

CRITICAL ENVIRONMENTALISM AND THE PRACTICE OF (RE)-CONSTRUCTION:

Applications of Digital Technologies for Increased Participatory Interaction in Architectural Urban Design and Community Development Scenarios

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Abstract. This research focuses on the implications and applications of “critical environmentalism” as a quintessential epistemological framework for urban interventions while implementing digital applications that foster collective, round-table approaches to design. Essentially centering the environment (*Umwelt*) as an encompassing and interconnecting catalyst between multiple disciplines, philosophies, and modes of inquiry and technologies, the framework reciprocally fosters individual and critical identities associated with particular places, belief systems, and their participants as a primary concern. Critical environmentalism promotes a comprehensive, reciprocally unifying epistemological framework that can significantly inform architectural interventions and the tethered use of its technologies in order to foster increased vitality and a certain co-invested attention to the complexities of the greater domain.

Grounding the theory in pedagogical practice, this paper documents an approach to urban design and architectural education, implemented as a case-study and design scenario, where divergent perspectives amalgamate into emergent urban configurations, critically rooted in the conditional partialities of place. Digital technologies are

incorporated along with analogical methods as tools to integrate multiple perspectives into a single, working plane. Engaging the above framework, the approach fosters a critical (re)construction and on-going, co-vested regeneration of community and the context of place while attempting to dialogically converge multiple urban conditions and modes-of-thought through the co-application of various digital technologies. Critically understanding complex urban situations involves dialogically analyzing, mapping, and modeling a discursive, categorical structure through a common goal and rationale that seeks dialectic synthesis between divergent constructions while forming mutual, catalyzing impetuses between varying facets.

In essence, the integration of varying technologies in conjunction, connected to real world scenarios and a guiding epistemic framework cultivates effective cross-pollination of ideas and modes through communicative and participatory interaction. As such it also provides greater ease in crosschecking between a multitude of divergent modes playing upon urban design and community development. Since current digital technologies aid in data collection and the synthesis of information, varying factors can be more easily and collectively identified, analyzed, and then simultaneously used in subsequent design configurations. It inherently fosters the not fully realized potential to collectively overlay or montage complex patterns and thoughts seamlessly and to thus subsequently merge a multitude of corresponding design configurations simultaneously within an on-going, usable database.

As a result, the pedagogical process reveals richly textured socio-cultural fabrics and thus produces distinct amplifications in complexity and attentive management of diverse issues, while also generating significant narratives and themes for fostering creative and integrative solutions. As a model for urban community and social development, critical environmentalism is further supported the integrative use of digital technologies as an effective means and management for essential, communicative interchange of knowledge and thus rapprochement between divergent modes-of-thought, promoting critical, productive interaction with others in the (co)constructive processes of our life-space.

1. Introduction to the Epistemic Model

*“In such disconcerting and magnificent times,
knowledge becomes the only source to restore meaning,
and thus meaningful action.”- (Manuel Castells 1993, p.477)*

*“...We are in a tunnel, at the twilight of dogmatism
and the dawn of real (authentic) dialogues.”
- (Frampton 1992 cited Ricoeur 1961, p314)*

Although cosmopolitanism implies global and even universal notions, encompassing compound readings of the urban fabric, it is essential to cultivate the specificities of place, especially during significant changes. Paradoxically, following Paul Ricoeur (1964), how does participation in modern, universal civilization also involve surfacing rich, inherent sources for our interpretive thinking? As society becomes evermore complex, urban designs are mandated to critically correspond and emerge from systemic processes that foster productive and effective interchange of ideas from broad ranges to consequently respond with significant courses of action in the greater, immanent domain, while reciprocally preserving the inter-subjectivity of the individual-in-place. Participation in modern, universal civilization and its new technological manifestations need not leave behind cultural foundations but intrinsically surface rich, inherent sources for its future.

Urban design is affected by a fluxing array of forces and conventions. As society becomes more complex, architectural approaches to the urban fabric diversify to handle new situations, each of which mandate a dynamic, paradigmatic review of current knowledge bases and the processes effecting design reasoning. Complex urban designs must emerge from synthesizing approaches to pluralistic and interactive, systemic contexts to consequently respond with meaningful courses of action. Since knowledge is accessed and interpretably incorporated in varying fashion, there is a tendency for fragmentation within the system that leads to disjunction and marginal relations with the greater domain. The issues are in part accelerated by recent changes and exponential increases in the complexity of such systemic forces mixed with escalating and un-tethered informational and technological advances, which has compounded in varying degrees of separation between the significant totalities of the life-space we reciprocally embody. While a rift can be found even between the technologies we incorporate, it is important to maintain the intrinsic need for communication and thus mediation between disparate facets as the basic impetus.

This research focuses on the implications and applications of “critical environmentalism” as a quintessential epistemological framework for urban

interventions while implementing digital applications that foster collective, round-table approaches to design, amalgamating multiple perspectives into a single, working plane. Critical environmentalism is an inclusive philosophy that addresses common issues currently emerging across numerous disciplines, but has not yet become part of mainstream architectural thinking. The concept incorporates critical social theory, practical hermeneutics, phenomenological embodiment, critical regionalism and place studies, as well as wide-ranging environmental and socio-cultural praxis. The tenets of critical environmentalism promote broader definitions of architecture, critically embodied and epistemologically accountable within a total life-space. Essentially centering the environment (Umwelt) as an encompassing and interconnecting catalyst between multiple disciplines and philosophies, it reciprocally fosters individual and critical identities associated with particular places, belief systems, and their participants. Critical environmentalism promotes a comprehensive, reciprocally unifying epistemological framework that can significantly inform architectural interventions and the tethered use of its technologies to foster increased vitality and a certain co-invested attention to the complexities of the greater domain.

Critical environmentalism references critical theory and its inherent bearing in hermeneutical and dialogical processes. The studio-design scenario incorporates a process identified as a “hermeneutic dialectic” (also referred to as “collaborative” or participatory “interactive inquiry”) (Erlandson et al 1993, p.124; Lincoln and Guba 1989, pp.142-155). The process is ‘hermeneutic’ because it is (co)interpretive and “constructivist in nature” and ‘dialectic’ because it “seeks a synthesis through comparison and contrast of divergent views,” but also forms connections “between them that allows for mutual exploration by all parties”(Erlandson [et al] 1993; Lincoln and Guba 1989). It promotes a divergent inquiry, “that is also in tune with the emerging thought of the time and significance for the world outside itself,” (Erlandson et al 1993) and allows for ‘other’ fields of inquiry to be drawn into the periphery of research. Dialog reveals varying points of view within a community, in this case the community of knowledge currently informing the urban fabric.

The method takes a constructivist view toward hermeneutic inquiry that allows knowledge bases to dialectically emerge from the cross-pollination of knowledge. The focus and content of the research methods is allowed to change or emerge in the process of discovery, rather than a set of predetermined outcomes, a flaw of many reductivist design solutions. The method intrinsically promotes a dialogic between a multitude of knowledge bases in order to interpretively generate a way of seeing the total picture. Dialogical methods are “built on the idea that education is a continuum of dialogs between participants rather than monological” (singular, reductivist

approach) that “takes part in the collective enterprise of learning” (Ricoeur 1961; Frampton 1992, pp.314-327). Transactions between participants are conducted on the basis of exchange of experience, knowledge, and ideas between informed individuals on a particular facet of the design. The meeting process in the event-space of dialog sets stages for relationships to be reflected and then put into action (movement) through communicative processes to evaluate and assign values to unique circumstances in their milieu. Habermas proceeds to connect interactive communication, in which the norms of a community and the social roles of actors become important constraints of perceived socio-moral appropriateness of actions. Expressive communication focuses upon the fact that individual actors respectively constitute a public for each other, negotiating the truthfulness of communicative actions. Habermas states that a “decentered understanding of the world presupposes that relations to the world, claims to validity, and basic attitudes have become differentiated. De-centering draws attention to the structures of interaction themselves within the life-world as the context for embodied interaction and thus communal understanding (Habermas 1990, pp.116-188).

Hermeneutics is by its nature initially subjective and transactional. To Gadamer (1989), there is no true universal other than the hermeneutic process of all “inter-human experience,” in action, bound in the textual. He presents that critical understanding emerges through communicative interaction seeking a “fusion of horizons” between participants, through which an ‘authority’ and applicability emerge (Palmer 2000, pp.381-393; Lincoln and Guba, 1989). Hermeneutics appropriates knowledge through iterative, interpretive processes that proceed to fine-tune the system, where the inquirer(s) can construct the world and in-turn allows for new unfoldings. Gadamer’s view (1989) of the hermeneutic processes entails circular reiteration of the three basic components: interpretation, understanding, and inevitable application. In this way, a practical hermeneutic is a viable proposal to serve social purposes as in urban design processes, in this case, the educative design processes of a community in productive action and its relation to an overall, expanding view toward knowledge integration into greater systems of thought. Understanding is interpretive and grounded in action (in situ) with the addedness of our rationale to organize action (Gadamer 1989). This rationality is further modified through phenomenological approaches, rooted in interpretation. To Merleau-Ponty “To say that there exists rationality is to say that perspectives blend, perceptions confirm each other, a meaning emerges. But it should not be set in a realm apart, transposed into absolute Spirit, or into a world in the realist sense” (Olkowski 1996 cites Merleau-Ponty 1962, p27). Human perception is in itself a “creative process” of knowing and “handling

the world” (grasping) – thus simultaneously making [authentic] meanings as well as (understanding of) ourselves through “transactions with the world and with other beings.” (Merleau-Ponty 1962). This realization embraces the synthesis of the subject as part of an overall system. Knowledge is derived from the world, thus our constructions, with others, are immanently connected.

Grounding the theory in pedagogical practice, this paper documents an approach to urban design and architectural education, implemented as a case-study and design scenario, where divergent perspectives amalgamate into emergent urban configurations, rooted in the conditional partialities of place. Following the above framework, the approach fosters a critical (re)construction and on-going, co-vested regeneration of community and the context of place while attempting to converge multiple urban conditions and modes-of-thought through the dialogic co-application of various digital technologies. In essence, the integration of varying technologies in conjunction cultivates effective cross-pollination of ideas and modes through communicative and participatory interaction and as such provides greater ease in crosschecking between a multitude of divergent modes of thought playing upon urban design and community development. Since current digital technologies aid in data collection and the synthesis of information, varying factors can be more easily and collectively identified, analysed, and then simultaneously used in subsequent design configurations. It inherently fosters the not fully realized potential to collectively overlay or montage complex patterns and thoughts seamlessly and to subsequently merge a multitude of corresponding design configurations simultaneously, which also has long-term implications as an on-going, usable database. The media, at various levels of technologies, can be used as devices to effectively mediate divergent interpretive design processes effecting complex urban settings.

2. Analog to Digital Dialog

Creative production initiates with corresponding models that foster a productive and effective interchange of ideas from broad ranges. The design education process is viewed as an “embedded case study” of a certain community’s views on a particular subject at a particular point in time (Groat and Wang 2002; Stake 1995, 2000; Yin 1994;). The urban design process incorporates a model case study method developed by the ETH-UNS Zentrum Zürich Nord whose “main objective has been to obtain an encompassing understanding of the genesis, dynamics, and impacts of the complex relationships between natural systems and social or technical systems,” shaped by overall environmental issues for informed urban development (Scholz and Tietje, 2002). The case study allowed students to

gain a deeper insight into the complex problems of their site from objective and divergent points of view.

Similar the Gadamer's model, the case study is organized in three basic phases. First, students gain basic knowledge about the case through research and data collection in the "*learning and identification*" phase and then construct a working categorical list of critical aspects and principal interests for project organization. Rigorous documentation of the process is vital to the process. Second, in the "*realization phase*," interpretive understandings occur through dialogic cross-pollination (co-tutoring), as a process of mutual learning and shared interest, to develop connective modes between the complex relations of the 'whole' environmental context. Interpretative perspectives and findings are combined and collectively analysed. Finally, "*synthesis*" is performed between various interpretive and well as quantitative data, composed into a multilayered working model for the design (Scholz and Tietje, 2002).

The implemented case-study and design scenario for this project is East London's Lower Lea Valley, as it presents a complicated relationship consisting of polluted marshland and small wooded areas, brown-fields, industrial sites, refuge dumps, railway and storage, transportation lines, septic lines, flood plain regions, dilapidated buildings, housing, sports and education facilities, historic and archaeological sites, and conservation zones. Multi-cultural in aspects, the various boroughs engaged with the site have shared as well as disputed desires, each with their own agendas for their affective regions. The surrounding areas are typical English suburbs with low-income housing supported by local business and industry, which have to be maintained and connected at the perimeter of development. However, while the structure of the urban fabric is typical of the area, the socio-cultural framework is more global. Diverse eastern cultures are prevalent and with this are observed subtle urban images and language inflections. While a predominately historic and culturally structured, the areas now sponsor new, large-scale developments of the Stratford international train station and its associated commercial developments that encroach upon the local fabric and promote an immediate homogenous global connection as well as dramatic changes in scale. In addition, at the time of this scenario and part of the reason for choosing the site, the area is also being considered as the future site of 2012 Olympic facilities, a significant and radical environmental change with little regard for the localities of the place and its long-term effect.

The ciphers of critically understanding complex urban situations involve dialogically analysing, mapping, and modelling a discursive, categorical component structure through the underlying, catalysing, rationale that seeks dialectic synthesis through comparison and contrast of divergent

constructions while also forming connections for mutuality, finding shared impetuses contingent with place between varying facets of the epistemic and physical framework. Therefore, the process involved heuristically identifying varying facets of urban design into differing, even conflicting categories, using the technologies-at-hand effectively as the synthesizing tools. Diverse historiographies, contextual and social patterns, cultural manifestations, socio-economic phenomenon, technological and physical constraints and needs, long-term sustainable and conservation issues, various local particularities as well as connectivity to global, cosmopolitan concerns are filtered and then cross-pollinated to reveal new, collective re-readings of the localized urban space where all factors simultaneously come to bear. In addition, the development of the categories inevitably heads toward the periphery of other fields, as trans-disciplinary to what would otherwise be more centralized studies.

3. Learning and Identification Phase

In architectural design, as with many other disciplines involved in social interactions, it is virtually impossible to remove all individual biases that impact and influence interpretations of real situations and thus design solutions. The site is in effect the product of diverse communities and forces inhabiting it; therefore as a way to de-centralize the project, the students assumed divergent categorical positions affecting the urban design. Through these categorical units of spatial constructions, the students role-play as interest groups or stakeholders in order to promote a certain vested interest and focus in the site development, using the critical environment and the goal of comprehensive redevelopment as a common, unifying theme. The point of which is to maximize the stock of distinctly divergent constructions and points of view so that as many as possible stakeholders can affectively contribute, thus increasing complexity as well as specific focus on particular contents. This promotes a *bricolage* or 'magpie' type appropriation of divergent (and sometimes conflicting) ideas-at-hand to be integrated into a new or emergent collective work. It helps develop thicker or broader views as well as developing the possibilities of connection within and of the complex greater domain.

For management purposes, the coding categories were generalized into typical categories, but open for subcategories depending on varying levels of engagement. The initial categorical stances included: *historic contexts; mobility and transportation patterns; building density, type, and use patterns; public & private space relationships; parks, open- and green space; environmental impact and waterways; socio-economics and cultural aspects*. Similar to Kevin Lynch's *Image of the City* (1960, pp.46-49),

descriptive sub-categories included significant *paths, edges, districts, nodes,* and *landmarks* that were extended to notions of identity, connections, suitability, conservation spaces, landscaping types, names of places, boundaries, boroughs and neighbourhoods needs, among others. In addition, students were also encouraged to address these issues with sub-categories in terms of *Place studies*. In *Maintaining the Spirit of Place*, Harry Garnham (1985) recognizes three basic information systems that help "*understand, record, and communicate the basic sense of the region.*" These include: *Natural* (landforms, vegetation, water, etc.); *Cultural* (open space, land development, utility systems, public infrastructure, landmarks, circulation, etc.); *Visual* (viewpoints, unique areas, places of interaction, sequence of views, outdoor activities, visual clues, etc.). Since the cultural context is found to be diverse, extending beyond English descendents to distinct areas of Bengal, Indian, Pakistani, and others, the cultural and visual aspects become increasingly significant and viable to design interpretation. How the local inhabitants view their life-space is incorporated as an interpretive design generator.

Within the historical context, the research included urban plans of John Evelyn, Christopher Wren, and the later extreme Sir Ebenezer Howard. Studies also discussed and documented London's Olympics dating back to 1908 and 1948 as a way of placing the Olympic notion to components already in place within the overall city context. Further research also included researching names of places, historical areas of significance as well as archaeological considerations. Transportation patterns research consisted of studying types and modes of transportation including railways, main access roads, secondary roads, pedestrian walkways and walking distances, bicycle paths and water transportation and then mapping them across the site. Research also found historic pathways and nodal connections. Documentation of built structures and patterns identified an array of residential, educational, religious, governmental, industrial as well as medical on site and at the perimeters. Figure ground studies were completed as well as the study of building typologies. The relationship between public and private spaces included private and public courtyards, green spaces, public spaces that emanate a specific degree of privacy, typified London spaces, plazas, gathering areas, events-spaces, retail, mixed use buildings, multiuse spaces, combination rental and owned housing, combination business retail and housing, and visual and physical spatial transitions. Environmental impact studies pertained to sustainability and landscape and included green spaces, natural links, pathways, parks, wooded areas, environmental hazards, swamp and water run-off, climate, biological habitat, and electricity and waste management. The socio-economical and cultural

viewpoint concentrated on studying the social, cultural, demographical and economical factors pertaining to the site and the surrounding areas of impact.

In the early stages, the data is gathered and compiled using both digital and analog means ranging from literature review, census and environmental reports, web-logs (*blogs*) and web-conversations (*chat*), downloaded PDF's of site information from associated agencies, GIS metadata sets, political websites, local concerned citizen groups, city webpages, site photos and maps, etc. During site reconnaissance, students used digital cameras, recorders, and other measuring devices to document various aspects of the site. They were also asked to qualitatively evaluate aspects of the site and to talk with firms and local residents in regard to their positions. The observers discuss and diagram key aspects to their categorical stance, becoming experts in certain aspects in relation to the site that can then be conveyed to others. The computer now plays an extraordinary role in the ease and multitude of data resources and subsequent management and transfer. Multiple materials can be brought in, digitized, and mixed with other sources and interpreted collectively. The goal is to find connections that can mediate issues, while rigorously documenting in digital form as a way to make those connections quantifiable and identifiable (co-tutoring) to all involved.

The work is compiled into both analog and digital montages to promote multiple and even abstract readings within each category. Some of the initial dialog involves interpretive mental/memory mapping, diagramming, eidetic drawings and analysis to evaluate the discursive nature within the categories themselves. The students begin through typical sketching, collaging, mapping, modelling, and interpreting in terms of their specific interest, but through their readings also begin to find external connections. The interpretations are deliberately kept loose to promote generalized approaches and idealized viewpoints. The students draw into the scene qualitative imagery, poetic notions, site sketches, and photos, while identifying critical relations to associated site conditions.

The groups rigorously studied their respected viewpoints and were then asked to interpretively design specific site schemes by method of large-scale sketches and diagrams based solely upon to their primary categorical viewpoint. They draw in their sub-categorical positions into a collective, singular format. Ideological solutions, while rough in nature, are then digitized and brought into a collective scaled CAD file to be re-filtered through other points of view in the subsequent realization phase. A collective vision becomes finalized as it is digitalized and mapped to a tangible and applicable scale. Interpretation becomes literal thought-in-action as it is re-interpreted and transcribed into real substances. Composed collectively into a single database, the site develops as a multilayered and collective response, an already rich palette before the actual design is implemented. Interpretive and even qualitative modes are mapped with

quantitative site information to further bind the collective response to real world issues.

4. Realization Phase

Upon developing categories within the environment, the students work at developing common or shared threads between varying facets where the playing field can be integrated (“meeting of horizons”)(Buroway et al 1991; Gadamer, 1989). As part of this, the students are asked to identify a common goal and motivating title for the project, “*Continuous Fusion, Blurring the Lines between Divergent Perspectives.*” By identifying the complex and unforeseen nature of the site, they also identify the need to bring together the disparate facets of the environment into a systemically connective model, one that allows for future synthesis beyond their initial analysis and design and away from preconceived shape, geometry, or formal structure. Knowledge integration was intrinsically motivated by a common goal of sustainable development in the connecting medium of exchange, the urban environment as shared, ideal life-space. During this phase, participants identify others respondents that support or show consistency to their view. The validity of the design approach is grounded in the belief that a contextual reading of the site inevitably involves social agreement between various disparate facets affecting the site.

The categorical responses and subsequent master plans sketches were overlaid and merged into a collective field of spatial connectivity using two separate but connected ‘round-table’ approaches: a scaled physical site model with an overlay and a CAD modelled 3d site plan. Both analog and digital composite overlays were created to simulate, forecast and interpret direct patterns and connections between various site locations and divergent viewpoints. From this, the students visualize and discover emerging patterns as well as diversions and consistencies between conditions.

During the realization phase, a physical model was constructed of the site with a series of clear plastic overlays mounted directly over the model as a shared plane of synthesis. This plane not only fostered the collection of multiple layers into direct contact with the city fabric, but emulated a process developed by London’s Space Syntax to create computer-generated spatial, socially oriented models and to subsequently analyse their physical attributes (Hillier, 1996). This allowed comparison and contrast to the existing site model emulating the real, physical context. Lines were drawn onto the overlay that allowed for malleability and change, where lines could be easily identified and articulated in order to merge or avoid conflict. For example, a new roadway emerged that had to be accommodated and merged

with other features and was easily conformed along the lines of other components. By mixing the approaches, the design process is open to on-the-fly refining as new information is brought to the table.

The computer model is used synonymously as a mediating and substantiating device to even the playing field between divergent points of view and in turn promotes an increased 'meeting of horizons.' The use of the computer model aids in a gradual but rigorous understanding of the system, but also becomes the primary mode of intercommunicative exchange and for building design solutions. In addition, once brought into the multilayered field of the computer space, new collective readings are derived and as such promote a closer view of the complex realities of the site. Each participant now has a collective digital model, which allows all learners to see it as a single, scaled site and literal relation to real entities. It thus fosters the ability to neutralize primacy or privileging of one system over another. Commonalities are identified between facets as immediate ways to solve conflicts within the scheme not otherwise as easily identifiable until placed in a single, workable database. As design alterations are promoted, the interactive field encourages productive crosschecking of responses and thus the validation of solutions. Authority is gained only when it provides a viable 'fit' within the total field.

While interpretation was loose in the previous phase, the realization phase leads to literal interpretation and application of the data. For instance, the historic analysis, if taken literally, could simply be transcribed ideologically directly onto the site with no real connection to emerging needs. However this interpretation changes during the realization phase, with aspects of the linear connections and spatial public nodes playing an effective role when mixed with new transportation and public space analysis. In addition, an analysis of green space from London's AA promoted a similar nodal and "fuzzy network" of "emergent public space," which was digitally overlaid into the overall spatial scenario with multiple connections (Mostafavi, 2003). Public space is merged with historic models and placed within the actual transportation scheme proposed by the city. The digital model allowed for only slight inflections of these three modes to develop a context rich, new and viable fabric that moves forward while retaining an inherently deep cultural palimpsest. Other modes are then easily adapted to conform to this prevailing and connective structure.

5. Synthesis Phase

Through mutual inquiry, discursive perspectives of realities are initially discovered as divergent constructions of reality, which the evaluating participants themselves present, compare or contrast, evaluate and/or

integrate with other views presented in the dialog. These build up into co-constructions, then re-constructions, as they are articulated and evaluated by all involved, while “progressively documented” into a single connective and virtual space leading to a finalized design. Preconceived notions are also under bi-mutual scrutiny and subject to critique by all participants. This dialogic process enables individuals to act as experts to elucidate underlying ideas, issues, and theoretical perspectives (even those that are not shared) and to understand the context within which work is made. Individual constructions are re-read through others perspectives – they set conditions that dialectically generate new ideas, images, processes, and are part of new constructions that have to be integrated into an ever changing context as new ideas are merged (Danvers 2003, p.56). Interpretively mapping a rich, self-deriving context, an informing framework for their final design solutions emerges.

Beyond traditional means, the digitally oriented tools foster the ability to generate the comprehensive storage of the material and leads toward rigorous and disciplined documentation. The combination of layering systems in rendering, illustration, GIS, and CAD programs allows for layers to be named and separated for comparative or singular analysis. Clear comparative coding, attributed to categorical concepts, aids in the understanding of the various, multifaceted components, as seen in emerging information management software. The long-term goal will be to build interrelating software packages that seamlessly transfer data between varying methods and applications. In essence, combining technologies cultivates effective cross-pollination of ideas and modes through communicative and participatory interaction. Since the digital technology creates the inherent mode of a collective space as a medium of exchange. As with the CAD model, a mock full-scaled version of the site can now incorporate preliminary interpretive sketches that become ‘scaled’ and now can possess the possibility of actuality. This allows for more loose type, interpretive drawings to play the same or an even more enhanced role than it played before digital technologies. Reciprocally, the digital imagery now can retain an added level of prose and of loose content that may have been overlooked if contained to digital technologies alone. For instance, a line sketch delineating an abstract or simply diagrammed connection can now be digitally traced onto its own layer in the CAD drawing ‘as-is’ and then altered to meet specific site restraints, while maintaining the initial looseness of the gestured idea. The idea can now be simply clarified by quantitative comparison with a modelled and scaled reality. While initially simplistic in nature, if this notion is taken to a rigorous level, it has the potential to collectively overlay or montage complex patterns and thoughts seamlessly and to then merge a multitude of corresponding design configurations simultaneously. In this, the quantitative version of design can retain

qualitative, thick descriptions, and deep cultural connotations in denotative forms. The epistemic conditions for all methods and disciplines being synonymous, this notion also celebrates an intrinsic connection between traditional and emerging technological modes, linking them through the common impetus of architectonic creation (with respect to Kant) and environmental concerns.

Within our urban model, a collection of fieldwork, site and social analysis, web publications, preliminary hand sketches, interviews and presentations, photography and imagery, material and product research, consultant work, GIS data sets as well as working CAD and digital 3D models are all merged and synthesized into a single database and finalized design scheme, readily accessible and presentable to all participants, including those outside the immediate design setting. Collected work was then easily converted to transfer exchange formats for correspondence with others, as in this case international groups of architects in London that can now perform spatial analyses, assess the actual applicability, and provide critical input, thus increasing potential understanding of real-world scenarios.

6. Conclusion

“One result of formal education is that students graduate without knowing how to think in whole systems, how to find connections, how to ask big questions, and how to separate the trivial from the important. Now more than ever...we need people who can think broadly and who understand systems, connections, patterns, and root causes.” –(David Orr, ¹⁹⁹²)

Currently, modes of digital and technological means, by their very nature, are connected to universal notions, homogenized casting of the world, and globalization. As technology increases exponentially, our ability to organize and adapt must correspond or find itself disengaged from the world and thus the very epistemic structure that enables technological means in the first place. It is a change that humankind is mandated to recognize and re-organize in order to reevaluate its significance with real-world issues. With the emergence of today’s virtuality (so-called virtual-reality), both what are considered reality and non-reality are likely to have a broad array of confusing definitions. There is the increasing potential that digital technologies are displacing the user and the participant, and thus direct accountability, from what is now termed the *life-place*.

The foundations of current modes for architectural thought, especially those empowering notions of virtual or digital constructions, mirror the Greek conception of numbers and points (pure mathematics) as something separated from human experience, something separate from the world and

thus not directly engaged with our *being-in-the-world* (with respect to Heidegger's concept of *Dasein*). This experiential separation, dualistic in the philosophical sense, redirects engagement generically and homogeneously from 'alienated universalized modes of being,' not from particularized, localized modes that are by their differences transcendent and co-enabling between locales and direct experience points-of-view (Moore, 2001).

Philosophically, there is the general misconception that 'virtuality', as typically used in digital discourse, implies something 'other' than the world (non-real), a mere abstracted sphere independent and thus not accountable within real(-time) existence. This is used in lieu of the idea that the 'virtual' still retains essential *virtues*, the connections to the very-real as a basis for tethering ideas in themselves, no matter what technologies we incorporate. This concept is based on idea that the 'virtuous' (of or relating to a real force of virtue, that is, relating to strength in character or morals), is essentially something very real and very connected within the life-place. Thought of otherwise, is indeed a repeated flaw within a flaw, two circular and dualistic wrongs that never become reconciled. Our engagements with our environment are not digital (as in atomistic, separable) or 'virtual' in most usages of the word; they are embodied in the very-real life-space we all mutually inhabit (*oikos*), our environment within which we co-interact to create meaning and gain essential knowledge. But in the face of changing technology and new information, the nature of these epistemic boundaries and those of inter- or trans-connectiveness must be recognized.

There is an increasing need to foster ways in which architectural thought and thus practice (thought-in-action) can more effectively and holistically deal with complex environmental concerns. The herein stated process promotes a synthesis of communicative approaches that strengthen the central role of architects in the systemically participatory and interdisciplinary, social environment, as part of technological creation, use, and advances. Integration of common knowledge (and information) bases and distinct interdisciplinary methodologies can address the discursive concerns and their correlation with application in the community, thus developing a positive and meaningful effect with its context. Digital technologies are placed at the core of this interaction to be used as tools for complex management, but also as a way to link technological modes to the same set of epistemic conditions that are also immanent with environmental and social needs. This useful relation also reciprocally places and 'tethers' technological advances and practices within the total environment.

The goal of this process was to build a strategy for learning about the complexities of urban situations based on hermeneutic approaches. Digital technologies are used as facilitating devices for managing multiple methods and divergent modes of inquiry. Since epistemic systems exist mentally and

spatially as meaningful constructions of social interactions, an interactive approach attempts to view the context from as many different points of view and to promote a multitude of affections before a form is presupposed. That way, the informative material is already in-place as an *a-priori* set of conditions with which already rich solutions and emergent knowledge can intermingle. Reciprocally, the positive transformation of the structural framework for the communicative exchange of knowledge in turn transforms the corresponding social structure and thus critical human consciousness where knowledge, as well as technological constructions occur.

Critical Environmentalism, an idea partially founded in ethics, is not primarily concerned with universal foundations of norms or laws (*nomos*) guiding specific human thought-in-action, but is fundamentally concerned with our engaged dwelling or inhabiting within the world itself and how divergent horizons can critically and interactively co-enable each other in particular, complex situations. As a model for architectural education in general, critical environmentalism is further supported the integrative use of emerging technologies as effective means and management for essential, communicative interchange of knowledge and thus rapprochement between divergent modes-of-thought, promoting critical, productive interaction with *others* in the (co)constructive processes within a total environment, our shared life-place.

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