IdeasAlive-A Way to Teach Design

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Preface

This is the first in a series of papers that present the IdeasAlive Design System. This paper introduces the system, it's purpose, information architecture, and some relevant design theory. The second paper outlines the methodology of the system and presents a detailed design guide to help teachers effectively use it in the classroom. A third paper discusses the implementation strategies and techniques involved in translating the system into an interactive learning tool. The fourth paper presents case studies of the system in use and assesses the ability of the system to effectively teach and assist design in the classroom.

Introduction to the System

The IdeasAlive Design Thinking System provides a systematic way to teach and direct design based learning experiences in 21st century classrooms. The system developed by the author seeks to provide a comprehensive answer to the questions of what and how to teach design effectively. The system is intended to enable students to emulate many of the critical thinking skills, objected oriented problem-solving techniques, and creative actions of a professional designer. By combining design process respresentations[1], the author's design theories[6] and professional practices the system seeks to provide a way for students to become engaged in a useful design methodology.

Information Architecture

The author currently uses the IdeasAlive System to structure an introductory level college course in visual design thinking. Designed to be applicable to many kinds of challenges the system provides a way to design almost any kind of inventive project. The system is presented as a kind of comprehensive "ideation" or "design" game that supports game play or visual design thinking through the integration of critical thinking[2], role playing[3], mind mapping[4], and creative drawing activities. In the design game the teacher/professor plays the role of a design manager and acts as a director, mentor, project facilitator, and design coach. Students ideally act as game players who co-navigate through five main areas comprising the game's design territory. A map of the system's information architecture is provided (see fig 0.).The names of the main Design Phases share a common first letter D to help students remember to 0) Discover, I) Define, II) Design, III) Develop, and IV) Deliver an innovative or inventive idea (see fig 0). The classroom is set up and run as a design studio as students freely choose a topic of study within their field of study or concentration area. With self motivation as key driver students are empowered to take ownership

and accept leadership roles for diverse challenges. Each project is unique and individual although small design groups of related concentration areas are formed to provide a means for students to share ideas and receive peer feedback. In our digital design studio topics of study include advertisements, architecture, animations, characters, graphics, interactive experiences, music, products, videos, and web sites.

Classroom Application

The ability to structure and practice design within this diverse pool of projects is afforded by pairs of design stages positioned within each Phase. Design stages comprise a universal design process known by the acronym -IDEASA+ and are designed to teach students to 0) analyze-, 1) Identify, 2) Define, 3) Explore, 4) Arrange, 5) Sequence, 6) Assess, and 7) synergize+ and 8) realize a comprehensive project proposal that clearly communicates project plans (see fig 0). In each design stage students are provided with a Design Stage Page that contains a pair of guided visual thinking activities (see fig 0). Design Pages are printed on 11"x17" Tabloid size paper. Both sides of the printed worksheet are used by students as the front of the page contains a template for a Design Map while the back presents a template for Design Document. The front or map side is used for rough first draft design activity. The back or design doc. side contains forms or spaces where students create the final deliverables for each stage. On both sides of the Design Page students find 7 numbered steps called design steps. Design steps take the form of visual and verbal guides that enable students to emulate the design steps often employed by a professional designer. The wording, layout, and activities in these steps are designed to promote awareness of the -ideasa+ design process. Design steps include left and right brained activation guides, visual design thinking tools, and guiding key questions that lead students to ask and answer key questions to simulate the thoughts and actions of a master designer. When combined these steps are thought to holistically use both the critical and creative power of our left and right brain hemispheres. Design Pages provide a way to teach, design, document and present the all of the stages in the design thinking system.

The integrated set of guided tool-based visual thinking activities within Design Pages are thought to provide a way to teach and develop critical thinking skills, object-oriented visual thinking techniques, and creative actions that lead to the realization of solutions with a high measure of success and predictability. Traditional design pedagogy such as training in the use of the elements of art, visual design principles, and rapid visualization drawing techniques using both traditional and digital media are also included in relevant design drawing activities. At the end of the game, design project, and course students present a comprehensive proposal for their visual design project. The Design Presentation serves as a culminating experience by which students demonstrate their knowledge of the system and show their ability to apply and adapt it to their needs. The presentation itself is both verbal, visual, and vocal as it is structured by the design process and is comprised of the main deliverables completed for each design stage. Assessment of work is based on a student's ability to define, design, develop, deliver, and present a solution by following the design process as well as upon the technical and artistic merit of the student's presentation renderings and upon the perceived value of the idea itself. Assessment is considered to be authentic as standardized evaluation criteria exists to measure technical drawing skills and illustration abilities. Assessment is also believed to be performance based as individualized project evaluation criteria is co-generated by both teacher and student directly from student

defined project objectives and performance outcomes. Students are also asked to self assesses their chosen performance criteria as well as those of their peers.

Student Outcomes

Upon completion of the course students hopefully reach the 8th Design Stage: Realization. Operating from this higher level of thinking students know and can demonstrate the clear thinking and creative behavior of a design professional. At the 8th level students demonstrate critical thinking skills, are better able to solve visual problems, have improved drawing ability and are able to design winning solutions. By providing both teachers and students with a means to practice a professional design approach the IdeasAlive System hopes to elevate the successful use of design based education practices in 21st century learning environments.

Design Phases Interface (see fig 1)

A cognitive model and 3D visual interface representing Design Phases provides a way to visually represent their combined nature (fig 1). The interface provides a visual way to describe design activity. In design Phases students 0: Discover Issues, I: Define Information, II. Design Interfaces, III. Develop Interactions, and IV. Deliver Ideas. The last phase in which students deliver ideas hints at the nature of the IdeasAlive System. It is metaphorically like an Idea Incubator. Therefore, the cognitive model, game box, or 3D visual interface for the system is egg shaped.

The empty shell of the egg represents Phase 0. The shell is metaphorically like a nurturing classroom, a protective environment, in which students are free to *discover issues* within their chosen topic of study. The blue left half of the model represents the left brain hemisphere and Phase I. The right red half represents the right brain hemisphere and Phases III. The blue color of Phase I represents the clarity of left brain thinking required to *define information* and to clearly write a project proposal. The red color of Phase III represents the kind of right brain experiential thinking and action required to *develop interactions* between an idea and it's potential users or target audience. The green sphere in the center represents a conceptual model of the idea that is visualized but not yet realized. Lastly, the small central indigo sphere is the idea itself which undergoes an incubation or ideation process until delivered. Finally, the position and shape of the three main phases I) define/blue, II) design/green, and III) develop/red suggests a clockwise or productive looping process that tightly packs or integrates a central idea. In an interactive 3D version of the design game students can interact with these surface areas to learn about the nature of each phase.

Design Process Interface (see fig 2)

Inside the shell of game is a cognitive model representing the stages of the IdeasAlive System (see fig 2). This 3D graphic interface, called the Process Interface resembles the Caduceus of Mercury (fig 2a). Adopted by the medical community in modern times this is an ancient symbol of the self, healing, and transformation. It is within and through this 3D visual architecture that ideas are transformed into mental, physical, or virtual realizations. Like the wings on the

caduceus, the blue and red crescent shapes on the process interface represent the left and right hemispheres of the brain. Like the rod or staff on the caduceus symbol, the vertical cylinder traveling through the center represents the spinal cord and the downward and inward path of a design process that seeks the center core of an idea. Like the serpents in the caduceus, the red and blue tubes represent the dialog between the left and right brain hemispheres, feedback loops, and the iterative or nonlinear tracing back aspect of design. The points at which the serpents intersect or cross are where energy centers or chakaras[1] in the body are thought to be positioned (see fig. 2b). At these theoretical intersections of the mind/body and thought/action design stages are positioned and represented as spheres or domains to portray the path of the design or problem-solving process.
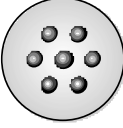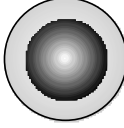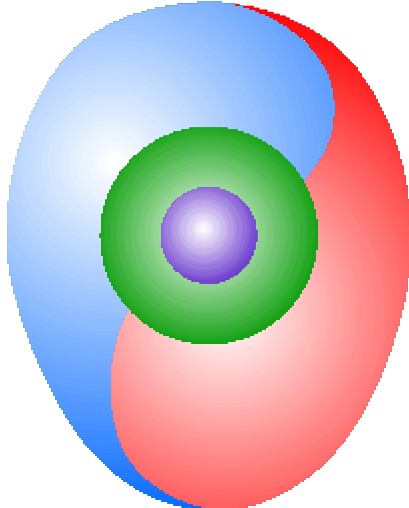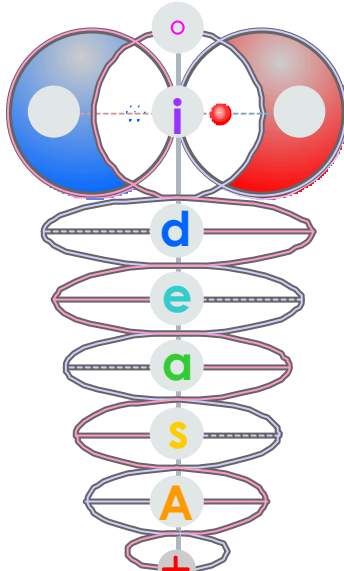
The visual representation of this design process starts at the top above our minds as ideas from the universe enter into one's center of perception. Here the left brain analyzes and sees the parts of an idea as the right brain synthesizes and sees the idea as a holistic experience. The circle at the top of the staff represents the pituitary gland or center of consciousness. Stage 1 resides at this position as a central idea is thought about and acted upon by both the left and right brain hemispheres. If the idea completely passes through stage 1 then the design process begins as the idea travels down through multicolored phases. The ideas is filtered, processed, refined, and transformed and eventually delivered at the end. The process is thought to be holographic as replicas of the process are used to produce mental concepts (thoughts), physical concrete solution (objects), and behavioral responses (creative actions). The stage colors directly correspond to the colors of the energy chakaras in an effort to mysteriously evoke and utilize their energy vibrations. The indigo chakara at stage 1 is the place ideas where are 1st conceived or imagined by the third eye. The red sphere at the end is where ideas are creatively realized, metaphorically born and become alive!

Conclusion

The goal of the author's design research is to pursue, provide, and practice a universal design thinking system that is cable of helping teachers and students devise solutions for 21st century challenges. As knowledge continues to grow and expand at an exceedingly rapid rate traditional route based learning, standardized testing, and separated disciplines will need to change if we are to truly prepare students for the challenges of tomorrow. Academic pedagogy suggests that the development of critical thinking skills, creative problem-solving abilities and interdisciplinary learning experiences offer new ways to teach and learn. The IdeasAlive system is an attempt to bring modern design based educational practices into today's classroom. The author believes that design has the potential to serve at the center of student learning and to serve as a bridge that unites science and art. Design being both an applied science and art form provides a promising way for our global citizens to develop the ability to learn how to learn and to apply knowledge to solve everyday problems, promote the human race, while creating and preserving the our built and natural environment.

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[4] chakara: A *chakra* is a whirling vortex of energy. "Chakra," in Sanskrit, meals "wheel," a wheel of light, spinning, enveloping and influencing organ systems in the body, nerve plexi, glands, and ultimately, behavior, emotions, and life enfoldment. into hormonal, physiologic and ultimately cellular changes throughout the body."

Visual Representions

Graphic	Description
Design Phases	

0. DISCOVER   I. DEFINE   II. DESIGN   III. DEVELOP   IV. DELIVER

Design | Stages

0. Analyze −   1. **I**dentify   2. **D**efine   3. **E**xplore   4. **A**rrange   5. **S**equence   6. **A**ssess   7. Synergize**+**

Fig 0 Information Architecture of the IdeasAlive System

Fig 1: Phase Interface or Idea Incubator showing design phases.	Fig 2: Design Process Interface showing position and color of design stages.
Fig 2a: Caduceus of Mercury	Fig 2b: Energy Chakaras

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