

## Schema Theory in the Interior Design Studio

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### *Purpose*

Gallini (1989) argues that, “the ability to combine a collection of problems into a meaningful representation, or schema facilitates learning” (p. 244). More specifically, Chan (1990) reports, “that the ability of organizing and applying schemata determines a designer’s ability” (p. 78). The purpose of this study was to measure the impact and effectiveness of a conceptual advanced organizer, a database/analysis card model, in the interior design studio. The effectiveness characteristics were examined from four main areas of a design project: 1) organization of information, 2) categorization of information, 3) application of theory, and 4) overall design. The following research questions were addressed:

1. Do students, who use conceptual advanced organizers, develop design projects that are more organized than students who do not use such organizers?
2. Do students, who use conceptual advanced organizers, develop design projects that categorize information more effectively than students who do not use such organizers?
3. Do students, who use conceptual advanced organizers, develop design projects that are more theoretically-based than students who do not use such organizers?
4. Does the skill of organizing and applying schemata determine a designer’s ability?

This study utilized and analyzed the strength and capabilities of the database structure, coupled with the spontaneity and idea generation of William Pena’s analysis card technique (1977) in providing an expert-like structure for novice designers in their problem solving in the design studio.

### *Methodology*

This study was an explanatory cause/effect longitudinal study involving two separate design projects in a freshmen interior design studio course. Three groups were established: 1) students using the analysis card organizer, 2) students using the database/analysis card organizer, and 3) a no-treatment control group, where students received the traditional studio instruction. Three separate measurement techniques were used to obtain student performance and preferences—the Design Review Panel evaluation instrument (DRP), content analysis of students’ presentation boards, and the Student Cognitive Profile, which was administered after the end of Project 2. Descriptive statistical analyses, and ANOVA, Gamma, Linear and Multinomial Logistic Regression, and Paired Samples T Test analyses were conducted.

### *Summary of Results*

Results indicated that the database group slightly outperformed the analysis card group and no treatment control group with respect to organization. However, the database organizer showed larger differences between the other two groups with respect to categorization and

theory. Specifically, the database organizer was a significant aid to theory application in comparison to the control group. However, the analysis card technique when compared to the control group, showed no significant improvement. Thus, while the analysis cards were helpful to the students in organizing and categorizing, it did not assist in theory application.

In conclusion, both the analysis card and the database design resources proved effective in helping the novice designer improve their organizing, categorizing, and theory application in the design studio. In addition, it was also shown that a well-organized, theoretically-based design solution does in fact help to determine the design solution success.

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## **Engaging in a Dialogue with History through Digital 3-D AutoCAD Models**

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### *Purpose*

While computer-based analysis, modeling, and computer aided design are widely used in the fields of architecture and interior design, few Roman architectural components have been developed and few authentic Roman architectural materials have been categorized into CAD libraries for Roman architecture education and research. Designers are seeking an effective way to create modern interior spaces to recapture the spirit of classical architecture. This need strongly supports the rationale of this study which is engaging a dialogue with history through the building of digital 3-D models. Generally, 3-D AutoCAD is taught in a traditional way, which means students follow a tutorial text book and learn the software. This study explores a new pedagogy of teaching 3-D AutoCAD. The purpose of this new teaching method is to let students not only learn digital 3-D model building, but also to reinforce their knowledge of Roman architecture. The other outcome of this study is to predict the future design by 3-D computer generated models which reflect the spirit of Roman architecture.

### *Process*

#### *Field Data Collection*

To explore Roman architecture, a study trip to Rome, Italy was taken July 8 – July 22, 2004. Field data was collected in the form of digital pictures of Roman architecture and its components. Roman interior space, decorative materials, and the ruins of the Baths of Caracalla were studied intensively. In addition, freehand sketches and field measurements were recorded while teaching Roman architecture on site.

#### *Render Library Development and Pre-Test*

To categorize Roman architectural components and authentic materials into a CAD render library, digital images were imported into AutoCAD. The CAD render library was used to build a model of a portion of the Baths of Caracalla as a pre-test of this newly developed CAD render library.

#### *Course Design and Students Projects*

In the newly revised syllabus, the first project is to create a simple interior space which recaptures the spirit of Roman architecture while students are learning the basic 3D AutoCAD commands. The final project is to reconstruct a ruined house in Pompeii. The architectural components created in the previous class session are to be used in the final project. The authentic Roman architectural materials and finishes, as well as lighting design, are to be demonstrated and applied to the 3-D models.

### *Summary*

This new approach to teaching AutoCAD should reinforce student's knowledge of Roman architecture, and let students learn the digital method to reconstruct ancient Roman buildings by using 3-D AutoCAD. Through the dialogue with history while using modern technology, students not only will develop skills of 3-D model building for both new design concepts and reconstruction of ancient Roman buildings, but also will be able to create the modern interior space which reflects the spirit of classical architecture. This new pedagogy will be used and expanded through the teaching process.

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