If still more education is to save us, it has to be an education of different kind: and education that takes us into the depth of things." (Schumacher, E. F in Sterling, S., 2003, p29)*

Schumacher, E. F points (Sterling, S., 2003) out that one of the many contradictions that face humanity at the onset of the new millennium is that while the volume of education has increased and continues to expand, there is still a continual accumulation of local and global problems. Global economy is souring to worth trillions of dollars while poverty is spreading. Humanity achieved prosperity on one side of the world and there are millions of people still living with less than a dollar a day. Health care systems are immensely developed, but there are still millions of people who cannot get a health care. The world is expending billions of dollars in search for another life in the deep space but there are only limited resources to fund research to find a cure for diseases. Billions of dollars is spent on weapons but no enough money is allocated to health care and education. All these contradictions and paradoxes are created by humans and the key to resolve them is by developing a deeper way of thinking. Education as the most important incubator to enhance people thinking is needed to be changed. Different kind of education is needed that can produce people with the needed depth of thinking and who are able to generate new innovative ideas that can contribute to solve the current accumulated problems.

Call from the South for a Smart-Honest Relations

Dependent and Detrimental Development of Developing Countries

Analyzing the true situation of the developing countries is of a paramount importance before proposing any development reform. Raúl Prebisch (Scipes, K., 2008) argued that the relationship between developed and developing countries was exploitive. This perspective was further developed by Andre Gunder Frank, who introduced the concept of dependent development. Frank stressed the fact that development strategies promoted by the wealthy countries were designed to ensure that the "developing" countries remained in a subordinate position (Scipes, K., 2008).

While formal colonization has largely ended, either through the granting of independence or through wars of liberation, many formerly colonized countries have continued their earlier political-economic relationships with their former colonial master. Scipes, K. (2008) attributed this relationship to the following reasons: (1) Colonization involved structuring the economy of the colonized country to serve the needs of the colonizing country and its corporations, (2) old relationships of local administrators

trained during the colonial period have continued. This continuation of earlier colonial political-economic relations is generally referred to as neocolonialism. Neocolonial relationships have been encouraged by both the International Monetary Fund (IMF) and the World Bank. Both have promoted neoliberal development programs. This neoliberal economic model has resulted in what Kim Scipes's studies calls "detrimental development" (Scipes, K., 2008).

Distorted Way of Thinking Result in Ill-Structured Relation

The ill-structured relation, that has been established between developed and developing countries, is due to the huge divergence between the development statuses of the two groups of countries, as illustrated in FIGURE 2. The imbalance in the south-north relations and cooperation is deeply rooted in the way both sides look at each other. The relation is mostly based on blind imitation-intentional exploitation more than being based on win-win approach. Improving ways of cooperation between developing and developed countries lies in affecting a change in their distorted way of thinking that was developed over decades.

FIGURE 2
ILL-STRUCTURED RELATION BETWEEN DEVELOPED AND DEVELOPING COUNTRIES

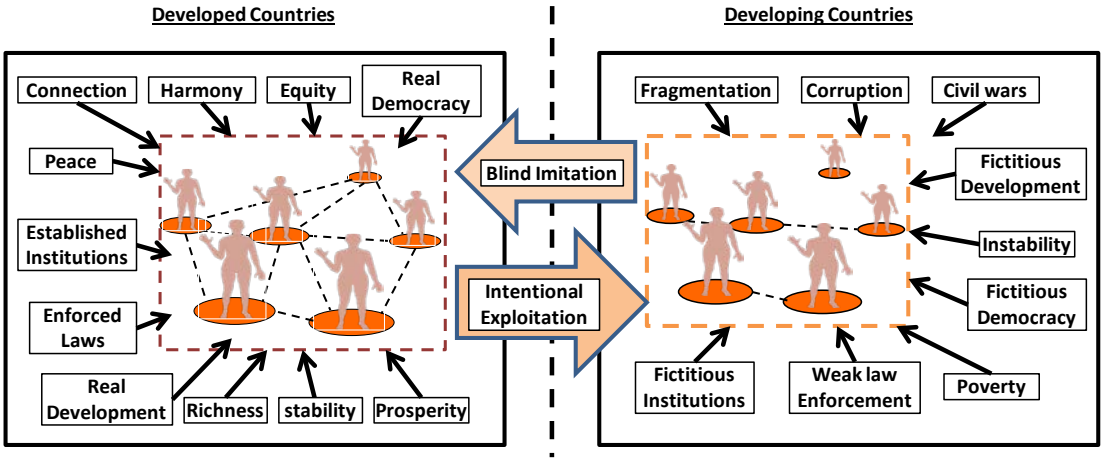
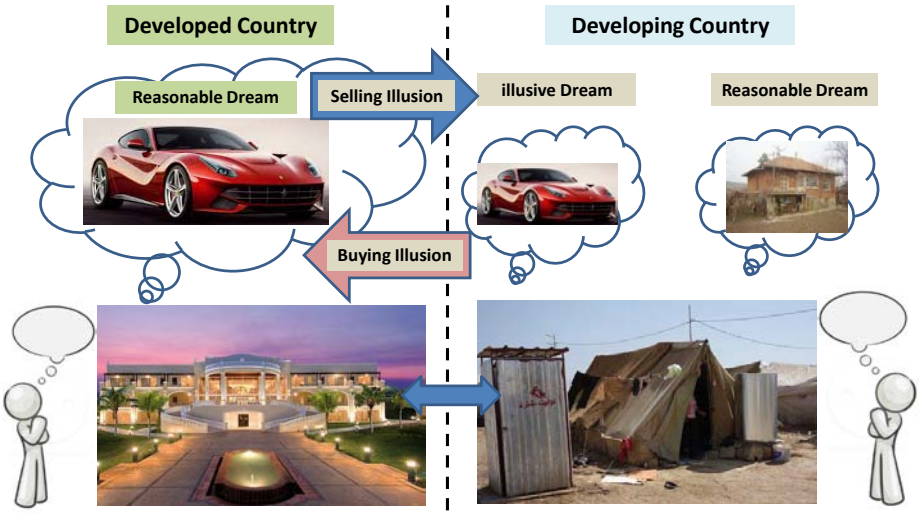


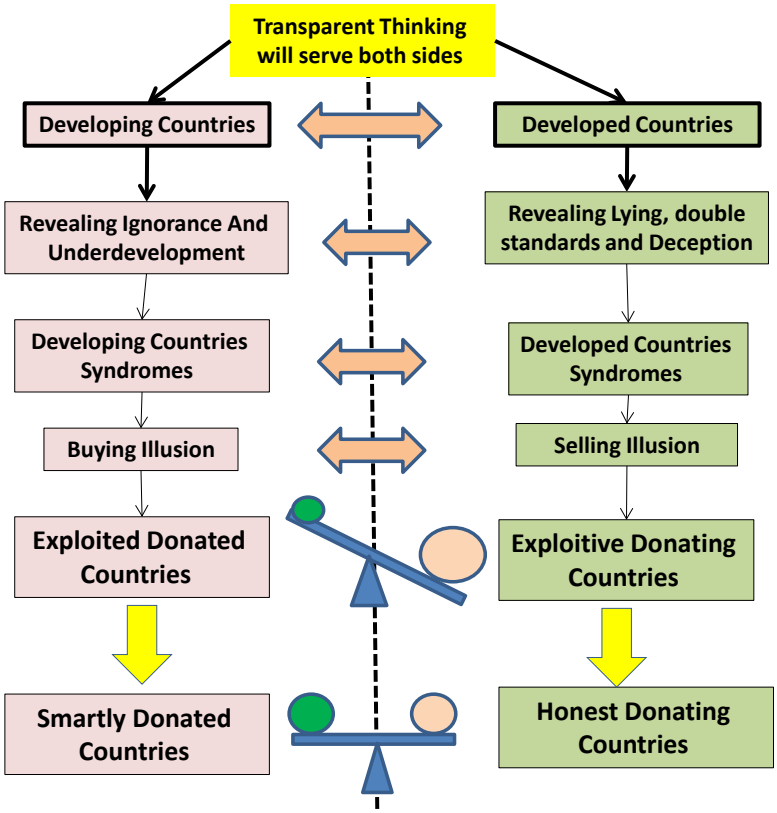
FIGURE 3
ILLUSION EXCHANGE BETWEEN DEVELOPED AND DEVELOPING COUNTRIES



Harsh and ironic analogy will be implemented to simply and deeply illustrate the developed-developing country relation in terms of rich and poor family dreams. As ironically depicted in FIGURE 3, the dream of owning luxury car for a rich family (developed country) is a reasonable dream, but it is an illusive one for a poor family (developing country). Ill-structured relation between developing and developed countries may result in the prosperity of illusion exchange business.

This analysis developing and developed relations shows an imbalance in the relation towards adopting exploitive practices, as illustrated in FIGURE 4. A new balanced and fruitful relation is required, which is formulated by an honest donating countries and smart donated countries.

FIGURE 4
CORRECTING THE IMBALANCE BY SHIFT FROM IMITATIVE-EXPLOITIVE RELATION TO NEW SMART-HONEST RELATIONS



Deeply Restructuring the University and Academicians Roles in Developing Countries

Most universities in developing countries are suffering many problems that leave them incompetent to accomplish their role as a major driving force for development and change in their societies. Outdated curricula, unmotivated faculty and students, poor management, unqualified administrations, limited funds, weak infrastructure and more are some of the many problems that face universities in developing countries (Juma, et al, 2005). Therefore, universities in developing countries should be deeply restructured in order to be able to play a leading and pioneering role in the local development and hopefully take part in solving global problems. This will necessitate university professors in developing countries to exert an extra amount of highly relevant research effort that is devoted towards achieving the crucial millennium development goals by playing an important role in their society's development effort.

In developed countries, an effective partnership is already established between the development fundamental partners, which are industry, academia, civil society and government (Yusuf, et al, 2007).

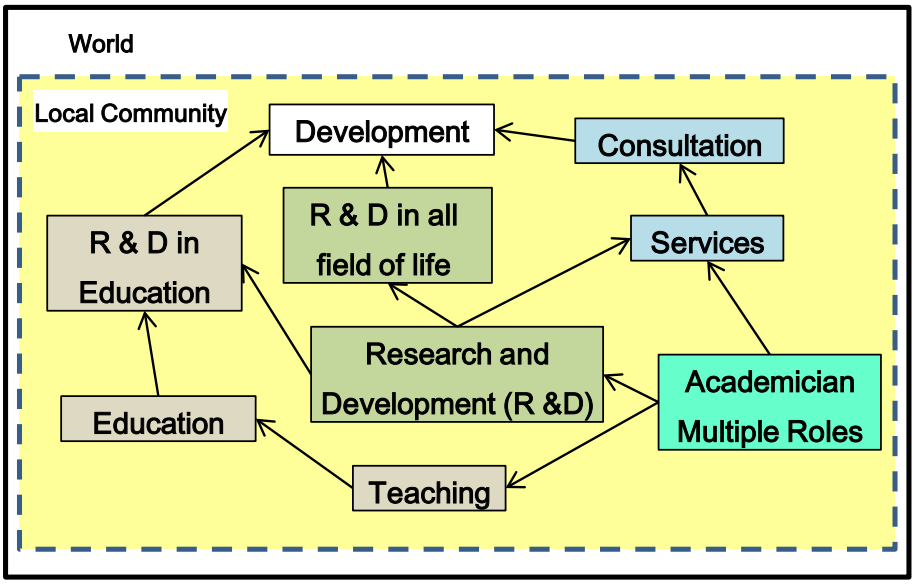
However, in developing countries, this kind of partnership is either not effective or not actually exist (Shane 2005, Peril, 2007).

Disorientation of Academic Research

Jordan (as a developing country) suffers a disorientation of academic research towards topics that serves the academic purposes (tenure track issues) more than filtering direct benefits to the local community. Research flux should be redirected towards research projects that solves real problems and filters real innovative ideas that can be easily commercialized to result in affecting a real development (SRTD II Grant Guidelines, 2014).

Academicians play multiple crucial rules in any community: (1) teaching, (2) research, and (3) community services, as illustrated in FIGURE 5. In the case of developed countries, academicians usually balance their efforts between research, teaching and community service. In developing countries, the local situations and requirements necessitate increasing the proportion of community service over that of the other two. It is painful when you see that the majority of Jordanian students are still taught in the same way as our generation (35 years ago) was taught in a superficial and regurgitated way. Then, an important question arises: Why there is no filtration of the research experience to practice? This question is one in a group of questions that motivate me to propose this vision for change.

FIGURE 5
THE MULTIPLE ROLES OF ACADEMICIAN



Functioning Intellectuals Are a Development Need

> *"The role of the intellectual is not to consolidate authority, but to understand, interpret, and question it…Indeed, the intellectual vocation essentially is somehow to alleviate human suffering and not to celebrate what in effect does not need celebrating, whether that's the state or the patria or any of these basically triumphalist agents in our society." (Said, E. On Defiance and Taking Positions)*

If there is one lesson that we can learn from the late scholar Edward Said, it is that the intellectual vocation is a moral one. Society itself must be selective in its choice of intellectuals. There should be a general awareness for the need and importance of having intellectuals that have the intention and the

capacity to develop their own societies. The failure to distinguish the appropriate types of intellectuals the society needs will result in an immoral ordering of society (Taib, M. I. M., 2003).

In a classic work written by the prominent Malay sociologist, Syed Alatas, he distinguished between two types of intellectuals: the non-functioning and the functioning intellectuals. The emergence of functioning intellectuals in society is vital for development and social change. By functioning intellectuals, he meant as those who are able to: (1) pose problems, (2) define the problems, (3) analyze the problems, and (4) suggest solutions for the problems. In addition, the concept of 'functioning' intellectuals can be further described by contrasting them with the non-intellectual (Taib, M. I. M., 2003):

> *"A non-intellectual, though educated, is passive mentally. He accepts what is taught to him uncritically. He does not exert himself thinking about different problems over a span of years. He is not emotionally committed to the intellectual pursuit. He does not miss an intellectual discussion because he feels no need for it. He does not spend time reading on serious subjects. He is not capable of forming an opinion beyond what is obvious to most people. If he is a specialist, his knowledge of subjects outside his field is comparable to that of the layman." (Syed Alatas in Taib, M. I. M., 2003)*

Alatas did acknowledge that there are intellectuals who gave bad diagnoses of a perceived problem. Such intellectuals are to be considered as nonfunctioning, or at the very least, badly-functioning intellectuals. Syed Alatas expressed his concern that the emergence of a functioning intellectual group should be considered as a development need. It is a vital condition for nation-building (Taib, M. I. M., 2003).

Thinking Is the Core of the Core

> *"We can't solve problems by using the same kind of thinking we used when we created them." Albert Einstein*

Our global and local problems are inherently a result of our current way of thinking. A way of thinking that divides humanity into a few rich and a majority of poor; a few developed and a majority of undeveloped; a few independent and a majority of dependent. In spite of the fast accumulation of knowledge, technologies and innovations, humanity still direct all these resources towards the wrong areas. Humanity is in need for new way of thinking in order to be able to overcome these huge challenges.

Humanity realizes more than ever that our individual and collective world views are the causes of our existing problems and also the key in resolving them, as Sterling, S., wrote

> *"I am motivated by a deep concern for the state of the world and the planet, and by the belief that it is our individual and collective worldview that is the key both to crisis and resolution" (Sterling, S., 2003, p24)*

The most important challenge that faces humanity at this stage of its existence is to develop a higher consciousness level (new way of thinking) than the one created these burdens. Einstein wrote

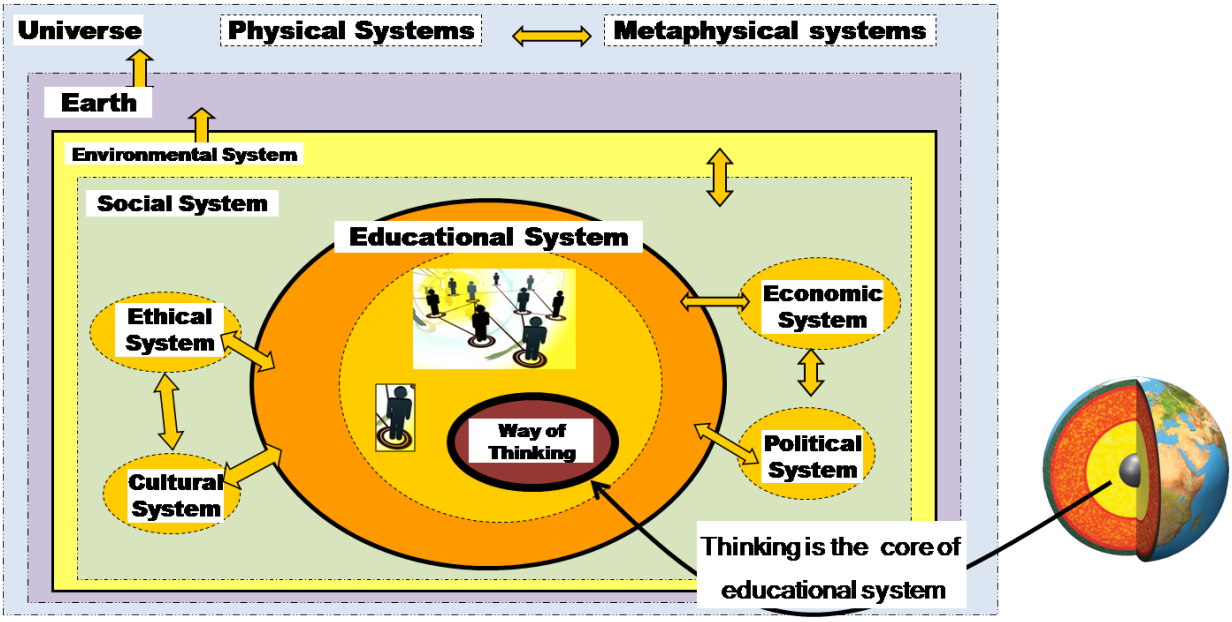
> *"No problem can be solved from the same consciousness that created it, we have to learn to see the world anew" (Sterling, S., 2003, p28)*

New and multiple level of consciousness is also needed that are higher than the ones which create the problem. There is a crucial need for totally new way of looking at everything around us, starting from ourselves and zooming out to encompass the whole universe or zooming down to see the details of the micro universe. Einstein wrote

> *"that we need to be able to see 'with new eyes' to move beyond the problems the prevailing consciousness has created and this applies at both micro and macro levels" (Einstein quote in Sterling, S., 2003, p25)*

New way of thinking is needed in all aspects of life: political, environmental, financial, educational, and economic sectors. This new way of thinking should affect how we perceive our universe, communities, families structures and practices till it goes down to the individual structure and how he/she define himself/herself with respect to the universe, other humans and all creatures. As illustrated in FIGURE 6, the new way of thinking occupy the core of our global development effort. It is the starting ignition sparkle for any genuine change.

FIGURE 6
THE NEW WAY OF THINKING IS AT THE CORE OF EDUCATION, WHICH IS AT THE CORE OF DEVELOPMENT



Opportunity to Restore the Continuum

Humans are living in the age of specializations (unlimited reductionism) and it works for developed countries in creating the short term prosperity, but on the same time failed to sustain our existence on this globe (Scaruffi, P., 2008). The fragmentations of knowledge in countless disciplines is widening and results in spinning in an endless loops specializations that decoupled science and art. The Decoupling of art and science results in a drought in innovative ideas that can offer the needed solution for our overburdened globe. Because the western mind is blinded by bureaucracy, stereotypes, habits and prejudice, Scaruffi, P., (2008), called the developing countries to lead the initiative for a fundamental transformation in the society of specializations. Scaruffi, P., (2008), is warning the developing countries not to replicate the western mind that is trapped in the endless loop of reductionism. Developing countries are needed to seize the opportunity to restore the continuum by integrating science and art as an initial step in starting a multidisciplinary coupling movement that fruits innovation and creativity. Developed countries can take the share in setting up the infrastructure for the interdisciplinary paradigm shift in thinking (Scaruffi, P., 2008).

Developing the Ability to Maneuver Between Reductionism and Holism

In response to this "extremism" in reductionist thinking, groups of scholars responded by a drift to holistic thinking side in a trial to see the big picture and to find solutions for our global problems. Being trapped at the reductionist scale is not solved by being blinded by holistic thinking. This set of articles

(Parts 1-3) is offering the answer to this dilemma by developing a new thinking approach that enable the thinker to maneuver between scales, disciplines, fields, perspectives, and contexts.

Seeking a Generic Conceptual Framework of Thinking

Changing the way we think does not automatically contribute in the solution of various problems, challenges, crises we face, but creating a new thinking framework will help in formulating a new perspective for these problems and in visioning a prospective solution (Carbera, D., 2008). Due to its "allure", (as Carbera, D., 2008 liked to express) Systems thinking is an approach of thinking that quickly diffused in numerous scientific fields and popular culture (Carbera, D., 2008). In spite of being conceptual in nature, Systems thinking suffers some ambiguity and amorphousness. Carbera, D., (2008) tried to build a conceptual framework for system thinking by revealing a generic universal conceptual patterns that can be applied to great practical contexts. Carbera, D. et al., (2008) revealed four component rules or patterns which are Distinctions, Systems, Relationships, Perspectives (DSRP). DSRP theory of system thinking provides the mechanism for a view of systems as dynamic, patterned, evolving, adaptive, and complex entities. Discovering these four patterns is a trial to go into micro scale thinking to reveal more hidden patterns or components (Carbera, D., 2008).

Thinking is one of the most complex processes that characterized humans. Thinking is of great relevance in terms of helping humans to cope with more and more complex challenges of the world. In a trial to formulate a unified conceptual model of this fascinating process, Glatzeder, Goel and von Muller in their edited book "Towards a Thinking Theory" paved the road for the long term goal of formulating a generic framework for thinking (future thinking theory) (Glatzeder, et al, 2010).

Learning is the first domain that directly benefited from developing a new thinking framework. Mosely, et al. (2005) edited a unique, interdisciplinary, comprehensive handbook entitled "Framework for thinking" in which a 42 frameworks for thinking are classified, described, and evaluated. The discussed framework was classified into four groups that deal with: (1) Instructional design, (2) Productive thinking, (3) Cognitive structure or development, and (4) multiple outcomes. Constructing an integrated framework is one of the main ongoing themes that the handbook pushes towards (Mosely, et al., 2005).

This series of articles is presenting a new generic thinking conceptual framework that is based on transparency as an instrumental value. This new thinking approach succeeded in extension and expansion to accommodate a wide spectrum of other instrumental values and its corresponding thinking skills. The journey of introducing this new thinking approach will be initiated by introducing the following road map.

Unique Presentation for a Unique Thinking Approach

Most articles written in academic journals are either written in reductionist way by being blinded from seeing or being connected to the big picture, or written in a holistic way that are also blinded from seeing the small scale picture. The new thinking approach presented in this set of articles has features that enable maneuvering between small and big picture perspective. Before being "shocked", the readers deserve to be oriented to the main presentation's features employed by this new approach before delving in discussing the whole story:

1. The way of Writing is considered a living example of the new thinking approach
2. Implementation of zooming ability to the needed picture scale either small or big based on contextual requirement.
3. Implementing the belief that simplicity is the essence of depth which is reflected on language, graphics, analogy, and metaphor used in writing this set of articles.
4. Applying the belief that complexity and simplicity is relative and that simple things were previously complex before being simplified by analysis and thorough understanding.
5. Transparency is used as an overarching instrumental core value that is expanded to encompass a number of other core values like, holism, meaningfulness, clarity, connectedness, relevance, usefulness, depth, utility, and visibility.

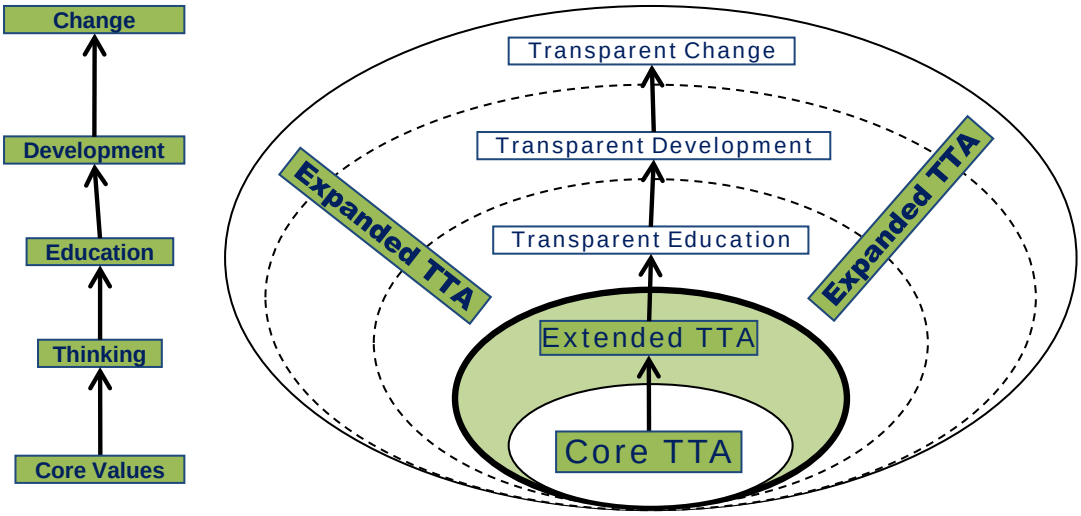
6. Visible modeling (graphics, analogy, metaphor) will be implemented as a tool help in conveying the depth of concepts.
7. Drawing a road map for the whole journey is essential guiding tool for the reader

Road Map of a Carefully Planned Journey

This article is telling the whole story for the evolution of Transparent Higher Education (THE) within a framework of a Transparent Thinking Approach (TTA). TTA is evolved under the pressure of urgent global challenges and problems and as a result of a long struggle (seeded 27 years ago) and daunting effort for personal and an educational system's change. This article is written in a way to take the reader in a journey through the universe and to spot the light on and implement the basic and simple facts that are not given much of our attention. These simple and deep facts are essential in building a new coherent structure of our understanding of the whole universe as an essential step for building Transparent Higher Education (THE). It is a carefully planned journey that passes smoothly between numerous stations till it gets to the required destination.

At the onset of the journey, it is appropriate to briefly describe the journey's road map. TTA will be presented in three stages: (1) Core TTA, (2) extended TTA, and (3) Expanded TTA, as illustrated in FIGURE 7. Each stage will be covered by a separate article. This article is the first in a three parts that will cover the whole story.

FIGURE 7
THE CORE TTA CONCEPTUAL FRAMEWORK IS FORMULATED THE EXTENDED IN VALUE DOMAIN AND EXPANDED IN EDUCATIONAL, DEVELOPMENT AND CHANGE DOMAINS



Detailed TTA road map is illustrated in the form of a conceptual graphical model that outlines the main stages and steps of development of this new thinking framework (FIGURE 8). The journey is divided into 9 steps: (1) Transparent Orientation (TO), (2) Evolution of Transparent Solution (TS), (3) Core TTA, (4) Transparent Presentation (TP), (5) Transparent Perspective (TP), (6) Extended TTA, (7) Expanded TTA, (8) Application of Expanded TTA in the form of Transparent Higher Education (THE), and (9) Transparent Conclusion (TC), as illustrated in FIGURE 8. Each three steps will be considered a stage and will be covered in a separate article (FIGURE 8).

The following are a brief description of each step:

1. Transparent Orientation (TO): This stage will cover the following topics:

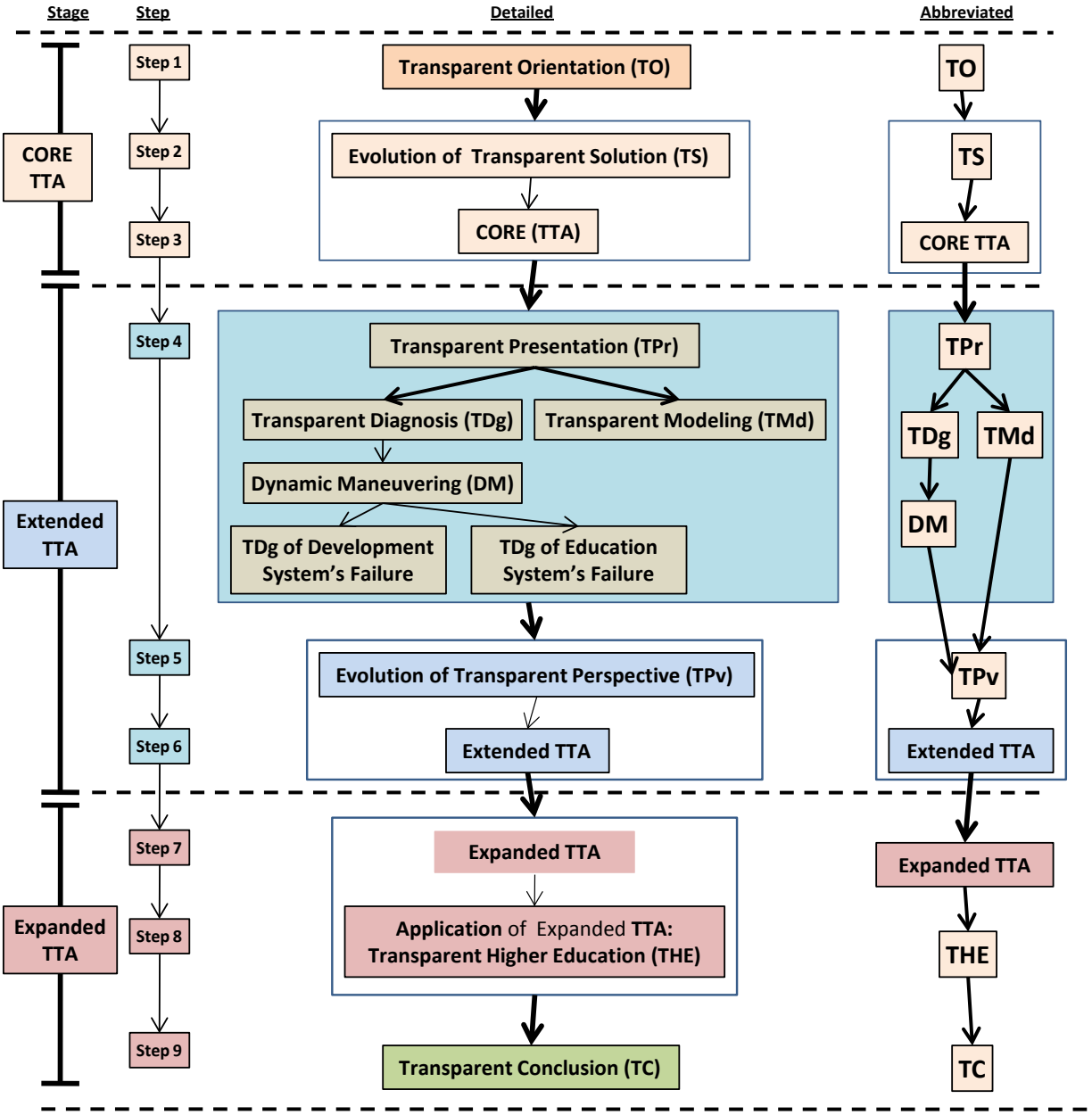
a. Global challenges and failures is briefly visited to give the reader a glimpse of the global problems that motivates proposing a shift towards new thinking approach that has a higher level of consciousness.
b. Call from the south is sent to the international academic community for formulating new cooperation relations.
c. Developing new thinking approach is found to be the core of solution
d. Graphical conceptual road map is implemented to show the whole journey stages and a brief description of each stage covered concepts will be offered.

2. Transparent Solution (TS): The seeding of TTA was early in the form of followings pointers and connecting fragmented pieces. Transparency plays the role of an overarching instrumental core value that most other values emanate from. Transparency started to de diffused to educational domain. A need is highlighted to get transparency to micro scale level (thinking level)
3. Core TTA :
   a. Understanding how transparency evolved from a core instrumental value to be an overarching theme that can accommodate all process of change that we undergo in all aspects of our life.
   b. The core generic conceptual framework of TTA is presented and applied to most strands of our life.
   c. Transparent Thinking Approach (TTA) is a new and a genuine framework of thinking that can be easily expanded to all global and local sectors of development.
   d. Transparization is coined to work as the central thinking perspective that will be used to reveal the hidden structure, behavior and meaning of the all entities in the nested systems of this universe.
4. Transparent Presentation (TPr): TPr will play an important role in employing two important tools for presenting TTA. The two tools are Transparent Diagnosis (TDg) and Transparent Modeling (TMd)
   a. Transparent Diagnosis (TDg): TDg is the first tool developed under TTA umbrella. The most important tool that is developed under TDg umbrella is Dynamic Maneuvering (DM). DM is a tool that be used to maneuver between; (1) Holism and Reductionism, (2) analysis and synthesis, (3) simplicity and complexity, (4) scales, (5) domains, (6) meanings, (7) contextualization and decontextualization, and (8) theories, paradigms, perspectives, and values.
   b. Transparent Modeling (TMd): TMd is the second important tool that is developed under TTA big umbrella. TMd tool is characterized by (1) graphic and animation enrichment, (2) Employing deep, harsh and multi-domain analogy, (3) Employing purposed joke, (4) real life contextualization, (5) Story telling Enrichment, (6) Real and virtual activity, (7) Real and virtual field trip. These features of TDg will be practiced all over the three articles.
5. Transparent Perspective (TP): While looking to the universe using TTA core construct, a Transparent Perspective (TP) is developed at this point to enable transparency instrumental core value to encompass two other main core instrumental values (Holism and Meaningfulness). This result in developing two main transparent sub thinking tools (Transparent Holistic Thinking (THT) and Transparent Meaningful Thinking (TMT)).
6. Extended TTA:
   a. TTA full conceptual framework is presented to encompass 42 types of thinking.
   b. Transparency when expanded to system thinking domain, it results in developing a Transparent Holistic Thinking (THT). THT enables us to transparize systems' structure (content and connectedness) and behavior (static and dynamic).
   c. Transparency when expanded to meaningful thinking domain, it will result in developing a Transparent Meaningful Thinking (TMT).
   d. TMT enables us to transparize meaning that lies behind system structure and behavior.
7. Expanded TTA: The diffusion of transparency as instrumental core value goes deep to reach the core of all change which is learning. TAA conceptual framework is expanded to educational,

development and change domains domain. TTA will be used as a seed crystal that will be implemented to crystallize a new perspective for life in all its domains.

8. TTA Application (Transparent Higher Education (THE)): Applying TTA to the educational domain is the main objective that is sought and the product will be called Transparent Higher Education (THE). Few examples are covered in the Domains of Math, Science and Engineering Education.
9. Transparent Conclusion (TC): Concise summary of the whole TTA development that ended in its application in the form of Transparent Higher Education (THE).

FIGURE 8
ROAD MAP OF TRANSPARENT HIGHER EDUCATION (THE)



EVOLUTION OF TRANSPARENT SOLUTION (TS)

Early Seeding of a New Transparent Thinking Approach

> *"Everyone thinks of changing the world, but no one thinks of changing himself." (Leo Tolstoy, Brainy Quote.com)*

Sparkles That Ignite the Need for Educational Reform

An old and deep desire for educational reform evolved as a result of realization of existence of serious problems in Jordanian Educational System that spans both k-12 and higher education. A deep state of unsatisfaction with the existing Jordanian educational system was seeded during my high school study (27 years ago). This feeling started to germinate in the form of random thoughts or comments uttered in classes to my teachers who mostly responded with resentment. In spite of this hard atmosphere, I had a dream that these stagnated, regurgitated and rote educational methods are going to be vanished as soon as I enrolled in university study, but the truth was shocking. This shock is due to the unexpected stagnated situations of Jordanian higher education that makes me convinced that educational reform is in need to be started.

Transparency Seeded by Big Picture Perspective

Being deeply unsatisfied ignited in my heart the desire to search for an appropriate educational reform by picking up hints and following pointers in literature and practice. This desire started to be formulated during my sophomore year when I took an introductory physics course (Physics 101, Fall 1987). Hudson and Nelson "University Physics" (1982) book was the textbook used in this course. Hudson and Nelson book deeply affected my educational reform perspective. The authors, in their book, sparingly wrote about their pedagogical perspective in the form of one page introduction for each section of the book which entitled "perspective". These one page perspectives aim at giving the student a glimpse of the importance of acquiring the big picture of the subject in order to develop problem solving ability. These one page perspectives strikes a chord in my consciousness to go deeper in the educational literature seeking a solution for the problems of the Jordanian educational system that looks naive and needs urgent reform.

Hudson and Nelson (1982) in their introductory physics book stressed the importance of seeing the big picture by writing:

> *"Sometimes it is easy to become overwhelmed by the many trees in the forest and fail to see the structure of the subject as a whole, in particular, central ideas that unify and simplify the subject. It will be helpful in our progress to occasionally stand back from the subject and emphasize these important ideas."*
> *Hudson and Nelson, University Physics (1982)*

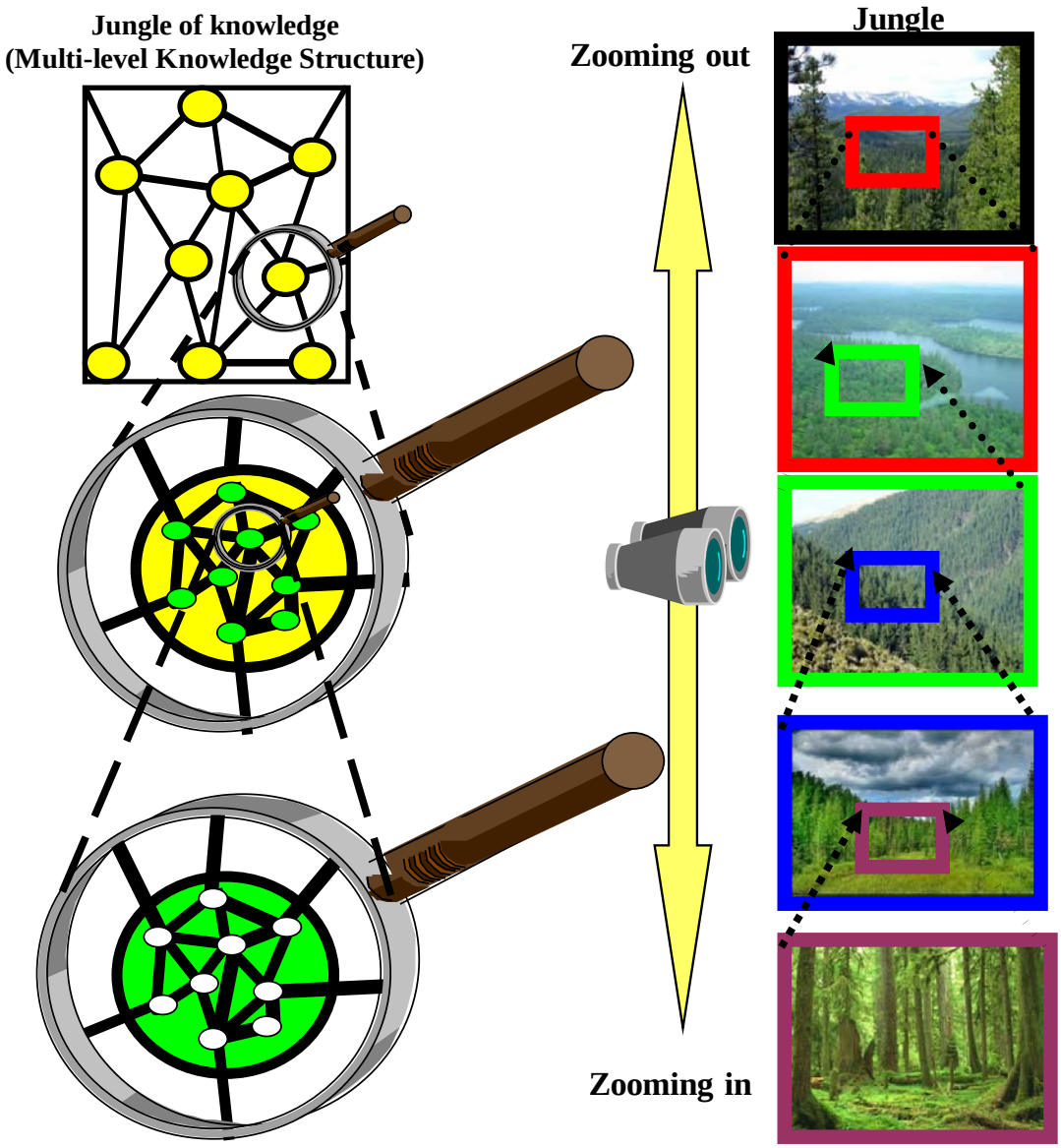
This quote illuminates the importance of seeing the structure of the subject in the form of central ideas used to unify it. Hudson and Nelson (1982) also connected the ability to see the big picture with the ability to solve problems in physics. They stressed that the student can analyze a wide variety of phenomena in terms of just few powerful concepts. They wrote

> *"Keep your eye on these important themes, which appear again and again as we discuss variety of topics. Learn to spot the clues in a physical situation that tip you off as to which method may be the most effective- it will greatly simplify the solving of problems. This is the physicist approach: analyzing a wide variety of phenomena in terms of just few powerful concepts." (Hudson and Nelson, University Physics,1982)*

Hudson and Nelson also used the analogy of seeing trees in the forest as an essential strategy while exploring the "jungle of physics knowledge". FIGURE 9 is drawn to help the reader visualize this important analogy. This jungle-knowledge analogy is graphically illustrated in FIGURE 9 to clarify the

relation between using the binocular to zoom in and out of a jungle and to cognitively zooming to see the details of physics knowledge. These one page perspectives clearly indicate that the Hudson and Nelson see the domain of physics as a landscape full of different geographical features, and they recommend the students to fly over the topics and try to visualize it in order to assimilate the structure of the subject in their minds.

FIGURE 9
SCIENTISTS ARE IN NEED FOR HAVING THE ZOOMING IN AND OUT ABILITY TO SEE THE BIG PICTURE AND ALSO THE SMALL PICTURE IN THE JUNGLE OF KNOWLEDGE



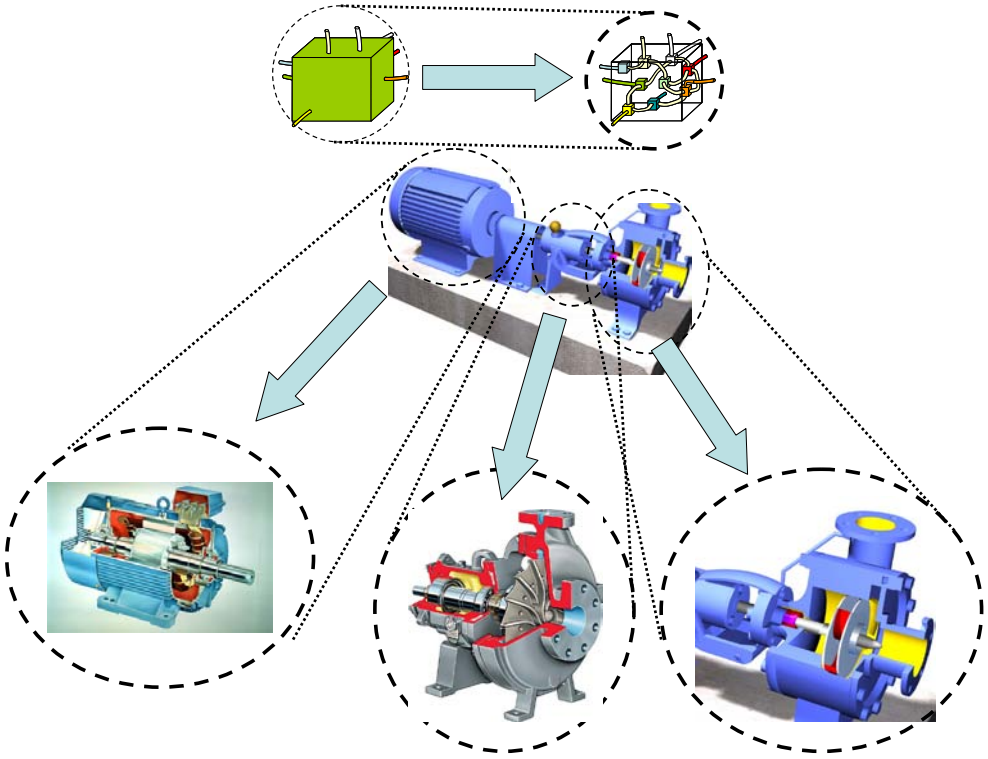
Hudson and Nelson perspective of looking at physics and ultimately at all sciences greatly ignited in my heart the desire to seek a reform in the educational system based on this big picture or whole system perspective. It was just the starting point of a journey in the terrains of knowledge. This journey aims to build the knowledge map of the subject in order to enable the learner to easily undertake the adventures in

these terrains. Visualizing the details of the terrains of knowledge requires a transparent perspective to see the unifying core concepts and to structure them into a coherent whole, as illustrated in FIGURE 9.

Transparency Seeded by Seeing What Is Inside the Black Box?

Godiwalla, S. (1998) (she was a chemical engineering student) published a short article that entitled "What is inside that black box?" Godiwalla, S. (1998) described the experience she gained from internship in one of the industrial companies. Godiwalla explained how her eagerness to get insight about the real job of a chemical engineer and her desire to make connections with real chemical process equipments helped her in gaining fruitful industrial experience. At that time, this article was a fortune for me (Freshman Chemical Engineering Student), because I felt that Godiwalla wrote about my experience as a chemical engineering student who suffers from missing relevancy of educational system practices by ignoring the hand-on components of chemical engineering education. Learning about a pump, heat exchanger, or reactor as a black box without revealing its internal details is considered for the student as a shortcoming that should be corrected, as illustrated in FIGURE 10. Revealing what is hidden inside process equipments is another motive that guides me in my struggle for a different educational approach. FIGURE 10 shows how the desire of engineering student to reveal the hidden internals of a process pump (motor, coupling and gear box, and pumping head) is an act of making these black boxes transparent. Godiwalla article helps in seeding the struggle towards developing my Transparent Thinking Approach (TTA).

FIGURE 10
REVEALING THE INTERNALS OF A PROCESS PUMP AND UNDERSTANDING HOW IT WORKS IS SIMILAR TO UNCOVERING WHAT INSIDE A BLACK BOX

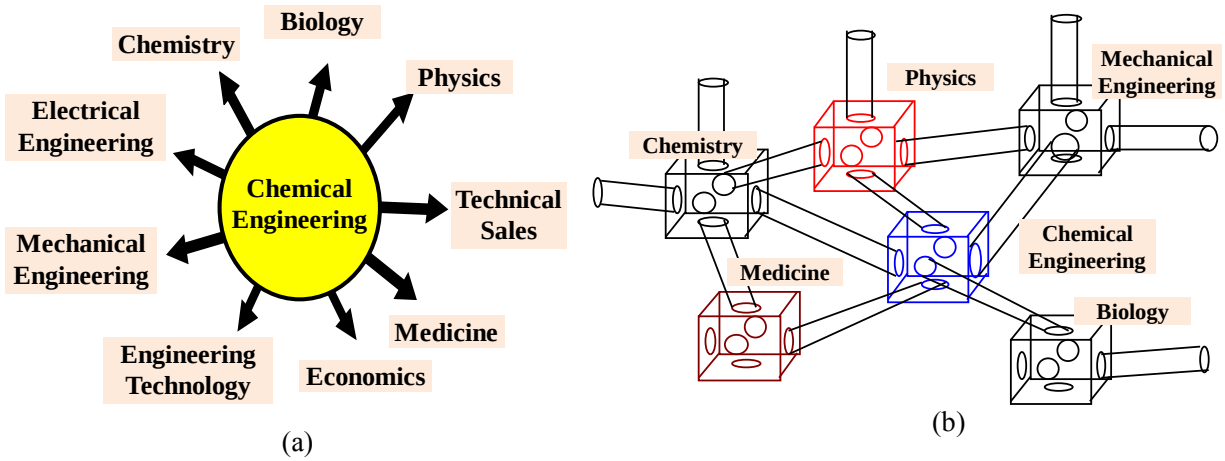


Transparency Seeded by building Chemical Engineering Knowledge Structure

Chemical Process Industries (CPI) employ, in addition to chemical engineers, a number of trained specialists such as chemists, physicists, mechanical engineers, electrical engineers, engineering

technologists, or economists. As illustrated in FIGURE 11, Chemical Engineers play a median role between all specialists working in CPI. To accomplish their median job, chemical engineers should be able to utilize their knowledge structure in order to be able to create chemical engineering framework and then to be able to expand to other disciplines.

FIGURE 11
THE MEDIAN POSITION OF CHEMICAL ENGINEERING KNOWLEDGE STRUCTURE



(a) 2-d representation
(b) 3-d representation (caves metaphor)

The undergraduate education committee of the AIChE sponsored a session on Knowledge Structure at Los Angeles Meeting in 1991. At the session, Rich Felder, John O'Connell, Scott Fogler and other Chemical Engineering education scholars shared their views of building the knowledge structures for a number of chemical engineering topics. Donald Wood and Rebecca Sawchuck wrote about the knowledge structure of the fundamentals of chemical engineering and fully clarified how these structures can facilitate learning and problem solving (Wood, et al, 1993).

The desire to build a knowledge structure for Chemical Engineering was my big dream in my long road of devising a new educational reform approach. The desire to see the big picture of chemical engineering knowledge structure greatly helped in seeding the effort to propose an appropriate transparent educational reform.

Approaching the Age of Transparency

> *"……, transparency is now the daily bread of everyday life, an issue for both the average citizen and the high-flying Wall Street stock analyst. Today, being transparent is "table stakes" for politicians around the world or between a boss and an employee in a two-person company" (Oliver, R. W. "What is Transparency, p 4, 2004)*

In the last forty years, transparency has risen to the top of public agenda in all domains of life in this world. Most of the current political, social, cultural and economical debates are rarely missing a discussion of the urgent need for implementing transparency as a core value. Transparency is the buzz word that most news bulletins, magazines, companies' websites, academic articles are crowded with. Transparency is needed to combat dishonesty, corruption, manipulation, cheating, deception, civil wars, financial crisis, misinformation, and fraud that are plaguing the world in 21st century. Humanity passed a

long history through agrarian age, industrial age, and the current biotechnology or information age and we are moving towards a new transparency age (Oliver, R. W., 2004). This new age is needed to be evolved to help in solving the problems that past generations is accumulating over this long history and especially in the last two centuries. The main feature of the evolving transparency age is the development of transparent way of thinking that has a higher level of consciousness than the one which created the current accumulated problems.

In 21st century, transparency is considered as one of the core values that formulates the practices, policies, and activities of governments, institutions, communities, companies, organizations, and NGO's. Transparency is adopted as a major reform component and a fundamental requirement in building economic, political and cultural and religious systems (Oliver, R. W., 2004). Oliver in his book "What is transparency" warns from being drifted in the opacity spiral and recommends fighting opacity by vicious cycle of public exposure (Oliver, R. W., 2004). Stakeholders (employees, unions, public, governments, civic, cultural, ethnic/racial, religious groups, etc...) are demanding a higher level of transparency (Oliver, R. W., 2004). Stakeholders are looking for a transparency that can be filtered down to the grass root level of development. A favorable atmosphere for creating a new level of consciousness in all domains is needed to combat corruption and to encourage the global community to adopt transparency as a main core value.

Transparency: Top Down or Bottom Up

> *"No organization in the world can claim victory when it comes to transparency. Like safety and quality programs, transparency is a journey, not a destination. Transparency requires constant refinements in response to new market requirements and increasing organizational competencies" (Oliver, R. W. "What is Transparency", p 33)*

Oliver, R. specified four key elements that are required to build a truly transparent organization (Oliver, R. W., 2004):

1. A culture dedicated to openness and a commitment to transparency at all levels of leadership.
2. Programs and processes that encourage and ensure openness, and punishment for opacity and fraud at every level.
3. Well-trained workers, managers, and administrators at all levels of the organization with the wisdom, integrity, confidence, and security to do and say what is right.
4. Established means of communication to the organization's important stakeholders.

The above key elements that are required to build a transparent organization can be generically applied to any other system. These four elements of change are covering all organizational levels. Transparency should be implemented in all directions (bottom-up, top-bottom, right-left or left-right). Transparency should concern top officials as it concerns shareholders and stakeholders. Building a transparent organization is a continuous improvement process in which all share and all get affected by its change.

Varieties of Transparency

David Heald (2006b) identified four directions of transparency:

1. Transparency upward when hierarchical superior/principal 'ruler' can observe the conduct and behavior of hierarchical subordinate/agent 'ruled'
2. Transparency downward when 'ruled' can observe the conduct and behavior of the 'ruler'
3. Transparency outward when the hierarchical subordinate/agent 'inside' can observe the conduct and behavior that is happening 'outside' the organization
4. Transparency inward when those 'outside' can observe the conduct and behavior that is happening 'inside' the organization,

These four directions of transparency are graphically illustrated in FIGURE 12. All these four directions of transparency are required at different proportions depending on the nature of the system that is needed to be transparized (transformed to be transparent). Transparency should be freely implemented in all directions and levels of organization hierarchy.

Transparency as an Instrumental Value

Heald, D. (2006a) also stressed that transparency should be mainly considered as an instrumental value and marginally as an intrinsic value. The instrumental role of transparency will enable it to be as a seed crystal that attracts other core values which overarch our life in all domains. Heald, D. (2006a) examined the relationship between transparency and seven related values (effectiveness, trust, accountability, autonomy and control, confidentiality and privacy, fairness, and legitimacy). Heald, D., (2006a) outlined two different views that might be taken concerning the relationship between transparency and these seven values. The first view is to look at transparency as an intrinsic value that underpins all the other seven values, namely assuming that transparency is not making any negative contribution to each of these other values, as shown in FIGURE 13 (a). Second view is to look at transparency as an instrumental value that interact positively and negatively with the other seven values in a form of hierarchy (Heald, D., 2006a), as illustrated in FIGURE 13 (b).

FIGURE 12
THE FOUR DIRECTIONS OF TRANSPARENCY

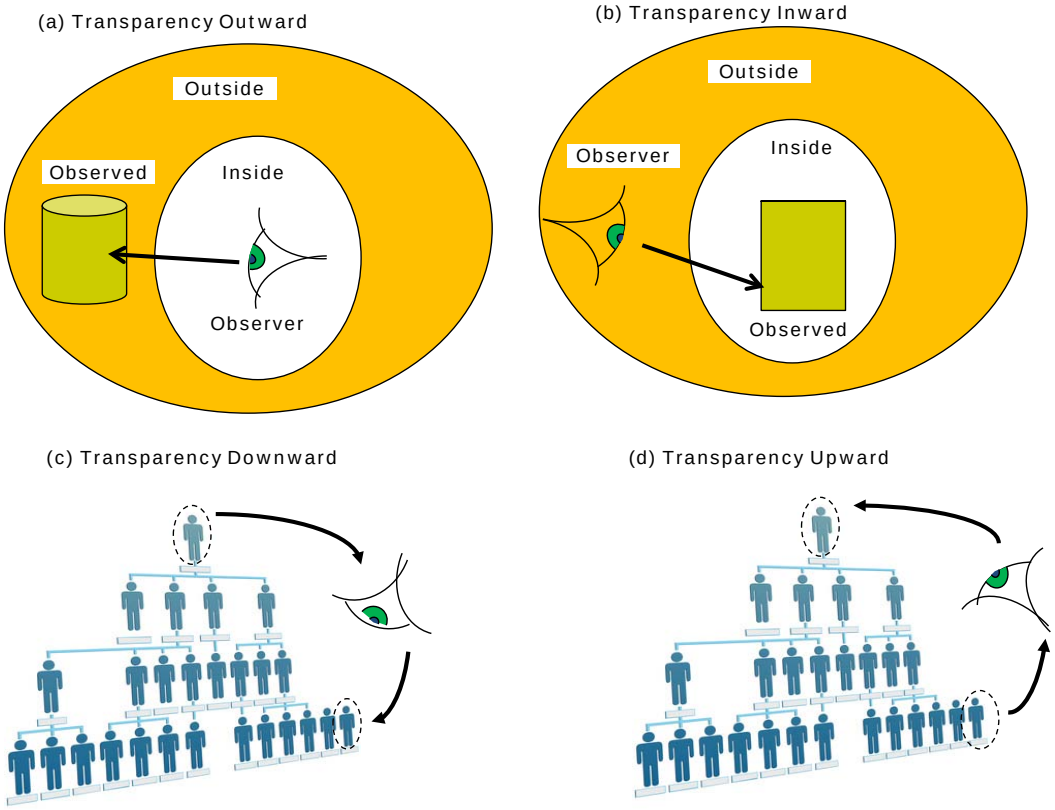
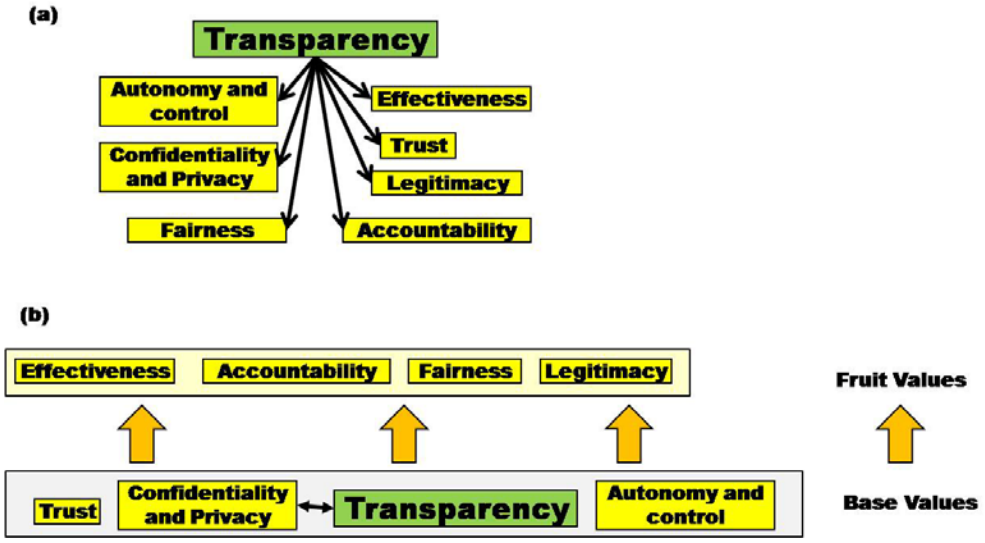


FIGURE 13



(a) transparency as intrinsic value
(b) transparency as instrumental value

Looking For Optimum Dose of Transparency

"Sunlight is . . . the best of disinfectants." (*Supreme Court Justice Louis Brandeis)*

The availability of various forms of transparency and the complex nature of its instrumental relationships with other core values (seven of them mentioned above), make it difficult to construct a clear conceptual framework of transparency as a central core value. The above sunlight metaphor is a very simplified picture of the real complexity of transparency conceptual framework. The question about the harmful effect of sun overexposure is raising an important question about the optimal dose of transparency that is needed to optimize the behavior of an organization. David Heald presented the following remarks as a general understanding for the existence of an optimal dose of transparency that is needed for a certain system (Heald, D. 2006b):

1. It is useful to conceptualize transparency as a set of contested relationships with other objects that may have an intrinsic or instrumental value
2. Because of non-linearities, these contested relationships work sometimes as trade-offs (one must be sacrificed to gain more of the other) and sometimes as synergies (more can be gained of each).
3. At very low level of transparency, more transparency is likely to be beneficial.
4. The trade-offs are mostly to be apparent when transparency is already high. In this case, variety and direction of transparency in addition to its amount will strongly interact to influence the relationship between benefits and costs.

This initial conceptual understanding is a good start to study more deeply and to present a more elaborated understanding for the optimization of the impact of transparency value.

Diffusion of Transparency in Education Domain

Transparent Learning and Teaching

Illinois Initiative on Transparency in Teaching and Learning in Higher Education is one of the most important projects that employ transparent perspective in teaching and learning. This initiative is developing and assessing the effectiveness of numerous transparent teaching and learning practices in a

wide spectrum of fields. Some of the beneficial learning/teaching practices implemented and assessed as a part of this project are as follows (Winkelmes, M., 2013 (a), 2013 (b)):

1. Discuss assignments' learning goals and design rationale before students begin each assignment.
2. Invite students to participate in class planning and agenda construction.
3. Gauge students' understanding during class using peer work on questions that require students to apply concepts taught.
4. Explicitly connect "how people learn" data with course activities when students struggle at difficult transition points.
5. Engage students in applying the grading criteria that will be used to evaluate their work
6. Discuss and analyze graded tests and assignments in class
7. Offer running commentary on class discussions.

Gillespie, M. K., summarized the growing body of research that supports a purposeful and transparent approach to learning by including the following findings that show (Gillespie, M. K., 2002):

1. Learning itself is a purposeful and a goal-directed activity.
2. An ongoing goal setting process is integral to effective learning.
3. Purposeful and transparent learning builds on learners' prior knowledge and experiences to construct new knowledge.
4. Purposeful and transparent learning also means that learners monitor and assess their own progress.
5. Metacognitive strategies help them to be mindful of what is being learned and what good performance looks like.

Hinrickson, K., (2010) claims that transparency in telling the students "why" makes teaching approaches more successful (Henrickson, K., 2010). Hindrickson identified four attributes of the transparent teaching methods:

1. Tell **what** you are doing
2. Tell **why** you are doing
3. Draw connections to learning outcomes.
4. Helping students to exercise meta-cognitive skills.

Arvidson and Huston (2008) defined transparent thinking as a practice that is intentionally designed and executed to increase the openness between the instructor and student concerning some fundamental assumptions about the course structure, content, or instructor's role (Arvidson et al, 2008). Arvidson et al. (2008) described three main benefits of transparent teaching; timely knowledge, increased trust, and improved faculty and student work (Arvidson, et al, 2008).

Curtis and Wu (2012) presented an understanding of transparency in learning that is characterized by:

Relevance: learners are provided by information on the relevance of the content knowledge and teaching method.

Visibility: Learning is made visible to learners and educators.

Based on this understanding of transparency, Curtis and Wu interpreted learning as

"an extended growth in acquisition, comprehension, application and creation where both the process and the products, are perceivable to learners and educators" (Curtis, et al, 2012).

Archer, A. and Hughes, C. in their book entitles "Explicit Instruction: Effective and Efficient Teaching" presented another perspective of transparent teaching by anchoring it under explicitness value that is characterized by the following features (Archer and Hughes, 2012):

1. Optimize engaged time with respect to time on task through encouraging students to actively participating in instructional activities.

2. Promote high levels of success: The more students engage in an academic task, the more they achieve.
3. Increase content coverage: The more academic content covered effectively and efficiently, the greater potential for student learning.
4. Have students spend more time in instructional groups: Students spend more time participate in teacher-led, skill-level groups learn more.
5. Scaffold instruction: Providing support, structure, and guidance during instruction promotes academic success, and systematic fading of this support encourages students to become more independent learners.
6. Address different forms of knowledge: Knowing different sorts of information at differing levels enhance students' ability to strategically use their academic skills

Transparent Assessment: From Reporting Grades to Reporting Learning

Jacobs, Mary Ann, (2012) calls for accomplishing the daunting task of moving from a system of reporting numbers to transparent assessment system that focus on learning as the ultimate goal. Transparent Assessment is described as the assessment that has a positive impact on instruction and ultimately on student learning and which can be accomplished by executing the following three steps: (1) prioritize the most important intended outcomes, (2) construct the assessment task and make its target knowledge and skills visible to students, (3) clearly define the knowledge and skills needed to successfully complete the assessment (Jacobs, Mary Ann, 2012).

Curtis and Wu (2012) also defined transparency in assessment as the full disclosure of the results of quality reviews and stressed that transparency in assessment goes beyond the disclosure of results to include evaluation. Effective transparent assessment should be (Curtis, et al, 2012):

Accessible: Learners must have access to the review results and access to the assessment process.

Scalable: The assessment model must scale to the demands of the current education environment to conduct evaluations at different levels: individual, programmatic and institutional.

Tools and Products of Transparency

Harden R. M. presented curriculum mapping as a transparent learning and teaching tool that can help both staff and students by displaying key elements of the curriculum, and the relationships between them. Students using curriculum mapping, as a transparent tool, can identify what, when, where and how they can learn. Teaching staff also can be clear about their role in the big picture. The scope and sequence of student learning is made explicit, links with assessment are clarified and curriculum planning becomes more effective and efficient. In this way the curriculum is more transparent to all the stakeholders including teachers, students, curriculum developers, managers, the public and the researcher (Harden, R. M. (2001).

Curtis and Wu (2012) considered Electronic portfolios as a powerful instrument for embracing transparency in learning and assessment through adopting four important attributes: Relevance, Visibility, Accessibility and Scalability (Curtis, et al, 2012).

Nicola Shapland in "Assessment Matters!" website identified eight principles of good assessment which are to be Fair, Appropriate, Valid, Reliable, Transparent, Authentic, Manageable, and Engaging. Transparency refers to how clear the assessment expectations are for students. The degree of transparency can be gauged by asking "Did students understand what was required of them to succeed in the task set for them?" Transparency can be greatly enhanced by:

1. A clear task description: This description enables the students to know what they are expected to do
2. A clear set of criteria and standards: These criteria and standards will help students to know why they will be assessed again.
3. The use of model exemplars: so students know the level of performance expected and what that "looks like" (Shapland, Nicola, 2011)

Dollarhide, Smith and Lemberger (2007) proposed a new practice in counseling to make pedagogy transparent using a new pedagogical strategy termed "transparent counseling pedagogy (TCP)." TCP is a demonstration strategy used in a counseling theories course in which a "counselor" and a "client" interact with students in the class to make the counseling process as transparent as possible. TCP is designed to 1) provide a realistic clinical demonstration in the classroom, 2) promote student involvement for socially constructed learning, and 3) make transparent the counselor's thinking (Dollarhide, et al, 2007).

Frey, N., & Fisher, D. (2009) in their book "Learning Words Inside & Out" shows how to employ powerful vocabulary instruction into teaching. This strategy claims that it makes words learning: (1) intentional: by selecting words for instruction that are worth precious classroom time, (2) transparent: by giving students word-solving strategies by modeling your thinking during read-aloud, (3) useable: by providing oral and written practice through authentic peer activities, (4) personal: by helping words stick through well-designed independent activities, (5) priority: by creating a school wide focus on word learning (Frey, N., & Fisher, D., 2009). Transparent modeling of thinking during the acquisition of new words is very important component of this strategy that helps student grasp vocabulary meaning effectively.

Schalin, J. (2008) in his report entitled "Opening Up the Classroom- Greater transparency through better, more accessible course information" stressed that more accessibility to course information is needed. Schalin, J. (2008) recommends that faculty is required to post their course syllabi (descriptions that go beyond catalog summaries) on the Internet and with access open to the public, also he argues that to be of value to students, this posting should occur when registration opens for the next term's classes (typically two to five months before the term begins) (Schalin, Jay, 2008).

James Lang in his article "Classroom Transparency" stresses the importance of applying an effective transparent teaching approach in the form of devising detailed lesson plans in which both teachers and students know the reasons behind the major decisions about a course such as text choices, classroom activities and the designs of the exams (Lang, J. M., 2007).

The Evolution of Transparent Way of Thinking: Micro Scale Diffusion

> *"In learning about transparency, I experienced a journey around the globe, peeking into places I had never heard of, and finding to my surprise that transparency truly begins at home. So let me be transparent… opening my eyes to my many opaque misconceptions" (Oliver, R., 2004, p vii)*

Based on the previous review of literature, it is evident that transparency is one of the most important instrumental core values that direct our life. While seeking to be more transparent, a new age of transparency is evolving. The instrumental nature of transparency created a hierarchy of core values that interact positively and negatively to determine the optimum performance of the whole set of values. Optical transparency as a seed concept disseminated in all directions to affect a transparent reform in all domains. Organizational transparency took the lead in being implemented in economic and political domains. Education (Teaching and Learning Process) is progressively being reformed by implementing transparency as a core value. The extension of transparency to learning and teaching level indicates that this trend is going to the micro scale level of change. The diffusion of transparency is seen going down to affect the way we think, namely, new way of thinking is in the stage of formulation. These three series of articles are a big stride in this direction.

TTA CORE CONCEPTUAL FRAMEWORK

Optical Transparency as a Seed Definition

According to Online Oxford English Dictionary, transparent meant, "allowing light to pass through so that objects behind can be distinctly seen". Transparency based on this definition points to the capability of the transparent object to transmit light so that the bodies situated beyond can be distinctly seen. This

basic definition indicates that optical transparency encompasses two main properties, first, the permeability to visible light, and second, the visibility of the objects that lies behind. Water, glass, air, crystals, and ice are the most well-known examples of optical transparency.

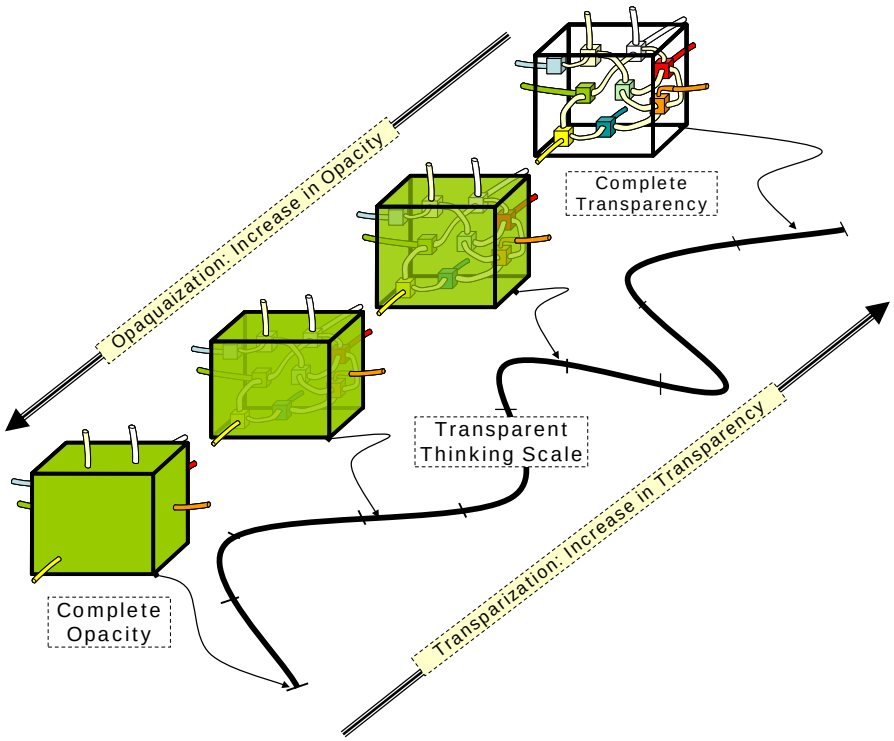
Optical transparency, as any other quality or property, can be easily clarified when an antonym is compared with, which is in this case optical opacity (lack of transparency). Optical opacity, on the contrary, is the quality of not permitting visible light to pass through an object and as a result the objects that lay behind will become invisible, as illustrated in FIGURE 14. The degree of optical transparency or optical opacity can be represented as a continuum that ranges between complete optical transparency and complete optical opacity. Optical translucency is the quality of having a certain degree of transparency or opacity which represents a point on this continuum, as illustrated in FIGURE 14.

Levitt, T. (2009) in her book entitled "The shadow of enlightenment" historically clarified the important role that optical transparency scientific revolution plays in enhancing the political transparency revolution by tracing the life of two physicists, Francois Arago and Jean-Baptiste Biot during the years 1789-1848. Levitt, T. (2009), shows that inventing optical instruments, that expands the visibility of the physical objects, had a crucial effect on the enhancement of visibility of the abstract concepts (social, political, cultural or religious). Optical transparency was the seed that grows to fruit different forms of transparency in different domains.

Coining the Concept of Transparization and Opaquization

A Black box symbolizes the huge burden of discovery that humanity struggled with to reveal its hidden content. Electricity, nuclear energy, bacteria and viruses, diseases, physical and chemical phenomena are some of an infinite list of entities (black boxes) that humans struggled to reveal its nature and contents by trying to convert them into transparent ones, as illustrated in FIGURE 14. All the entities

FIGURE 14
OPTICAL TRANSPARIZATION AND OPAQUIZATION AS A PROCESS OF REVEALING OR HIDING THE CONTENT OF A BLACK BOX POSITIONED ON THE CONTINUUM OF OPTICAL TRANSPARENCY OR OPACITY

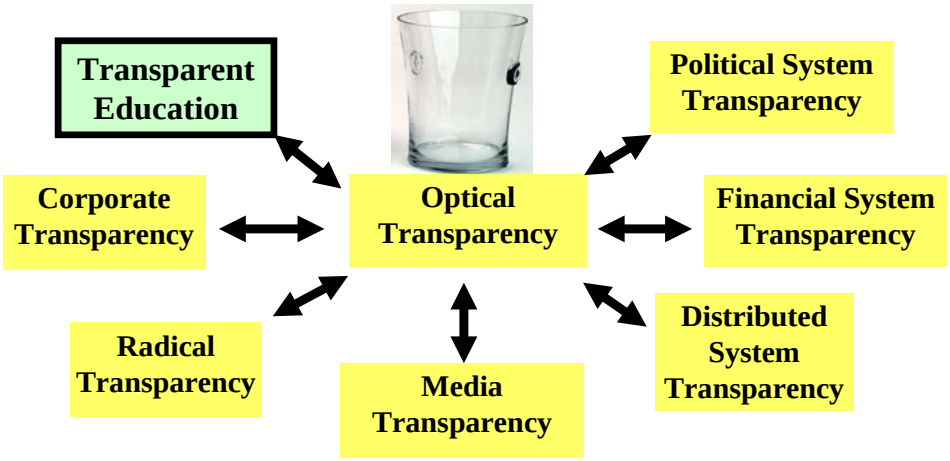


around us where once black boxes for us. It is appropriate at this point to coin two new important terms that are related to transparency and opacity concepts. These two new concepts are transparization and opaquization. As illustrated in FIGURE 14, transparization can be defined as the process of increasing transparency (decreasing opacity) and on the other hand, Opaquization is similarly defined as the process of increasing opacity (decreasing transparency). These two new terms will play a critical role in putting transparency in generic framework. This generic framework will be the template that will be implemented in expanding its transparency concept to other domains.

Diffusion of Optical Transparency in Different Domains

Over the long human history, Optical transparency was the root concept that is expanded to all other areas of life to create different forms of transparency, as shown in FIGURE 15. Radical transparency is a management approach in which all decision making is carried out publicly. Corporate Transparency, as a form of radical transparency, aims to remove all barriers to free and easy public access to corporate, political and personal information and the laws, rules, social connivance and processes. Corporate Transparency is also an indicator of business openness to shareholder and potential investors. Media Transparency is the concept of determining how and why information is conveyed through various means. Banking Transparency and disclosure of bank activities are suggested to prevent future banking crises, underground banking, unpublished accounts, money laundering, tax evasion, and other fraud. Transparent Education is the new area of transparency implementation. These series of articles is offering a big stride to expand transparency to the learning teaching territories as will be explained in details in this series of articles.

FIGURE 15
OPTICAL TRANSPARENCY AS THE ROOT CONCEPT FOR ALL APPLICATIONS OF TRANSPARENCY IN DIFFERENT DOMAINS

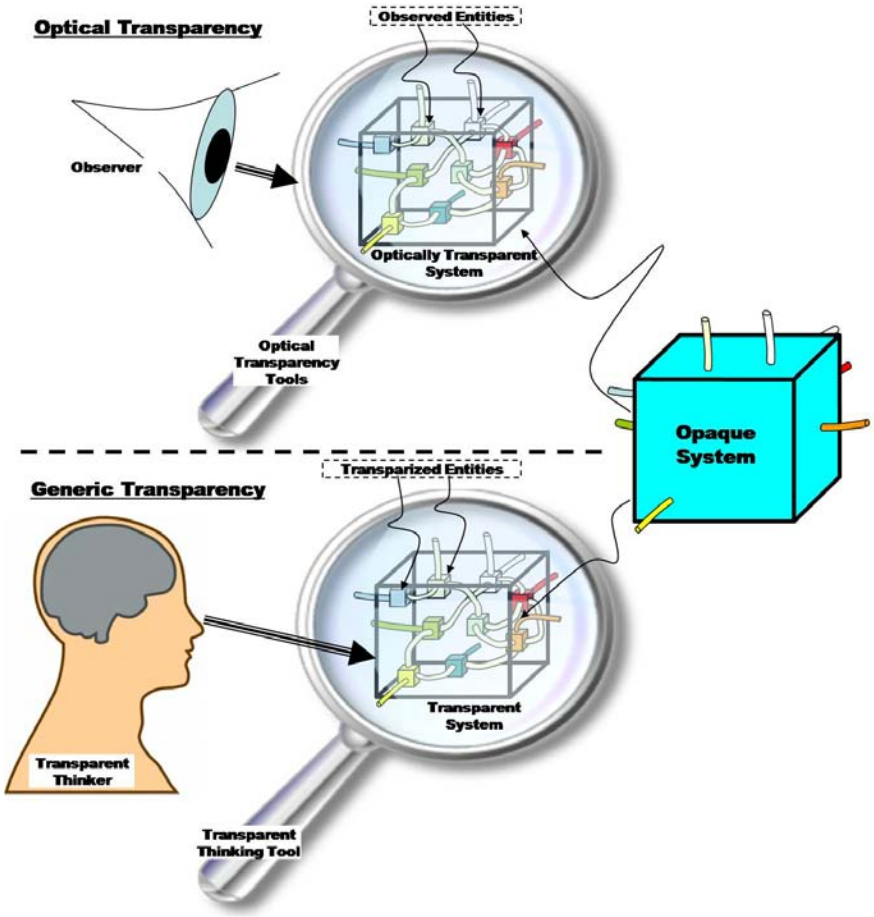


Developing a Generic Core Conceptual Framework

Before applying transparization process to other concepts, it is appropriate to start applying it to transparency itself. Based on analysis of the definition of optical transparency stated above, it can be seen that transparency is a process that comprises of the following four main elements: (1) Observer (Person(s)), (2) Observed System, (3) Observation tool (eye, telescope or microscope… etc.), and (4) Observed Entity (target content in the observed system), as illustrated in FIGURE 16 (a). These four main components of optical transparency are similarly available in all other forms of transparency. For example, in financial transparency the central bank or the ministry of finance represents the observer for the country's financial system. The financial system should be monitored through a transparency tools

and means in order to guarantee that the practices, regulations, and transactions that are processed inside the system are legal and corruption free. In order to put the transparization process components in generic form, It is essential to define a Generic Transparency as the process of Transparent Thinking (TT) in which a Transparent Thinker is transparizing a system by employing appropriate transparent measures or tools to reveal the target hidden system entities needed to be monitored or investigated, as illustrated in FIGURE 16 (b). This generic transparency will help to expand transparency to different field and domains as will be clarified in the next section.

FIGURE 16
DEVELOPMENT OF A CONCEPTUAL GRAPHICAL MODEL OF GENERIC TRANSPARENCY EXTENDED FROM OPTICAL TRANSPARENCY MODEL



Applications of TTA in Different Contexts

To clarify the usability and suitability of the generic framework of transparency (FIGURE 16 (b)), the Transparent Thinking (TT) concept is applied to different contexts (medical, financial, social, educational, political and manufacturing domains). The four main elements of generic transparency is identified for six different domains and listed in TABLE 1. In the area of medicine, the transparent thinker may be a medical analyst that is looking for a certain type of bacteria in a blood sample. In the financial domain, a central bank is transparizing a financial system to monitor compliance with loan practices through financial audit tools. People also can transparize their thoughts through blogging over the internet. More clarifying examples are listed in TABLE 1.

TABLE 1
APPLYING GENERIC TRANSPARENCY DEFINITION ON DIFFERENT DOMAINS

Domain of Transparency	Elements of Transparent Thinking			
	Transparent Thinker	**System**	**Transparent Thinking Tools**	**Transparised Entities**
Medicine	Medical Analysts	Blood Sample	Microscope	Bacteria
Finance	Central Bank Officials	Financial System	Financial Audit Tools	Compliance for Loan Regulations
Society	People	mind	Social Media tools	Thoughts
Education	Educational Administration	School	Performance Evaluation Tools	Learning and Teaching Performance
Politics	Parliament Members	Government	Monitoring Tools	Elections Integrity
Manufacturing	Quality Control Officers	Production System	Laboratory Testing Equipments	Product Quality

TRANSPARENT CONCLUSION (TC)

By the end of the first part of this series, the first job of formulating the conceptual core of Transparent Thinking Approach (TTA) is already accomplished. In the 2nd part, an extended conceptual model of TTA will be introduced.

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