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Introducing a New Theory: Emphasizing From Knowledge Consumption To Knowledge Production in Architecture Design Education

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ABSTRACT: This paper argues for introducing a theory for knowledge integration in architectural design education. A contextual analysis of the reasons for developing a theory is introduced and reasons are categorized. The milieu of the theory is constituted in several contextual elements. The theory encompasses a number of underlying theories and concepts derived from other fields that differ dramatically from architecture. It consists of three major components: the disciplinary component; the cognitive-philosophical component; and the inquiry epistemic component. Each of these components encompasses other smaller components integral to the building of the theory itself. Notably, the three components address ways in which knowledge can be integrated, how the desired integration would meet the capacity of the human mind, how such integration relates to the nature of knowledge and how knowledge about it is acquired, conveyed, and assimilated. Possible mechanisms for knowledge acquisition are an indispensable component of the theory, whose aim is to foster the development of responsive knowledge critical to the successful creation of built environments. This paper conceives two distinct — yet related— types of knowledge in architecture. The first type is knowledge resulted from research that seeks to understand the future through a better understanding of the past — research that tests accepted ideas. The second is knowledge resulting from research that probes new ideas and principles which will shape the future — research that develops new visions and verifies new hypotheses.

Keywords: Architectural education; knowledge integration; transdisciplinarity ;design studio; systemic pedagogy, Mechanistic Pedagogy

I. INTRODUCTION

Architecture is created in a field of tension between reason, emotion and intuition. Keeping this in mind Architectural design pedagogy should be viewed as training toward the manifestation of the ability to conceptualize, coordinate, and execute the idea of building. This act must furthermore be rooted in humane tradition.

There is a need of comprehensive understanding of the role of knowledge in architecture while comprehending how to integrate different modes of knowledge production. Recent years have witnessed a number of phenomenal and continuous changes in the structure of contemporary societies, the emergence of housing problems and squatter settlements, the deterioration of the built heritage, the rising complexity of large structures and new building types, and the recent interest in environmental conservation and protection. Today demands for multiple types of knowledge are clearly on the rise: knowledge of how to create better environments for poor societies; knowledge of how to involve people affected by design and planning decisions in the process of making those decisions; knowledge of how to protect the built heritage; knowledge of how to design environments that do not compete with but complement nature; knowledge and how to deal with problems associated with special populations that form major parcels of contemporary societies such as children, seniors, the disabled, and the poor; knowledge that responds to socioeconomic and sociopolitical issues; and knowledge that responds to advances in building and telecommunication technologies.

In This paper I will discuss about two distinct yet related types of knowledge in architecture. The first type is knowledge resulted from research that seeks to understand the future through a better understanding of the past — research that tests accepted ideas. The second is knowledge resulting from research that probes new ideas and principles which will shape the future — research that develops new visions and verifies new hypotheses. Through this paper I proposes that Architectural Design education should be centered on critical inquiry and knowledge acquisition and production.

A theory is conceptualized that argues for a more responsive architectural design pedagogy, enabling future architects to create livable environments.Metaphorically, the theory is conceived in terms of a triad consisting of three major components: the disciplinary component; the cognitive-philosophical component; and the inquiry-epistemic component. Each of these components encompasses other smaller components integral to the building of the theory itself. Notably, the three components address ways in which knowledge can be integrated, how the desired integration would meet the capacity of the human mind, how such an integration relates to the nature of knowledge and how knowledge about it is acquired, conveyed, and assimilated.The aim of this theory would be to foster the development of responsive knowledge critical to the successful creation of built environments.

A. Why Introduce A Theory for Knowledge Integration?

Critical to the introduction of a theory for knowledge integration in architectural design education is a discussion of the underlying reasons for developing it.These reasons have been categorized in terms of the following points: admission policies and the skills emphasis syndrome, idiosyncrasies in knowledge delivery and acquisition in architectural education, and some alarming figures on studio teaching practices.

(i) **Admission Policies and the Skills Emphasis Syndrome**

The practice of architectural design education appears to be remarkably similar in many parts of the world due to the overriding primacy given to the studioas the main forum for exploration, interaction, and assimilation (Salama,1995). Such similarity enables significant mobility of architects among firms, areas of expertise and locales, even where cultural differences are dominant.

Based on the surveys conducted on admission Policies in schools of architecture worldwide, results indicate that Emphasis is placed on high school records, skill-based aptitude test and portfolio submission.the different admission policies that emerged from the analysis reflect a sustained emphasis on the skills needed for enrolment, while knowledge and critical thinking abilities of applicants as they relate to architecture and the overall built environment appear to take a back seat. By and large, admission policies reflect the tendencies to emphasize skills in drawing and form manipulation, at the expense of other pedagogical aspects and learning outcomes in Architecture Education. There is a need to analyse the success and failure of admission criteria and the way in which they may shape the attitudes of future architects for creating liveable environments.

(ii) **Idiosyncrasies on Knowledge Delivery and Acquisition**

Scholars and educators in Architecture Education have emphasized that research should be viewed as part of everyday actions and experiences. The traditional teaching practices have long encouraged students to develop form manipulation skills by emphasizing intuition, reflective observation, and concept formation (Juhasz, 1981; Salama, 1995; Sanoff, 2003; Seidel, 1994). However, these practices are hypothetical, largely unconcerned with real life situations, and neglect equally important skills that can be enhanced through experiential learning, research, or real interaction with the realities being studied. Prepare Your Paper Before Styling

In traditional teaching practices, architecture students are typically encouraged to conduct site visits and walkthrough the built environment in order to observe different phenomena. Unfortunately, research indicates that these visits and exercises are simply casual and are not structured in the form of investigation or inquiryAs a result, students do not know what to see and what to look for in the built environment, leading to students' inability to think criticallyor develop their intellectual skills. This handicaps their abilities to gather, analyze, synthesize, and process different types of information. So there is a great need of knowledge acquisition and the introduction of research based pedagogy (Fisher, 2004; Groat, 2000).

There is an urgent need to confront issues that pertain to the nature of reality ("what") and the way in which knowledge about that reality is conveyed to our budding professionals ("how").Along with this, there is a need for the discipline of architecture to develop a quantifiable body of knowledge by calling for a departure from the art paradigm that the profession and its education are based upon, towards one based on science and research (Amos Rapport,1994).

In most of cases, Traditional Teaching method the processes that led upto this product are often hidden. However, Integral part of learning include how projects were created, what was the client nature and intentions, how the project was delivered, and how construction was undertaken.

The learning from actual environment should be introduced. Emphasis should be made on developing the abilities of students to explore issues that are associated with the relationship between culture and the built environment. Challenge before us is that how real life issues could be introduced in theory and lecture courses (Morrow,2000:Romice and Uzzell,2205).

B. Some Alarming Figures on Studio Teaching Practices

On basis of study it has been found that a considerable number of design instructors view architecture as an art of making, not as an act of making.This supports the argument that creativity is defined in terms of creating, inventing, and manipulating formal configurations.

Creativity in this sense is limited to only intuition and talent. Some instructors determines a student performance based on his/her drawing skills. While it has been found that some design instructors introduce social issues, and the majority introduce aspects related to user needs, special populations, and accessibility, I believe that allowing students to develop the architectural program should be the most important approach if want to develop a set of Design Imperative that relate to user population.

In Traditional Architecture Design Education students have insufficient opportunities to attain the ability of exploring the nature of knowledge and its role in design, where design experience is limited to concept formation and schematic design. So, we should emphasize more on the Design Process, exploring responsive methods and techniques for designing than focusing on the product. Through this paper my concern is to improve the status of design studio teaching and integrating the missing knowledge components in Architectural Education.

II. THE MILIEU OF THE THEORY

The context of a theory for knowledge integration in architectural design education can be exemplified by three general aspects: a) Derived from the reasons for introducing a theory there are negative impacts, produced by traditional teaching practices, which characterize the context, b) certain paradigm shifts do exist reflecting new ways of understanding and approaching the design of built environment in education and in practice, c) the negative impacts and paradigm shifts lead to a number of contextual questions that the theory attempts to address.

A. Negative Impacts of the Current Culture of Architectural Education

The negative impacts of the current culture of Architectural Education has been identified in terms of: a)Architectural Education Culture: b)is impact on students: and c) its impact on the profession's context. The current culture of architectural education is characterized by high advocacy and low inquiry while most criteria for students' performance and success are ambiguous. It socializes its members through high emphasis on form and abstract aesthetics while superficially adopting fragmented pieces of knowledge on technology, ecology, social sciences, sociopolitical and socioeconomic aspects.

The impact of this culture on students and practitioners is envisioned in terms of the difficulty they encounter in explaining their work to others, and the inadequate language they use when communicating with non-architects. Moreover, such a culture leads students to learn to develop hypothetical solutions but not to test them; and learning to defend their final product (project) but not to explain the process that led to it .What one would expect of the impact of the current culture on the overall Architecture Education is that the students after coming in profession would design buildings that are functionally and economically inefficient. This would create dissatisfaction and discouragement among users for seeking architectural services.

B. The Shift from Mechanistic Pedagogy to Systemic Pedagogy

There is strong evidence that a shift in education and practice does exist (Schon, 1973, 1988; Ackoff, 1974). Such a shift is best expressed from "mechanistic" to "systemic" pedagogy.Following the mechanistic paradigm, the educational process of architecture is reduced to a large number of disconnected components. Education is decomposed into schools, curricula, grades, subjects, courses, lectures, lessons, and exercises. Formal education must be conceptualized as part of a process much of which takes place within society which is a characteristic of the systemic paradigm.

The mechanistic orientation of pedagogy results in the treatment of students as if they were machines with the combined properties and characteristics of tape recorders, cameras, and computers. The student is evaluated with respect to his/her ability to reproduce what he/ she has been told or shown.In the mechanistic paradigm, educators in Architecture make little or almost no effort to relate the pieces of information they dispense. A course in one subject does not refer to the content of another. This reinforces the concept that knowledge is made up of many unrelated parts, and thereby emphasis is placed on hypothetical design assignments (or paper architecture) in Architecture Design Education rather than real-life issues. Inversely, the systemic paradigm focuses on grasping the relationships between different parts of bodies of knowledge.

In the context of relating the systemic paradigm to the need for knowledge in architectural education, We should relate three basic abilities for investigating and understanding the physical environment. These are:a)the holistic behavior of the phenomena which we are focusing on, b) the parts within the thing and the interaction among those parts which causes the holistic behavior we have define, and c)the way in which this interaction among these parts causes the holistic behavior defined. (Alexander, 1966).

We need to teach knowledge about everyday environment. How it is structured, what we can learn from historic and contemporary evidence, how different examples compare, how it behaves over time and responds to change of inhabitation or other circumstances… Teaching architecture without teaching how everyday environment works is like teaching medical students the art of healing without telling them how the human body functions. (Habraken, 2003).

Systematic paradigm in design Pedagogy places emphasis on learning by experience, learning by exploring and doing,while adopting the hidden curriculum concept — a concept that expresses the interactional process and the everyday experiences manifested by the daily routines of students and teaching staff.

C. Knowledge Content Transformations

Three knowledge content areas are emerging to reflect continuous shifts in knowledge content. These are: environmentbehavior studies (EBS), sustainability and environmental consciousness, and digital technologies or virtual practices. EBS adopts the vision that the properties of the parts can be understood only from the dynamics of the whole, eg. Housing.Environment-behavior paradigm can be defined as the systematic examination of relationships between human behavior, cultural values, and the physical environment (Moore, 1979). There is a need of implementing several underlying concepts that include predesign research, architectural and project programming, post occupancy evaluation, user participation, and community design (International academic community of architecture).

Another form of knowledge content transformation is sustainability and environmental consciousness.This new paradigm is conceived to value the environment alongside economic development, and to value social equity alongside material growth.Eco-development, ecosystem planning, bioregional planning, and green and sustainable design are all new ideologies and concepts that place emphasis on resolving environmental problems caused by human activities. They address the kind of development that meets the needs of the present generation, without compromising the ability of future generations to meet their own needs (ECE, 1996). The same technology that has been employed to subdue and conquer nature needs to be employed for thebenefits of nature. It is believed that this characteristic of the new paradigm creates the need for mature and competent professionals. Professional development will need to include the practice of interdisciplinarity and transdisciplinarity, and to develop lifelong earning skills. This new paradigm could be successful only if architectural design education would be able to accommodate such knowledge content in an effective manner.

Digital technology or virtual practice is the third form of knowledge content transformations. Digital technologies and design in virtual environments are re-shaping architectural education and practice (Beamish, 2002; Maher *et al* 2000; Schon *et al.,* 1998; Yee *et al.,* 1998). Developments in CAD, visualization, and digital modelling coupled with the advanced technology to communicate data, images, and life action design experiences, have enabled virtual dimensions in studio instruction. Such knowledge content transformations are contributing in restructuring of Architectural Education.

The reasons for a developing a theory for integrating knowledge in Architecture Design Education and the context within which such a theory is envisioned – including knowledge content transformations-reveal some critical questions: These questions can be stated as follows:

a) Does the current system of architectural education introduce and integrate different types of knowledge needed for the successful creation of built environments?

b) Does the current system of architectural education place high value on research and knowledge acquisition?

c) Has it responded to the dramatic changes the profession is witnessing?

d) Has it reacted effectively to the demands placed in the profession by society?

e) Has it responded to the knowledge content transformations?

Based on the current context of the profession and its underlying ills, one can answer that the current system of architectural education still socializes its members into predominantly artistic terms. It still focuses on social, technological, or economic terms, still focuses on skill development, still adopts pedagogical methods and design approaches s not equipped to efficiently and effectively address contemporary problems. The value of introducing a theory becomes evident when sustaining our thinking of these questions and their answers.

III. THE THEORY APPARATUS

A theory for knowledge integration suggests a different form of thinking that goes beyond typical discussions of modifying architecture curricula, or massaging studio pedagogy and the teaching/learning processes involved.The theory is metaphorically conceived in terms of a triad consisting of three major components: the disciplinary component; the cognitive-philosophical component, and the inquiry-epistemic component. The three components address ways in which knowledge can be integrated, how the desiredintegration would meet the capacity of the human mind, how such an integration relates to the nature of knowledge, and how knowledge about it is acquired, conveyed, and assimilated.

A. The Disciplinary Component: Beyond Mono Disciplinarity

Donald Watson attempted to define a demand for knowledge in architecture and the built environment. He argues that: “The discipline (Fig. 1) of architecture needs a rigorous knowledge base by which to support its premises and principles that define the relationship between human and community health, and between building and urban design,” (Quote from Boyer and Mitgang, 1996).

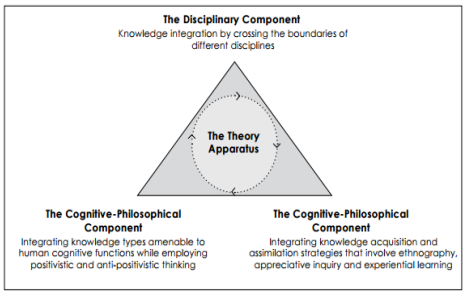

Fig. 1. Components and mechanisms of a theory for knowledge integration in architectural design education. (Source: A. Salama).

The work of Klein, 1998; Ramadier, 2004; and Lawrence and Depres, 2004 suggest that transdisciplinarity is envisioned to tackle complexity while challenging fragmentation. As a mode of knowledge production, it is characterized by its hybrid nature and nonlinearity — transcending any academic disciplinary structure.

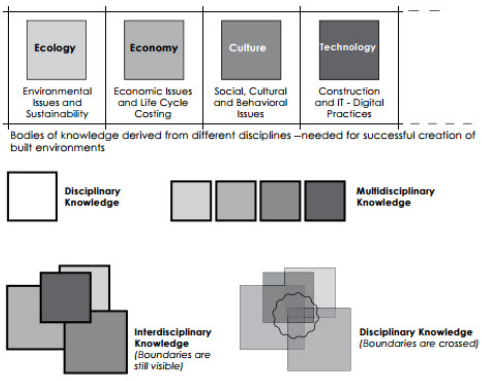

Fig. 2. Transdisciplinarity and its challenging to disciplinary boundaries and knowledge fragmentation. (Source: A. Salama).

Transdisciplinary knowledge is a result of inter-subjectivity — a process that includes practical reasoning of individuals within the constraints of social, organizational, and material context, requiring continuous collaboration between different disciplines (by crossing their boundaries) (Dunin Woyseth and Nielsen, 2004). Transdisciplinarity (Fig. 2) entails making linkages not only across disciplinary boundaries but also between theoretical development and professional practice, addressing real world problems and contributing to their solution.

B. The Cognitive Philosophical Component

Integral to the cognitive philosophical component is the way in which we approach designing built environment based on our capacity as humans, and based on the nature of knowledge about the realities we encounter. Therefore, this component is structured in three sub-theories or body of concepts: the split brain theory, Jungian psychological types (epistemological balance), and the two widely held concepts about the nature of reality and they way in which knowledge about that reality is conveyed.

(i) The Split Brain Theory

Mind research provides insights into the understanding that we possess two different but complementary ways of processing information. A linear step-by-step process analyzes the parts that make up a pattern, working on the left side of the brain, Foreg. It deals with numbers, words, and parts; and a spatial relational style seeks and constructs patterns, working on the right side of the brain (Williams, 1983), foreg. It deals with images, patterns and wholes. Architectural education is unique since it requires the full activation of the two sides. It encompasses courses that address bodies of knowledge that are rational, analytical and abstract in nature while implementing them into intuitive and imaginative design activities.

(ii) Psychological Types and Epistemological Balance

Carl Gustav Jung emphasized the importance of balance and harmony. He cautioned that modern humans rely too heavily on science and logic and would benefit from integrating spirituality and an appreciation of the unconscious realm (Jung, 1987). The psychological types or the epistemological balance that Jung called for matches the concept underlying the split brain theory (Jung, 1976). Within such a balance, it is postulated that people can feel, think, perceive, and imagine both as individuals and in groupings. However, it is conceived that some human functions tend to inhibit other functions. Thinking and feeling, perception and intuition, and introversion and extroversion block each other. Each function in this balance has its own particular area in which it performs better than in others. Arguably, and for the purpose of classification, if architecture as an educational and professional discipline is composed of art and science, then one could assert that the art component is addressed by human functions such as feeling, intuition, and introversion, while the science component is addressed by thinking, perception, and extroversion.

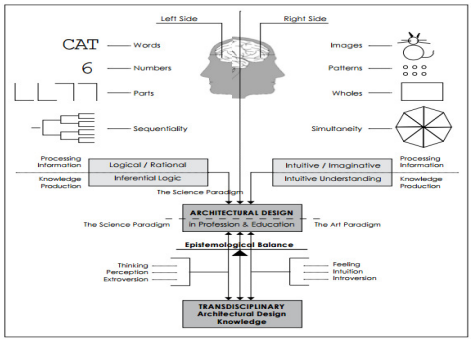

Fig. 3. Linking the Split Brain Theory and Jungian Epistemological Balance to architecture pedagogy and learning. (Source: A. Salama).

This understanding would have strong implication on the way in which architectural curricula and their contents are structured, and also on the processes and procedures adopted in studio pedagogy (Fig. 3).

(iii) Philosophical Position

There are two basic philosophies that can be conceived as the basis for understanding architecture and its education: positivism and anti-positivism. Derived from these philosophies, two positions are conceived based on ontology and epistemology.In positivism, a building is seen by educators and students as an objective reality with components and parts that everyone can observe, perceive and agree upon. While adopting the anti-positivistic view would result in an emphasis upon values, preferences, lifestyles of people — who use, perceive, and comprehend the built environment — while leading to the presence of multiple understandings, perceptions, and viewpoints.The implications of these two philosophical positions are critical for a pedagogy that aims at integrating different types of knowledge as they relate to people.

C. The Inquiry-Epistemic Component

The inquiry-epistemic component addresses methods and tools by which knowledge is acquired. Integral to this component are three mechanisms:ethnography, appreciative inquiry, and experiential and active learning.

(i) Ethnography

Ethnography refers to the genre of writing that presents varying degrees of qualitative and quantitative description of social and behavioral phenomena as they relate to the built environment.Ethnographic studies are based on the premise that any phenomenon and it underlying properties cannot be well understood independently of its context exemplified by other phenomena.

In architectural design education, ethnographic studies can be utilized in various forms, from the macro level to the micro level. These address broadly or narrowly defined cultural groupings according to the scale of design or planning projects. Ethnographic studies may involve -emic or -etic perspectives. The Emic perspective represents the way the member of a given culture perceives the environment around them, while the Etic perspective represents the way non-members (outsiders) perceive and interpret behaviors and phenomena associated with a given culture. These perspectives are important components that students need to understand, and their resulting knowledge needs to be incorporated in their design assignments.

(ii) Appreciative Inquiry (AI)

Based on the belief that human systems are made and imagined by those who live and work within them, Appreciative Inquiry leads systems to move toward the generative and creative images that reside in their most positive core — their values, visions, achievements, and best practices (Watkins and Mohr, 2000).In theory, AI is a perspective, a set of principles and beliefs about how human systems function, a departure from the past metaphor of human systems as machines. In practice, AI can be used to co-create the transformative processes and practices appropriate to the culture of a particular organization.

AI can be applied in either classroom or studio settings. In classroom settings, students can be involved in a process of identifying positive aspects in specific environments or building types, and they can also perform various research assignments and Post Occupancy Evaluation (POE) studies. These represent a radical shift in the way in which POE evaluation studies typically aim at revealing problems. In studio settings, Appreciative Inquiry can be introduced in various pre-design assignments. That will involve participatory design activities ranging from identifying design and project imperatives involving users' representatives, to precedent studies that aim at unveiling positive aspects found in environments similar to the one they are designing.

(iii) Active and Experiential Learning

In Architecture education faculty should develop teaching approaches that represent transformative pedagogies, simply moving away from thinking of students as passive listeners to active learners.The major characteristic of active learning is that students are engaged in individual or group activities during the class session including reading, discussing, commenting, and exploring.While these activities are carried out by the students, they are facilitated by the professor, and students can receive immediate feedback (Bonwell, 1996). In active learning students are involved in higher-order thinking that simultaneously involves analysis, synthesis, and evaluation of a wide spectrum of issues and phenomena. In the context of the university classroom, active learning involves students in doing things and thinking about what they are doing.

Experiential learning refers to learning in which the learner is directly in touch with the realities being studied (Keeton and Tate 1978). For e g. In class of 'principles of architectural design' or in 'human-environment interactions' might involve critical analysis exercises on how people perceive and comprehend the built environment. Both classes might involve field visits to buildings and spaces where students are in close contact with the environment, exploring culture, diversity, people behaviour, and be part of that environment. All of these mechanisms involve an experiential learning component.

Active and experiential learning share similar aims and qualities. They both aim at increasing students' motivation, placing emphasis on the exploration of attitudes and values. In both of them, less emphasis is placed on knowledge transmission but greater emphasis is placed on developing students' critical thinking abilities.

It is evident that three components are the core of a theory for knowledge integration in architectural design education (Figure 3).

They represent the theory apparatus and have the capacity to integrate fragmented pieces of knowledge required for the "whole Architect." While the disciplinary component aims at knowledge integration by crossing the boundaries of different disciplines involved in the successful creation of built environments, the cognitive-philosophical component endeavors to integrate knowledge types amenable to human cognitive function and the overall human capacity in thinking about or creating built environments. However, through ontological and epistemological thinking it attempts to address the nature of knowledge and the way in which knowledge about it is conveyed, acquired, and assimilated. The inquiry epistemic component targets the issue of knowledge integration by introducing knowledge and acquisition and assimilation strategies.

IV. CONCLUSION

In this paper, I argued for the introduction of a new theory for knowledge integration in architectural design education.A contextual analysis of the reasons for developing a new theory was introduced and reasons were categorized in terms of admission policies and the skills emphasis syndrome, idiosyncrasies on knowledge delivery and acquisition, and alarming figures on studio teaching practices based on survey results. Based on the belief that any theory is conceived, developed and perhaps implemented in a specific context, I outlined the milieu of the theory. Other contextual elements included the shift from mechanistic to systemic pedagogy, and knowledge content transformations.While certain aspects of any theory remain conceptual, most components of the theory apparatus can be implemented in various forms and at different levels through sound practices. Such components can also be implemented in architectural design education.

The disciplinary component can be accommodated at different levels that range from the knowledge delivery level, to studio level, to degree level (Fig. 4). In this context, there is a clear separation between knowledge acquisition and knowledge application. Transdisciplinary approach occurs by reconciling lectures and studios through the introduction of a "new setting" — an alternative to classroom and studio settings where bodies of knowledge are delivered by different teaching staff, while at the same time students apply what is delivered to them in specific design assignments facilitated by the same staff.

At the studio level, the Transdisciplinary approach can be partially accommodated by introducing graduation thesis projects through Transdisciplinary design studios, where students of different disciplines (planning/urban design, landscape architecture, architecture, industrial/ product design, engineering, etc) work in team projects.

In this context, the challenge would be to identify projects and processes that can be controlled to meet such a specific pedagogic orientation. Studio processes in the preceding two scenarios need to address the cognitive-philosophical component: the integration of the logical/rational and the intuitive/imaginative capacities of students. As well, they should strike the balance required between different psychological types or cognitive functions introduced by Jung. In this regard, a studio process can be looked at in terms of two major phases: analytical understanding and creative decision making.

At the degree level, crossing the boundaries between different disciplines can be accommodated in a transdisciplinary master degree in designing built environments.

The inquiry-epistemic component can be strategically accommodated in a studio setting when integrating three different types of knowledge that Rapoport called for: knowledge about setting objectives, knowledge about better environments, and knowledge about achieving socio-behavioral goals in design. For these knowledge types to be integrated it is essential to employ the three mechanisms of inquiry, i.e, ethnography, appreciative inquiry, and experiential and active learning.

It important to relate these types of knowledge and the mechanisms of inquiry to the studio level, the scale of the project, and the issues involved. This is envisaged when a studio process involves three major components "what" and "who, how, and why". What and who are characterized by involving students in proposing human activities and are appropriate for certain types of spaces and buildings, how is the act of design itself that is characterized by manipulating forms in response to well articulated and defined spatial needs, and why represents students' involvement in exploring why a certain type of space and form is appropriate for a certain type of user population.

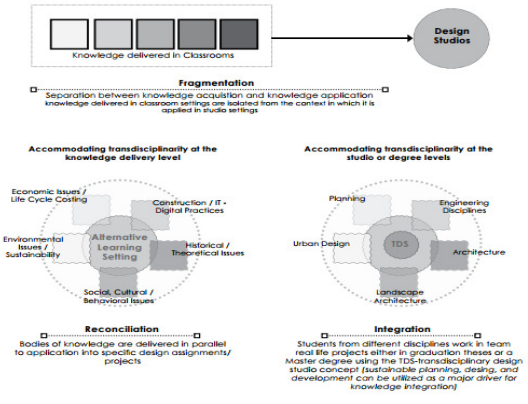

Fig. 4. Strategic accommodation of transdisciplinarity at the knowledge delivery, studio, and degree levels (Source: A. Salama).

Again, the act of design in this process should address the cognitive philosophical component; by integrating the logical/rational and the intuitive/imaginative capacities of students, while at the same time striking the required balance between different psychological types or cognitive functions.

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