Experimental Design in the Cultural Space Interior Design Studio: Linear Programmatic versus Holistic Mind-mapping Approach

Diana THAMRIN[a]

[a]*Petra Christian University Indonesia*

Since its development into an independent university-based programme, interior design has drawn from the arts and engineering disciplines in the formulation of its pedagogical approach. This paper discusses interior design studio pedagogy at a private university in Indonesia, in which design methodologies in interior design studios have over the years employed the common sequential steps in design developed from architecture studios, interior design text books and professional experiences. While this linear programmatic approach has yielded logical products that could be applied to pragmatic spaces like residences and offices, they are insufficient in accommodating ambiguous and complex ideas essential in cultural spaces. This is due to their conventional forms that are results of direct extrusion from 2-d layout plans, general use of materials and appearances of being a mere "site of containments" inside the architectural frame. The paper further elaborates on the use of an alternative design method via 3-d experiments that was trialed to overcome the inhibition of creative-intuitive processes caused by the former approach. Through observation of the design process and final products of several students, it is concluded that the new method has supported a holistic mind-mapping approach in design, essential in three-dimensional disciplines like interior design, supporting creativity in terms of the novelty of forms and innovative use of materials as well as the sensitivity in connecting the interior to the architectural structure.

Keywords : Experimental Design; Creativity; Interior Design; Studio Pedagogy; Cultural Space

Introduction

Interior design pedagogy has developed from various professional design, decorative arts or architectural specialty programmes into an autonomous university-based discipline. In the process, interior design has drawn from the visual arts and other design disciplines, particularly architecture and industrial design, in the formulation of its pedagogical approach (Visher et. al, 2003: 173). In Indonesia for instance, the interior design programme is relatively a new independent discipline compared to other visual arts and engineering programmes in which a majority of interior design pioneer educators are those with background education in architecture. Professionally, much of the interior design work in Indonesia has often been undertaken by architects and contractors rather than interior designers for convenience and to minimise cost. Thus, the approach to interior design education in Indonesia has frequently had architecture as its compass and basis for design methods.

This paper discusses the design methodology used in the interior design studio at a private university in Surabaya, Indonesia, which was established in 1998 with most of its pioneer lecturers originating from the Architecture Department. The department provides a 4-year training programme for a Bachelor degree where the teaching of theory and practice in interior design are accommodated mainly through studio teaching. The core subject, Interior Design (level 1-5), that is taken from the second year till the fourth year, is different each semester only in terms of the quality of space and complexity of projects to be designed by students starting from small private spaces, residences, retails, work spaces and then moving on to larger scale and complex projects such as cultural spaces. Methodologies in design taught in the studio have over the years employed the common steps in design as detailed by Pile (1988: 467-471), starting from field and literature survey, programming (analysis and design plan), synthesis of problems, formulation of design concept, preliminary design consisting of schematic drawings of alternative designs, design development, and then the final design. While this step-by-step procedural approach has yielded fine, logical and functional products of design from students, the design products are at the same time barely novel, with fixed and defined components rather than coming out of a 'black box' that Chris Jones (1992: 46) described as expressions of high creativity and imagination that are produced beyond a designer's control. The formal approach and appearance of these designs are agreeable and rational in the sense that they can be applied functionally in pragmatic spaces like residential homes, offices and retails. However, they are insufficient in accommodating complex and ambiguous ideas essential in cultural spaces such as museums and heritage conservations that Jean Deotte (1995:35) suggested as 'a complex monad,' involving a point of view, a perspective on the whole and 'a site of passage from one epoch to another.' Similarly, Mark Pimlot's essays, noted by Lee (2009:4) on interior territory examines corporate and event spaces such as museums describing them as 'continuous, urbanised interior environments that devour the very individuality of the interior with the resulting spaces experienced as ambiguous, hybrid and typologically indeterminate.'

In an attempt to move away from the linear design approach that has been inhibiting the creative processes and outputs of our students particularly in designing cultural spaces, another design method was introduced and trialed in the interior design studio by the use of 3-dimensional (3-d) experimental design throughout the design process. The design process and final products of the top ten students who performed the new design approach were then observed using casual behavioral observation method (Guerin et.al, 2005) to assess the new method used.

The Linear Programmatic Approach

Over the years, design methodologies presented in the interior design studios have followed a specific sequence that has been developed by former lecturers who originated from the Architecture department. The design process was a sequence of phases developed from the preliminary guide book, Interior Design, by Pile, John (1988) and existing design studio methods passed down from the architecture studio as well as experiences drawn from professional work (Figure 1).
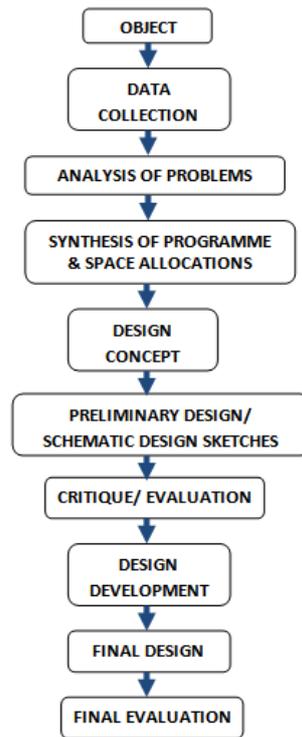
Figure 1. The linear programmatic approach of design
Source: Developed from Pile, John (1988)

At the start of the term, the head of studio discloses the object to be designed to the students: a museum, a conservation centre, an information centre, etc. The student then collects data through literature and field survey. Comparisons and connections are drawn from literature and field data and then problems in the existing designs are analysed. These problems are then met by synthesis of a new programme which determines new space allocations and zonings with specific requirements and needs. Students then formulate a design concept suitable to the programme and start their preliminary design through alternative schemes and sketches starting from area zoning and grouping, and then to the layout or ground plan with their enclosures and circulations. At this stage, the programme determined is being transformed into schematic designs similar to the graphic thinking methods by Laseau (2001: 97) as illustrated in Figure 2. Alternative 3-d views including perspectives and elevations are then sketched out from the layout plan produced.
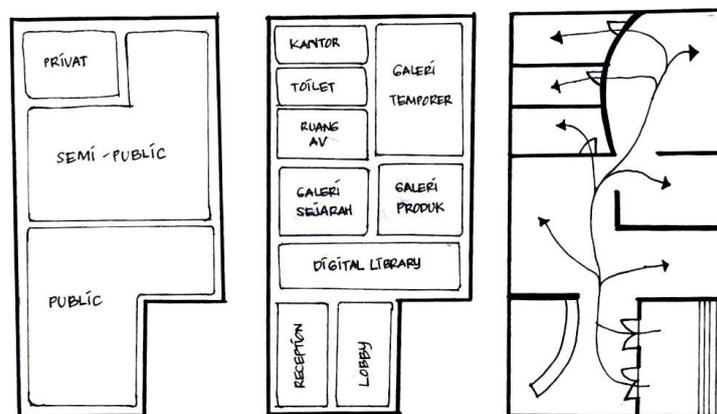

Figure 2. Initial draft of scale and shape of space followed by scheme of enclosure and construction: The linear programmatic approach of design
Source: Adapted from Laseau, Paul (2007: 97)

These alternative schematic designs are then evaluated by tutors and peers whether they are in line with the design concept and programme determined in the first place. Students then develop their design further while taking the criticisms and evaluation from tutors and peers into account until they could produce the final chosen design consisting of presentation and work drawings, concept documentation and a 1: 50 3-d scaled model.

Several problems arising from the design process of this linear programmatic approach have been observed. First, the synthesis of the programme is determined before the main design process giving an impression of fixed components and parameters that are not to be violated by students. The area zoning and grouping (Figure 2) tend to limit a large number of alternative forms of design with possible cross-zoning and heterotrophic programmes. Students feel directed to transfer the programme scheme into the layout plan rather than designing a three-dimensional space as a whole component. Second, the concept is determined before students start the design process, neglecting the possibility of creative leaps of concepts and ideas that may emerge while they are in the process of drawing or sketching. Design becomes bounded by the concept and the programme formulated prior to drawing. Thus, students tend to focus on solving one problem at a time rather than solving the global problem as a whole. Interior design elements tend to be analysed in fragments and sub-components in which the understanding of space becomes limited to floors, walls and ceilings, inhibiting a holistic approach to solving interior design problems with so many possible ways of communicating space. Third, the single use of schematic 2-d sketches in the design process is occasionally insufficient in grasping the total view of a three dimensional design discipline like interior design. 3-d presentation models are made only after the 2-d design is determined and thus seem to be used only to confirm the technical validity of the design. Little regard is given to the fact that the drawing is in some ways a very limited model of the final end product of design. The drawings which a designer chooses to make during the design process tend to be highly codified and rarely connected with direct experience of the final design. The tendency to design most frequently and initially with the ground plan as our former students did is actually a poor representation of the experience of moving around inside the building (Lawson, 2005: 27). Thus, although the linear programmatic approach in design supports analytical understanding through exploration and information gathering and analysis, it limits synthetic-holistic modes of thinking and information processing involving intuitive-inductive studio processes, events and activities necessary for a structured content rigorous process meet in design studio pedagogy described by Salama (2007: 160). Little regard is given to the fact that design students may have several different ways of being creative and solving a design problem and if opportunities for different learning styles are repressed, the studio can indeed result in a rather homogeneously-creative group of students and perhaps even in under-developed studio products (Firnando, 2007:145).

As a result, although the design works produced using this linear programmatic approach appear brand new, functional and valid for use, they are simply a visual repetition of existing designs that qualify previously regarded standards with certain modifications in space groupings and facilities as well as renovation of new yet conventional use of materials (Figure 3). Designing from the ground plan has also triggered the design of walls, furniture and other interior components to appear to be naively extruded from the 2-d layout rather than being designed with a specific message to convey from its form and space. The creation of space is achieved by simply creating enclosures whether open, visible, opaque or translucent with clearly defined program grouping and rooms as determined by the architectural frame rather than by a composition of basic design elements of line, shape and mass.
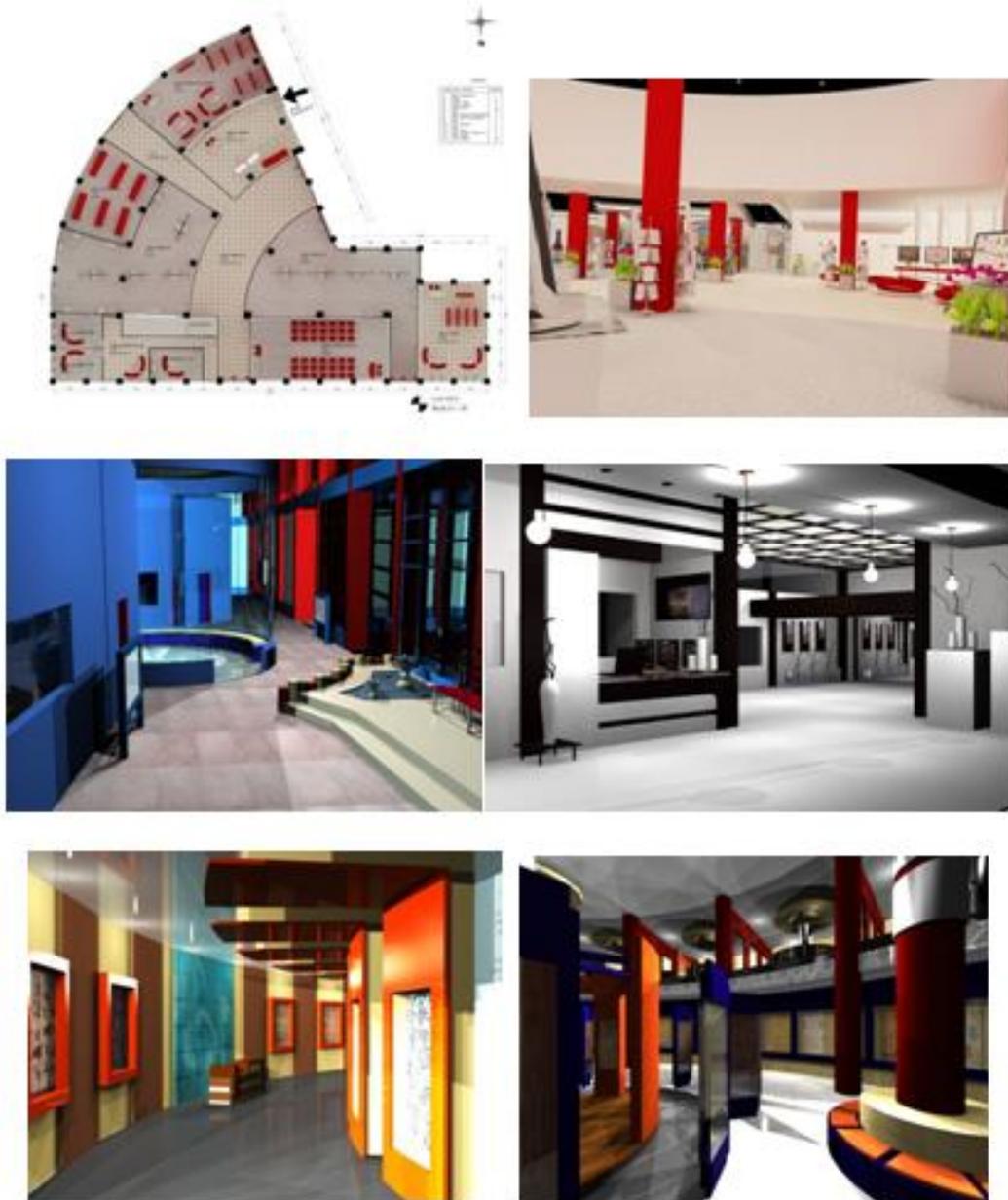
Figure 3. Former students' design products of cultural spaces following the linear-programmatic approach

Clear zonings and programme, simple extrusion of form from the layout plan and bounded by the architectural structure, as well as the conventional use of materials.

While the designs are able to solve the pragmatic needs of the users, they are insufficient in accommodating a philosophical approach or meaning in design particularly essential in cultural spaces expressed by Deotte in Lee (2009) and Pimlot (1995). In this case, the architecture of the building acts as a clear limit ground for the interior design and thus unfortunately becomes a supporting product of the notion that interior objects and decorations are often seen as unnecessary and inferior to the quality of space and function defined by architecture (Smith, 2004: 98).

The Holistic mind-mapping Approach through Experimental Design

In highly energetic and creative environments such as design studios, it is essential to provide sufficient freedom for individual expressions and explorations of

creative paths in design (Fernando, 2007: 149). An essential component of creativity is creative thinking that questions existing conditions and allows new levels and opportunities of innovative and creative discovery. Though the role and importance of research cannot be argued, it should be noted that the ability to transcend all information and to evoke memorable qualities in buildings can only be achieved by going beyond the obvious, the mundane. Design studio instructors ought to recognize this and promote a climate which fosters and supports such processes (Elseshtawy, 2007: 87-88). Thus, in an attempt to overcome the inhibition of creativity and rigidity created by the former linear-programmatic approach elaborated before, another design method was introduced and trialed in the cultural space interior design studio taken by final year students to encourage a more creative and holistic approach in the design process. In the new approach, 3-d experimental design is used as the chief supporting tool to provide a wide liberal space to accommodate a rigorous synthetic-holistic design process to support intuitive-inductive activities along with the rational deductive analytic-linear sequential procedures illustrated by Salama (2007: 160).

Although 3-d experimental designs have been used in architecture studios for years, they have never been adapted to the interior design studio pedagogy. The reason for the omission of this activity is still unclear but it is likely due to the general tendency to regard interior design as a mere "site of containment" (Smith, 2004: 95) inside the architectural frame. In this case, architecture works on form and space, interior design works on form in space. The fear of letting students conduct 3-d experiments in interior design studio is that they may forget the limits and boundaries of the architectural and structural frame. However, the author has a different view from this notion. While this fear may be regarded towards early students who are new to interior design, it should not be a crucial problem to final year students who have better knowledge and understanding of fixed building structures and who have taken building physics, building statics, building technology and construction courses. In fact, 3-d experiments can be a tool to produce more alternatives in connecting and uniting the architecture and the interior design and ensure students have a clear experience of space inside and outside the building.

Like the former approach in design, students were first introduced to the object to be designed at the start of the term and directed by tutors to collect data from field and literature survey. The differences began when the students began the process of programme analysis (Figure 4). At this stage the programme is not being synthesised and determined as an immobile parameter to the design to be produced. Instead the students were directed to follow the Problem Seeking method by Pena (2001) in which they were required to only seek the problems of the design that eventually arrive at a framework of problem statements acquired from the establishment of goals, collection and analysis of facts and determining needs by considering aspects of function, form, economy and time. Unlike the former comprehension of interior design programming in which outputs of the analysis tend to result in area zonings and enclosures that often become rigid parameters of the design to be produced (figure 2), the concept of programming in Pena's method involves 'a process leading to the statement of an architectural (interior design) problem and the requirements to be met in offering solution' (Pena, 2001). This means that the main idea behind programming is the search for sufficient information to clarify, to understand and then to state the problem. These problem statements were to be left open for solving through various alternative ways in the design later. Thus, the synthesis of the problems and the programme would be determined by the best alternative design that would be produced later.
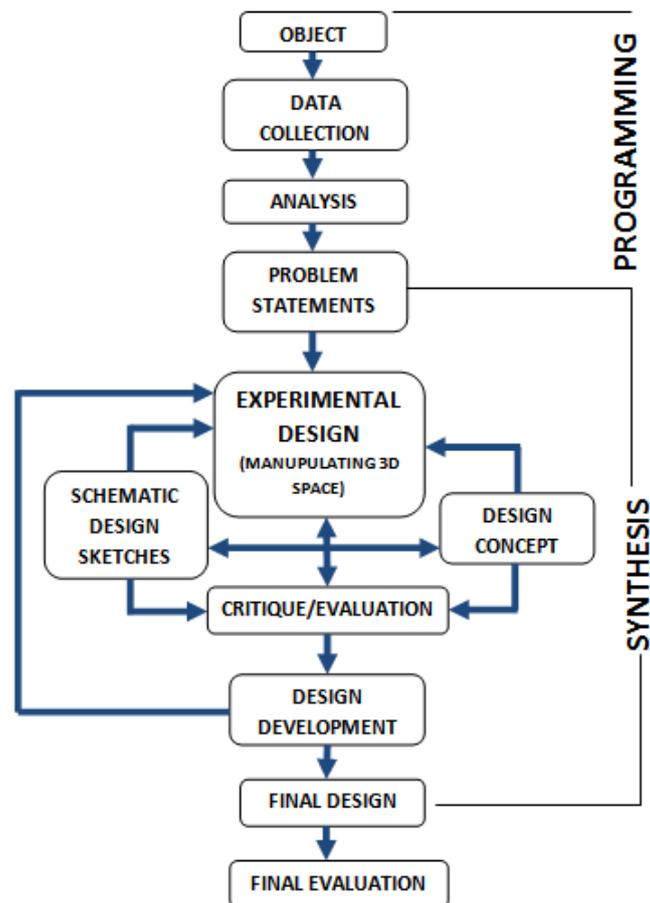
Figure 4. The Holistic Mind-mapping Approach by Experimental Design

This opened a wide liberal space for conducting experiments to be performed in the next step in the design process. The next step was a multi-level diverse process in which students conduct experiments at the same time as brain-storming design. In this stage, students were encouraged to renew and explore again the basic design elements and principles from their early years of interior design education. They were guided by tutors to perform experiments on 3-d media using practical materials such as toothpicks, sticks, acrylic and metal sheets, papers, clay, pebbles, etc, and use these materials to form a composition between the basic elements of space: line, shape, mass (figure 5) through various basic composition techniques such as interlocking, overlapping, interlacing and interpenetration taking into account the basic principles of design constituting of harmony, rhythm, variety, balance, movement, emphasis, dominance and proportion (Bates, 2000).

Figure 5. Photos of experimental design using practical materials to support a more holistic mind-mapping approach in interior design

While they were experimenting, students could also accompany their 3-d models with schematic design sketches while deciding and documenting on possible concept applications. Instead of being the sole determination to the final design, design sketches could be used to produce new graphic ideas as well as to support the experiments; to document a particular view of the design, to validate proportions, scales and measurements, to assist in conveying details necessary for future work drawings, to correlate the design concept to the experiments, etc (Figure 6). The initial design products consisting of experiment models, schematic design drawings and concept mind-mapping sketches were then evaluated by tutors and peers to determine whether the design would be able to solve the problem stated prior to designing and whether the design applications are in line with the concept formulated. Students were then allowed to choose to perform experiments and formulate new concepts again if they were not satisfied with their design or to develop their designs into the final design products consisting of presentation and work drawings, concept presentation and 1:50 scale miniature of the design.
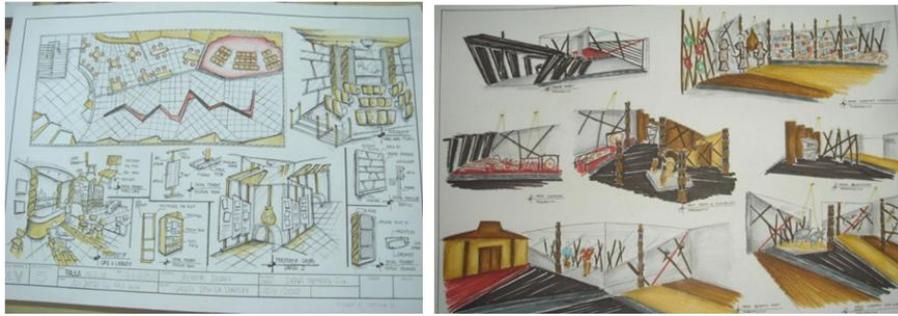
Figure 6. Photos of schematic design and concept sketches to support the experiments performed

Since majority of the products of the former linear programmatic approach were not very well documented prior to this, comparisons involving systematic scoring could not be drawn fairly and effectively. Thus, the author chose to only evaluate the design method trialed using the Guerin et al. (2005:4) method of assessment in which casual behavioral observations were made without predetermined categories and systematic scoring but rather towards a visual inspection of activities and space. This also provides an opportunity for other possible findings beyond what was expected (i.e. students were more creative). Findings from the method could be used for developing research questions and the formulation of observation categories in a more systematic approach for further research. Since every batch of students would always be divided by the studio instructors prior to the term into approximately ten groups in which each group would consist of students with mixed capabilities (each group will typically contain students who acquired A, B+, B, C and C+ in the prerequisite subject of the studio course to be taken), the top ten students (the best score from each of the ten studio groups supervised by 10 separate tutors) are presented here as results of the new approach in the observation of the final design products.

The Design Process and Results

Through examining the design process, some positive results could be seen in the adoption of this new method of approach by the use of experimental design in which the problems caused by the former linear programmatic approach were overcome. First, in the design process, unlike the former approach, the synthesis of the programme was not done prior to the design process and thus supported a wide opportunity for a range of possible alternative designs. On the other hand, experimenting on 3-d media while brainstorming concepts gives the students the ability to test concepts directly using the experiments. This supports a more mind-mapping oriented approach of problem solving encouraging a large variety of alternative programmes and designs. Second, the use of experiments on 3-d media using practical materials at the start of the design process supports an easy flow of spontaneous ideas from the brain into the media compared to 2-d sketches, in which transforming ideas are to some extent limited by the student's drawing skill and speed. Unlike drawings, these 3-d experiments are able to convey a more realistic experience of space that correlate to the design themes desired (Figure 7). This promotes a deeper understanding of the interior space which then encourages a more complex way of communicating space because creativity in interior design must be produced on the foundation that a building provides primarily an aesthetic experience to be appreciated for its holistic qualities, rather than in their fragmental qualities (Elsheshtawy, 2007: 85). Students become more creative in finding a variety of ways in creating a holistic view of space that are not limited to rigid enclosures of walls, floors and ceilings. A 3-d view of space also makes students become more aware of the actual positions, conditions and forms of basic and structural elements inside and outside the building such as structural beams, columns, staircases, natural lighting and ventilation, as

well as the interior and exterior view and thus promote more sensitivity towards the relationship and connection between the architectural structure and the interior elements (Figure 8). Moreover the ease of transferring ideas directly into interior design spaces and the knock-down nature of these experiments compared to the limited representation and modification of drawings provide students with freedom to develop their own learning styles and creative solutions. It also individualises the design process to whichever method best suits them until they are ready to produce the final products for the final evaluation, breaking chains that have been curbing intuitive and creative processes and thus encouraging heterogeneous-creative groups of students expressed by Fernando (2007: 147). The process of experimenting on practical materials also gives new insights during the design process to the way materials could be applied. When in the past materials were used conventionally in the same general function as existing or former designs, experimentation enables students to test and apply materials according to their nature and physical properties. As a result, the holistic mind-mapping nature of this design process has in turn influenced the final outputs of the designs, displaying high creativity beyond past products.

Figure 7. Photos of experiments on new forms and materials correlating to design themes to seek new ways of communicating space holistically rather than designing from the 2-d ground plan.

Figure 8. Photos of experiments enabling students to connect interior elements to architectural structures such as columns, beams, staircases and views more creatively

Observation of the final design products revealed that the top ten students who performed experiments in their design using the new approach were able to produce final design products with high creativity most especially in terms of the novelty of form and composition of interior design elements that would have potentially been inhibited by the former linear approach in design. This is because their creativity to explore 3-d space is not bounded by the limitations of 2-d drawings. New forms and interior elements can be discovered easily when exploring and experimenting directly in a holistic view of 3-d space unlike the previous tendency to design from the layout plan. The ability to test and mind-map concepts with the help of experiments along with the novelty of forms and composition can accommodate thoughts of emancipation, theme, atmosphere, transfer of one epoch to another and other artistic and philosophical aspects. This is particularly essential in inspiring cultural spaces in a more complex and ambiguous way, unlike the previous programmatic approach, in which design themes were generally direct, simple and conventional because of how interior elements were simply extruded from the ground plan. Figures 9 to 13 show some of the students' final design products using experimental design revealing novelty of forms and interior elements as well as innovative unconventional applications of materials conveying ambiguity, complexity and cultural hybrid essential in cultural spaces.

Figure 9. *Wayang* **(Shadow-puppet) Museum**
Final Design by experimental composition of traditional and modern forms and materials expressing the complex drama structure of *wayang* (Designed by Vina Kurniasari).

Figure 10. East Java Culinary Tourism Centre
Final Design by experimental abstraction of cones and Javanese *gunungan* (sacred cultural symbol) forms to represent Javanese social structure and cosmology (Designed by Fenny Margaretha).
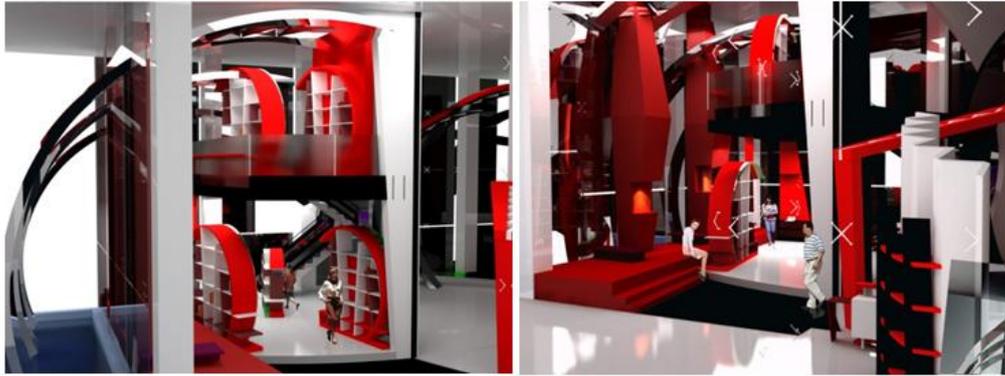
Figure 11. Indonesia HIV Information Centre
Final Design by experimental composition of curves and zigzags representing the reckless and vulnerable young generation (Designed by Seferina Dwi).

Figure 12. Indonesian Film Information Centre
Final Design by experimental abstraction of film rolls to signify cultural dynamics of Indonesian Film (Designed by Stephanie Liunardie).

Figure 13. Medicine Information Centre
Final Design by experimental overlapping of geometric and organic forms and elements to represent the richness of medicinal contents (Designed by Yuliana Dwi).

As mentioned earlier, the freedom to experiment on form also gives rise to new insights on how materials could be applied by drawing relations to the physical properties of practical materials used to actual building materials in terms of their character (flexible, rigid, hard, soft, durable, etc) as well as their appearance (textured patterns, glossy, doff, opaque, transparent, translucent, etc). As a result, the design products of the holistic mind-mapping approach by using experiments do not only reveal creativity in producing new forms and design elements as what was expected but also innovative applications of materials which contribute to the interior composition and atmosphere rather than just

being applied by general habit or function of past design standards. For example, in Figure 9, wire nets that are normally used for natural ventilation in windows as well as mosquito nets were used to create a shadowy atmosphere with some help from both natural and artificial lighting to signify the traditional shadow puppet *wayang* in a modern abstract way. Similarly, in Figure 10, when in the past metal frames were used for structural purposes; they are now used by the student as aesthetic elements that are hanged from the ceiling to convey a philosophical message relating to Javanese *gunungan* cosmology as well as dividers from the lobby and the café area.

Finally, another significant trait that can be drawn from the final design products of the students who performed experiments is the ability and creativity to create and develop new interior elements in such a way that they unite with or complement architectural structures such as columns, beams, site, and view. A 3-d view of interior space using these experiments has triggered students to possess more sensitivity towards the actual condition and position of architectural elements in relation to interior elements to be designed. Unlike the past designs, the interior elements from the 2-d patterns and motifs to 3-d furniture, accessories or dividers do not appear as "contents" merely filling up the space inside the architectural frame. Instead they appear blended and united, standing together with the architectural structure to form a holistic harmony of space conveying a message or an atmosphere together (Figure 14-18).

Figure 14. City Soccer Stadium

Development of interior elements by experimental interlocking of geometrical forms connecting the structural columns and beams with the floor pattern, furniture and display boards (Designed by Yudhie Noto).

Figure 15. Japanese Samurai Cultural Centre

Development of interior elements by experimental interpenetration of plane and mass connecting the structural columns with the floor pattern and display boards (Designed by Handoko Sindunoto).

Figure 16. Antonio Blanco Paintings Museum

Development of interior elements by experimental interlocking of forms connecting structural columns and beams to form a unity between the architecture and the interior of the building (Designed by Devi Lia Agustine).

Figure 17. *Tuban Gedhog Batik* **Gallery**

Development of interior elements from traditional *Gedhog Batik* motives, lines and forms through experimental interpenetration connecting interior and architectural composition (Designed by Susan Setiowati)

Figure 18. Aquatic Garden Information Centre

Development of interior elements by experimental compostion connecting exterior view and site to the dynamic and organic interior design concept (Designed by Yohana Mandasari).

With the manipulation of space physically and conceptually connecting the architecture and the interior, interior design thus becomes, what Smith (2004: 94-98) has described as a space of "betweenness", "blurring" and "inter-connectedness," defining the quality of spatial enclosure that is no longer bounded by the structure of architecture as well as an inferior "site of containment" within the architectural frame as produced by the former linear programmatic approach.

Conclusion

The adoption of 3-d experimental design in the cultural space interior design studio was able to yield positive results to overcome the problems exhibited by the former linear programmatic approach. It has triggered a holistic and mind-mapping approach in the design process, not only supporting creative and intuitive processes but also creating sensitivity of the physical elements and structures that could be grasped and be manipulated by the interior design field, both giving rise to more design alternatives and ways of comprehending, creating and communicating space. As a result, the final design products of this holistic mind-mapping approach by the use of experiments revealed not only the creativity in terms of novelty of forms conveying ambiguity and abstract ideas essential in cultural spaces but also innovative applications of materials as well as the ability to connect the interior and architecture of the building, thus contributing significant value to the interior design discipline.

References

Bates, Kenneth F. (2000). *Basic Design: Principles and Practice*. USA: Funk and Wagnalls.

Deotte, Jean-Louis. (1995). The Museum as the Site of Passage from Modernity to Postmodernity. In C. Davidson (Ed.), *Any Place* (p. 32-38). Cambridge: The MIT Press.

Elshehtawy, Yasser (2007). Creativity, Science and Architecture. In A. Salama & N. Wilkinson (Eds.), *Design Studio Pedagogy: Horizons for the Future* (p.75-90). Gateshead, UK: The Urban International Press.

Fernando, Nisha (2007). Decision Making in Design Studios: Old Dilemmas- New Strategies. In A. Salama & N. Wilkinson (Eds.), *Design Studio Pedagogy: Horizons for the Future* (p.143-152). Gateshead, UK: The Urban International Press.

Guerin, Denise & Dohr, Joy (2005). Part III: Research Methods (p. 1-9). In D, Guerin & J. Dohr, *Research 101: An Introduction to Research*. University of Minnesota: Informe Design.

Jones, John C. (1992). *Design Methods Second Edition*. New York: Van Nostrand Reinhold.

Laseau, Paul. (2001). *Graphic Thinking for Architects and Designers Third Edition.* New York: John Wiley & Sons, Inc.

Lawson, Brain. (2005). *How Designers Think: The Design Process Demystified Fourth Edition*. Burlington: Architectural Press

Lee, Gini (2009). Interior Territories: Exposing the Critical Interior. *IDEA Journal*, 10, 2-7.

Pena, William, & Parshall, Steven A. (2001*). Problem Seeking Fourth Edition*. New York: John Wiley & Sons, Inc.

Pile, John F. (1988). *Interior Design*. New Jersey: Prentice Hall, Inc.

Salama, Ashraf M. (2007). A Structured Content and A Rigorous Process Meet in Studio Pedagogy. In A. Salama & N. Wilkinson (Eds.), *Design Studio Pedagogy: Horizons for the Future* (p.153-166). Gateshead, UK: The Urban International Press.

Smith, Cathy. (2004). Inside-out: Speculating on the Interior. *IDEA Journal*, 5, 93-102.

Visher, Jacqueline & Poldma, Tiuu. (2003). Growing a Discipline: Evolving Learning Practices in Interior Design. *IDEA Journal*, 4, 173-184