The roles of design: a new method of instructional design
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Introduction
This writing addresses the perception and activities of the instructional designer. At its core, this is an examination of beliefs, of values in the field; the questions we ask concern aesthetics, innovation, and the very nature of design. It is a theoretical investigation of our perception of ourselves as designers. "Men often define themselves through the skills they acquire, and the issues to which they put them" (Dreyfus & Dreyfus, 1986, 11). Most in the field of instructional design today would describe themselves as seeking to be either an engineer or scientist. (Visscher-Voerman & Gustafson, 2004).

We begin with addressing the current state of instructional design, which, by many accounts, is limited by its approach to design issues. Most in the field function as and seek to be instructional engineers. The driving force in instructional development often is the efficient production of instructional materials, which limits innovation. The current practice in instructional design concentrates on completion rather than quality. There is an inherent difference between design and production. Design is what happens past done; more than being a simple act of production, design is one of creation and innovation, of seeking of quality in all aspects of the process.

We will introduce a new conceptualization of the process of instructional design, replacing the worn steps of ADDIE with a series of exemplars for design practice; the instructional artist, instructional architect, instructional engineer, and instructional craftsperson. As a sequence of leaders, or as a representative design team, this "role-based" design method will encourage innovation and higher quality design.

Why has the field of instructional design failed to move forward? That is, forward with new ideas, forward with innovative methods of teaching using technology, and forward with advanced theories of the use of educational technology. We argue that the focus of the field since inception has been on lower level learning, often building work that centers on demonstrable content memorization as opposed to the more complex and advanced learning of thinking skills that is needed for the world today. As instructional designers, and in terms of learning, we aren’t rich, we’re simple. We aren’t authentic, we’re removed from context. We don’t advance; we recreate the teaching and instructional methods of the past century.

Central to this failure of instructional design is our methodology of design. Most instructional designers, when questioned about their use of a design method, have a one word answer: "ADDIE". Clark (1995) held that learning from instruction media would only change when the method changed, regardless of media. Our limited success in designing instructional media comes when we are all using the same method of design. Logically, our design will only change when our design method changes as well, regardless of the medium of our work.

Examining the revered method of ADDIE does not provide an argument for continued use. It is not an invented method for planning and designing in instructional design, but rather a description of established and vernacular practice. It appears to be first described in a number of sources as a description for what actually happens in many design fields, only later to be formalized through the literature of instructional design (Molenda, 2003).

In reality and in common use, the ADDIE models differs very little from codified design models used in other fields, notably architecture. Architects commonly use the terms schematic design, design development, construction documents, and contract administration to contractually segment the process of design and constructing a building. However, while the process can be divided into these phases (along with subsequent client billings), within good architectural firms, almost no designer limits or constrains their design activity within these steps. For example, design still occurs during construction, often adding to the value of the design. Architecture has a rich history of design methodologies looking beyond simple steps, both in terms of codification, and in terms of analysis and evaluation before and after the formal design process (often called “pre-design” and “post-occupancy evaluation”).

One can view the ADDIE model as a recipe for instructional design. Novice cooks follow recipes, without modification or extrapolation, getting the expected result (cf. Ratatouille, Bird, 2007). Completion, or done, is desired. For the great cook, however, we know that it is not how religiously they follow the recipe, but rather how
they go beyond what is proscribed. Chefs, those we need to advance the field if not our culinary experience, make use of their imagination, based on a process, but also are not hindered by it.

The process of design cannot be codified in a simple recipe in any sub-field, from graphic to urban design. Instructional design, although ostensibly following a single lockstep process, also exhibits this same diversity of method. In a study of the methods of instructional designers, Visscher-Voerman and Gustafson examined the design processes of instructional designers. Most followed a traditional, rational, ADDIE based model, but their research showed that "design processes are much more heterogeneous and diverse" than the ADDIE model suggests (2004).

Logically various variations of ADDIE have been proposed, essentially slight deviations from the standard (see for example, Gibbons, Visscher-Voerman, Hoadley & Cox, Parrish, Wilson, Reeves). Unfortunately, within these proposals, the total process isn’t changing, just a different visual analysis of the steps of design. These proposed new models include the star model, waterfall model, and spiral model, which minor changes of the process; they are ADDIE with make up.

The use of this proscribed method in teaching instructional design is understandable. Providing learners with a set of procedures to follow that is known to generate a predictable results is, to some extent, valuable. Novices in any field commonly seek a specific set of tasks that will guarantee success; however, as designers mature and address more complex problems, they generally decrease their use of a specific set of ordered actions. As noted in Dreyfus and Dreyfus (1986), novices in any field tend to seek rules and follow rule based behavior, while as an individual progresses in (design) skills, knowledge becomes less tacit, rules less explicit, and capability less defined by declared knowledge.

"During the first stage of the acquisition of a new skill though instruction, the novice learns to recognize various objective facts and features relevant to the skill and acquires rules for determining actions based on those facts and features. Elements of the situation to be treated a relevant are so clear and objectively defined for the novice that they can be recognized without reference to the over all situation in which they occur. We call such elements 'context-free,' and the rules that are to be applies to these facts regardless of what else is happening 'context-free rules'. " Dreyfus & Dreyfus (1986)

Mapped to the use of the ADDIE model, this anticipates that the higher the design skill of the instructional designer, the less use and less applicable is this model. Novice designers will use the model with fervor, evaluated on their loyal steps in the process, as (theoretically) consistent with design skill. Educators use the method as a way to codify the process and produce standardizable results.

In reality, this model perpetuates a process of design that is lockstep in execution, boring to the designer, and frontloads the "good" parts of the design process. It is a disservice to the novice instructional designer to present this method as the sole process of instructional design. Later aspects of the process are demotivating; implementation is viewed as simply getting the job done and/or drudgery; evaluation is an afterthought if remembered.

Design is, of course, never done; good designers have in their psyche an impatience, a dissatisfaction with the status quo. They seek the challenge, the unexpected result. The goal of design education is not to produce consistent designs, particularly those that replicate previous designs. The goal must be to produce better designers and hence, designs as yet unconceived. Inherent in this goal for the profession is one of constant improvement and innovation of the design process.

How this is done is an ongoing debate in most design fields, with the exception of instructional design. Most design fields recognize the value of extensive work in design studios, addressing increasingly complex design projects. However, the design studio method of remains rare within instructional design education. Within the studio and within the design process is embedded the use and application of current theory, ideology, and professional behavior.

While being a designer implies having the explicit knowledge necessary, the implicit procedures, values, and attitudes needed to successfully design must also be explicitly developed. Design can be viewed as a system of
beliefs, with expected behaviors, skills, and aesthetics. These aspects will advance the field of instructional design much more than technical or theoretical expertise.

Any design process has a series of different activities, with attention spent in various different aspects of the work. A broad understanding of the project, as well as background in the field and ability in each aspect of the work is needed. Some time must be dedicated to the experimental aspects of the work, both on specific projects and to generally advance. A rigorous understanding and evaluation of the field's body of knowledge must be applied. And the project must be implemented with skill and continuous improvement of the design, even after formal completion.

A number of theories and ideas guide the practice of instructional design, but we are also guided by our perceptions of our own practice. If we view the work of instructional design as the application of theories of cognition and learning, the inherent value is one of the learning sciences or perception, and that will guide the work. Similarly, if we view the process as simply one of the development of instructional materials, we will create work that is complete but limited. We must seek to include the full range of roles of the designer in every project, extending our self-image beyond that of the scientist or engineer.

One way to organize and present the values of instructional design is to use and emulate a series of roles as modes or exemplars for successful design practice. Being a designer, and acting as a designer, therefore, becomes more important than understanding what a designer does. Being able to be creative is much more important (and difficult) than knowing what creativity is. Presented here is a new design process, one which entails a number of "roles" instead of tasks.

Each of these exemplars of the process could also be described in a procedural tone, outlining actions that need to be taken, artifacts that need to be produced. Each will, of course, be inherently structured by sub-tasks. The process is not task driven, however, a major change will only come through changes in values, belief, attitudes and perceptions through revising our own perceptions of our work.

Roles

Instead of a recipe for making instructional design, we present a series of models for the behavior of instructional designers. There are a series of roles that procedurally will lead one through instructional design, and, more importantly, also act as a series of exemplars, which if followed, will improve quality and innovation within the field of instructional designers. We seek to make better instructional designers, not by providing a low level list of actions, but by giving the field a series of models of quality in each aspect of design work.

The roles of design we present here are archetypes, i.e., romanticized versions of real professions, exemplars of behavior and practice, which are valid as models for professional behavior in instructional design. As exemplars, we seek from them the best of their practices; for example, from the artist, creativity, and from the craftsman, patience and advancement through practice.

Each of the roles we have selected is well known through our society: artist, architect, engineer, and craftsman. Each title is often said with pride, or bestowed on another as praise. For example, describing someone as an artist denotes a creative skill with a medium, while an engineer brings a logic and reason backed by scientific knowledge. The term "designer" can also serve as an exemplar, when the full diversity of the work of design is included.

Each of the roles we highlight have been present in design for a long period of time, and most earlier design practices necessarily included all these attributes. In the Renaissance, these roles were blurred, integrated into the single individual or practice; for example, Leonardo da Vinci was artist and engineer, architect and craftsperson.

The practice of instructional design currently focuses principally on two roles, which we describe as an instructional engineer, and the other as an instructional manufacturer. Much of the field seeks the scientific, rational approach to design, where answers exist, and the best method can be found, then adopted by all, and then developed through completion.

The Instructional Engineer
We use the term "instructional engineer" as an aspect of instructional design that is most addressed in instructional design programs. The instructional engineer focuses on the applying research derived models for learning. It is close to our vision of scientist, someone seeking new knowledge through research, but here as the role is an applied one, the term "engineer" is most relevant. Indeed, some argue that the field of "instructional design" itself is mis-named: "Some object to the word ‘design,’ suggesting as it does a rather arty orientation, and insist that what we really need is ‘instructional engineering” (Shepard, 2002).

Engineering is the creative application of scientific principles used to plan, build, direct, guide, manage, or work on systems to maintain and improve our daily lives. While scientists explore nature in order to discover general principles, engineers apply established principles drawn from mathematics and science in order to develop economical solutions to technical problems.

In our model, the role of the instructional engineer is one of instructional problem solving. Most engineers, either in the instructional field or in the main fields of engineering such as civil, structural, or mechanical engineering are highly trained professionals. In education, the instructional engineer ensures a product is usable by the target audience and makes the product achieve its educational goals. Contemporary, research-based ideas are used to develop instructional materials; educational theory is an important component of the work of the instructional engineer. The principle goal of the engineer is the functional efficiency of the work, planning and organizing the project. These are valuable aspects of the design process and can advance the value of the work.

In current practice, most design completed by the instructional engineer is passed on to technicians with little opportunity for change. In any design project, at some point, the conceptualization, the planning, the broader view have been completed, and the work must be implemented. Here too there are significant questions, of a choice between completion and craft. Most instructional design work these days is manufactured; ideas developed elsewhere are implemented by workers divorced from concept, aesthetics, or theory.

The instructional manufacturer

Most materials produced in the field of instructional design are completed by an manufacturer and not by an engineer. The manufacturer frequently is a technically skilled individual applying a pre-defined design template to solve an educational problem, delivering results as efficiently as possible. The solution to an educational problem is given or dictated to the manufacturer, whose responsibility ins one of simple, recipe formatted production efficiency. Production consistency and stability are of primary importance, resulting in products that are predictable and functional. As one expects a recipe from a cookbook to be predictably good but also what was intended, one should expect the results from a manufacturer to produce consistent, but not innovative work.

For example, when asked to develop educational materials for use through distance education, the instructional manufacturer might employ traditional instructional design methods to develop instructional materials emphasizing content presentation and application. Such materials are commonly delivered to learners via the most efficient technologies (e.g., online quizzes, Blackboard/WebCT templates, PowerPoint presentations, etc.). Most of these technologies are stable and, at the core, are based on educational theories such as constructivism, collaboration, or cognitive science, but such theories are remote from the manufacturer. Models for the design process would focus on the functional (i.e. "form follows function"). As with the architecture in the 1960's, an aesthetic could develop based on making the technology work, on utility.

There are two major problems with this simplified process. First, design ceases with the conclusion of the engineering phase, and all prospects for qualitative improvement stop. The experience and technical skill that may be present with the manufacturer are seldom integrated with the scientifically based knowledge of the engineer. And second, the criteria for success of the manufacturer is one of quantity, not quality, of the number of functional widgets of pure production: Is it done? While efficiency may go up, quality does not increase.

What are the values of the manufacturer? Speed, consistency, and completion of the assigned tasks.

Contrary to the role of the manufacturer is one of the craftsperson. We seek to treat this phase of project development as critical to the worth of the end artifact; as part of the full design process. This phase is one which adds value to the project. It is needed, for the health of the process and the participant designers, that this portion of the work be a positive, additive, and generative portion of the work.
The Instructional Craftsperson

The instructional craftsman encompasses the work of implementation, but also still seeks to improve the project or design. Traditionally, craft work implies a high level of skill in execution, and while not having a focus on the research or theoretical foundations. It still has a good theoretical understanding of the field.

As a verb, 'to craft' seemingly means to participate skillfully in some small-scale process. This implies several things. First, it affirms that the results of involved work will still surpass the results of detached work. To craft is to care. Second, it suggests that partnerships with technology are better than autonomous technology. For example, personal mastery of open-ended software can take computers places that deterministic software code cannot. Third, to craft implies working at a personal scale--acting locally in reaction to anonymous, globalized, industrial production--hence its appeal in describing phenomena such as microbreweries. Finally, the usage of 'craft' as a verb evades the persistent stigma that has attached itself to the noun. (McCullough, 1998, 21)

In modern society today, we have a view, a vision of "craftsperson", one of a highly skilled trades worker doing exceptional work, a benevolent artisan. Historically, a craftsperson was a highly skilled guild member, required to take in an apprentice to continue the guild. Inherent in the role of master craftsperson was the requirement of building the work and the next generation.

One can imagine a craftsperson building a a boat or wood strip canoe, by hand. The work is comparable to manufacturered efforts, but while similar, it does not regress to the level of detached reproduction by a human. The maker, the individual is engaged with the work. To some extent, the craftsperson is somewhat isolated from concerns of reality; in their own time, patient and still efficient, the work, not the schedule is of prime importance. It's done when it's done.

Our vision the instructional craftsperson includeds a high level of implicit knowledge developed from experience. They seek quality in both technical and aesthetic terms. They value the product more than the user or client; we expect physical manifestations of their work in their lives; calluses and patience.

Most practitioners today would view the addition to or description of the final phase of their work as an easy change to the process of instructional design. Adding the title "craftsperson" to the completion phase of the work does not, however change the process. This could be window dressing, and would amount to little more than lipstick on a pig. If the craftsperson is an appendage, a renaming of the manufacturing phase, there will be no true improvement, and will have the same real impact as calling in the graphic artist to apply some aesthetics to the project. For there to be value in craft, it must have a voice throughout the design, and be a real value in execution.

The building craftsperson, the mason of the Renaissance, evolved through time to become the architect of today, as buildings are now designed. There are still masons today, focusing more on production, but as design has become more complex, and as design has separated from construction, the role of architect has evolved as separate.

Architecture is a profession that still values craft and still seeks to train new architects in the means of production. It also educates practioners in the results of research and values aesthetics and craft. This holistic view, a broader approach to the design process is applicable too to the field of instructional design.

Architects today are expected to integrate all the functions of the design process, from initial divergent conceptualization to final evaluation. Architects are current with the newest research and technologies, have the skills to work in a variety of media, and integrate the needs of the user and the client with design ideas. We view this phase(role as one which includes a broad range of responsibilities; the instructional architect holds a viewpoint that is holistic, looking across the entire project, not just within the current activities.

The Instructional Architect

We view the role of instructional architect as one that has a balanced approach to instruction design, one which values aesthetics and innovation, applied current research, and which critically examines the solution to increase
user engagement, motivation, and interaction. Instructional architects are unique in that they are not satisfied by simply solving the problem; the architect is motivated by extending the boundaries of the resources to explore solutions that enhance learner experience, moving beyond the educational and technological specifications of the instructional problem (i.e. design beyond done).

Developing an understanding of the entire project is critical to the design process; one must have a holistic view of the design challenge. Inherent in this understanding is an identification and recognition of the assumptions of the design problem, and a questioning of the design problem itself; what is the true nature of this design problem? This phase also examines the resources at hand and the theoretical and philosophical orientation of the project.

The instructional architect extends the engineer’s functional and usable solution and attempts to incorporate aesthetics at the core of the design process. By doing so, the architect explores divergent solutions that extend and cultivate the affordances of a medium. The architect’s approach to instructional design attempts to balance utility, usability, and aesthetics.

Having a broad viewpoint in the process of design is essential to a successful project, but beyond that wide view, the designer needs to specifically address the development of new ideas. In most design projects, a single driving concept is selected very early in the process. These ideas are generally pre-conceptions, ideas of what works and what could easily be done, and sadly, they are also ideas that have already been successfully executed. In order for new ideas to be adopted or even be conceived, the successful designer needs to explore many ideas; ideas that are different, unusual, that will fail or that will break the mold. In short, the instructional designer must work as an artist.

The Instructional Artist

The final exemplar is that of the instructional artist, an iconoclastic divergence that embraces experiment and failure. Here the process of instructional design examines ideas that don’t work, paths that are not expected, and allows for a more diverse range of conceptualization. Within the field of creativity training, there are a number of techniques that encourage examining wrong answers or the opposites of the expected results. Similarly, the phase of the instructional artist is fraught with failure, and one which diversifies thought. Here is where most innovation in the field will occur, not in the later roles of engineer or manufacturer, where 1% improvements are accepted as goal. The wager of the artist is to win big, with substantial increases in the value of designs, understanding concurrent risk.

Here, in this writing, we view artists as those with a mastery of a medium, with an intense focus on their work and a concern for aesthetics. They exhibit a high level of creativity, even to the point of working outside of society. Failure, unexpected results, and disturbance of the status quo mark the work of the artist; advancement of the finish product is not necessarily the goal, but is rather an advancement in the understanding and development of new ideas.

We view the role of the artist as one providing divergent thinking at the beginning of any project; providing aesthetic direction and inspiration throughout the project, and acting as the “what if” person on a project team.

The artist is an instructional explorer. The artist uses instructional problems as stimuli to experiment with media and affordances. The instructional artist may work without client or audience, only later attempting to apply to instructional practice what has been learned through the artistic experience. The artist embraces failure and engages in continuous self-criticism while attempting to understand both the problem and self.

Each role is critical at some point in the process, from the creativity of the artist, to the care and completion of the craftsperson; each serves as check and balance for the other roles, the engineer bringing the artist back to earth, the architect reminding the craftsperson of the needs of the client; and each is constant and integrated into the entire process, not taking the lead all the time, but present and engaged throughout.

Roles as process

We view these roles as generally sequential. Each role, in turn, leads the project, applying their own expertise: Artist, Architect, Engineer, and Craftsperson. This sequence is, of course, similar to many other iterations of design process, but given the use of these roles, these exemplars, each phase has it's own values and quality.
As with many other things, the methods and products of instructional design represent the values of the designer; our arguments here may be ones of belief. Present today in the instructional field is a belief that design is a purely rational and logical solution of problems, or a belief that inherent in any design must be aesthetic, spiritual, and philosophical aspects, or a belief that design must be inclusive, and spring from the ideas and actions of the learners.

Each of these roles may be performed as part of an individuals work on a design project, or they can be assigned to different parties of a team effort. They can be followed in sequence, but it must be understood that each aspect, each exemplar participates throughout the design process. For example, during the engineer phase, the sensibilities of the artist must still be present.

The Role Based Design Process can be used to organize and manage large teams or it can be used for projects designed by small teams or individuals.

Critical to the success of the process is the integration of the four design roles in the process; that artist, architect, engineer, and craftsperson are present throughout the entire sequence, although each role will take a lead in the design of a project.

Role based design process can be of value for instructional designers of all levels. For the experienced designer, a procedure for design is often in place. Applying new models or roles will help change the outlook and results. The use of a role based process will remind the experienced designer of other, divergent aspects of design methods, and serve to stimulate directed reflection as part of the process. The checklist is not used, but rather an understanding of different components of a complete designing experience.

For the beginner, use of a formalized linear design process can lead one through a challenging sequence of procedures; as artist, architect, engineer, and craftsperson; a checklist of tasks can help understand the process as well. Using Role Based Design in lieu of ADDIE will encourage an inexperienced designer to include aesthetic components through out the design process, to view the entire process as a whole; and to be encouraged to innovate as opposed to replicate design models.

Discussion

“You don’t take a photograph, you make it.” Ansel Adams (1902-1984)

Ansel Adams was lauded by many as the pioneering and visionary black-and-white landscape photographer of the 20th century. Throughout his life Adams exemplified the role of an artist by combining art, technology, spirituality, and an adventurous value for failure to capture and share visions of the American West through careful and conscious creation. He epitomized the values, philosophies, and practices of the Artist, Architect, Engineer, and Craftsperson roles; he is presented here as an example of Role-Based Design.

Adams is renowned as an artist for his stunning work, and we know that preceding that are years of experiment, trial, failure and exploration. He carried that vision of exploration without reward for many years, literally wandering in the wilderness.

Acting as the holistic architect, Adams developed the ideal of previsualization, a process of visually and conceptually exploring a scene and seeing in the mind’s eye the final photographic print before film is exposed. Lacking this exhaustive phase of holistic conceptualization, Adams believed resulting photographs would only be a product of inspired luck at best, and, at worst, shallow and unable to communicate meaning.

With a visual objective in mind, Adams, acting as an engineer, used his scientific understanding of a composition’s tonal values to capture the vision on photographic glass. After years of meticulous conceptual and technical refinement, Adams created the Zone System, a systematic approach of precisely defining the relationship between the visualized photograph and the final result, to ensure all light and dark values of a scene render effectively onto film. The Zone System has been practiced and embraced by thousands of photographers, solidifying Adams as both an inventor and educator.

Adams, a true craftsperson, is often best acknowledged for his unprecedented mastery in the darkroom. With the photograph captured on film, many photographers view the darkroom, as solely the production of a captured image
on paper. For Adams, however, the act of creation did not stop when the picture was taken; the darkroom was where the photograph is made.

Embracing Role-Based Design

In lieu of an habitual, rearticulated summary of the Artist, Architect, Engineer, and Craftsperson roles, we will sever scholarly tradition and conclude with a collection of 12 questions one can reflect upon before, during, and after each design project. The premise of Role-Based Design is illustrated in people, not steps or processes; Role-Based Design encompasses the values, mindsets, philosophies, characteristics, responsibilities, traditions, and practices of real designers.

Artist (playful experimentation)

- When listening to the initial problem, how did I freely explore a variety of aesthetic, technological, and pedagogical possibilities (rather than applying past design solutions to the current obstacle)?
- What are some of the creative, unique, simplistic, complex, innovative, and bizarre ideas I exhausted when exploring the problem?
- In what ways have I failed during my design experimentation?

Architect (holistic conceptualization)

- What are the pedagogical, technological, and aesthetic characteristics/affordances of the proposed solution?
- How does the conceptualized solution provide opportunities for transformation in learning and/or instruction?
- What steps have I taken to create an instructional experience for the learner, as opposed to an instructional product?

Engineer (scientific realization)

- What are the physical, logical, pedagogical, technological, and cultural constraints of the design and implementation?
- What structural and technical features have I implemented to ensure scalability and sustainability of the solution over time?
- What measures have I taken to ensure a reliable, valid, and pedagogically-sound solution?

Craftsperson (experienced evolution)

- Have I improved upon the design conceptualized by the architect, or have I simply developed the final product to specification?
- How have I affected the quality of ideas, processes, and production? What are 6 things I could have done better during this project (i.e. conceptual items, procedural items, and developmental items)?
- What have I learned from this project that will ensure a higher quality of design and user experience for my next project?
References


