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Comparison of Alternative Instructional Design Models

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Comparison of Alternative Instructional Design Models

An Instructional Design model gives structure and meaning to a problem, enabling the would-be designer to negotiate the design task using a process or systematic method. Models help us to visualize the problem, to break it down into discrete, manageable units. The true value of a model can only be determined within the context of use. A model should be judged by how it mediates the designer's intention, how well it can share a work load, and how effectively it shifts focus away from itself toward the object of the design activity (Ryder, 2006).

The purpose of this paper is to analyze three instructional design models, one from each of the classifications classroom, product, and system. The analysis should compare and contrast the key concepts associated with each model. Additionally this paper will identify and describe arguments against the use of ISD models in general.

Instructional Design models are classified into three types, classroom, product and system (Gustafson & Branch, 2002). Classroom models are of interest to, and are usually designed for, professional teachers from K-12, community colleges, vocational schools, and other related areas. These models take into consideration the environment of teachers. Their users may view them as a guide rather than a methodology. These models focus on the use of existing materials rather than the design of new. The output of these models is small, a unit or module of instruction used within the school year. The models also have less rigorous formative evaluation and revision than product or system models.

Product-Oriented models, prescriptive in nature, are primarily focused on creating instructional products. These instructional products may be self-study, self-paced computer based training, or other materials that can be used by a student with reduced guidance. The methodology of these models may cause them to be confused with system models, but product

models are not used to create comprehensive systems as system models are. Product development models demonstrate four assumptions: the instructional product is needed, something needs to be produced rather than using or modifying existing materials, there will be considerable emphasis on tryout and revision, and the product must be usable by learners with only facilitators but not teachers. These models are drawn upon as computer-based instruction has become more often the instructional delivery method of choice (Gustafson & Branch, 2002).

Systems-oriented models are used to develop large amounts of instruction. This can be courses or curricula and may include the development of new materials or the repurposing of existing materials. Systems models align with the ADDIE methodology, emphasizing front-end analysis and design phases. Gustafson and Branch observed emphasis on front-end analysis may result in a proposal for a non-training solution (2002). Systems models, unlike product development models, typically assume a large scope of effort.

Classroom Oriented Model - Gerlach and Ely

The Gerlach and Ely Model is a prescriptive model that is well suited to K-12 and higher education. It is meant for novice instructional designers who have knowledge and expertise in a specific context (Braxton, Bronico, & Looms, 1995). Although drawn as a linear model, many of the steps are intended to occur simultaneously. The Gerlach and Ely Model recognizes most curriculum will be designed around the concepts to be taught in each subject matter and teachers, who are forced to adapt existing materials for use in their courses (Braxton, et al., 1995).

The first step in the Gerlach and Ely process is to simultaneously specify the content and objectives. With this model intended for K-12 teachers, these combined steps recognize that teachers know the content or think of content first, then define the objectives for that content. The objectives do need to be defined, however, for use in the next steps of the model.

The second step is to specify the entry point of learners, which for K-12 teachers may simply mean reviewing existing records. The third step is to perform five activities simultaneously: (1) determine strategy, (2) organize groups, (3) allocate time, (4) allocate space, and (5) select resources. The key is to determine which combinations will best allow the students to meet their objectives. The Gerlach and Ely model emphasizes using existing instructional materials rather than develop new materials.

After these simultaneous decisions are made, the next step is evaluation of performance. The teacher should determine what observable or measurable changes occurred in the students and if the observations can be attributed to the instruction. The model concludes with a feedback loop to determine the effectiveness of the instructions so changes can be made as necessary.

Product Oriented Model - Bates

In 1995, Tony Bates presented a model for developing open and distance learning. Bates realized digital communications were going to be used more frequently for distance education. Early in his research, he acknowledged the fact that there are inherent limitations of distance education. Bates created a framework for selecting learning technologies which is still relevant today. The organizing framework that Bates proposed is called ACTIONS, which stands for access, cost, teaching and learning implications, interaction, organizational issues, novelty and speed.

Bates's model has what he calls a *front-end system design*. A front-end system design has four phases: course outline development, selection of media, development/production of materials, and course delivery. Within each phase, Bates has properly identified the team roles and the actions or issues to be addressed. Bates readily admits he borrows heavily from the ADDIE model from which he derives many of his ideas. One of the reasons Bates may have felt

compelled to create an additional model to ADDIE is because ADDIE has been widely and often criticized for being too systematic. ADDIE is often said to be too linear, too constraining, and even too time-consuming to implement with regards to e-learning. While Bates may have been making an attempt to simplify ADDIE, he cautions course design may take as much as two years.

One of his main concerns, prompting the development of ACTIONS, was the way face to face course material was adapted for web or other distance learning approaches. Bates feels the traditional remote instructor concept is nothing more than face-to-face instruction without direct interaction. Bates also states these specific scenarios often fail to take advantage of the unique benefits that are available through the specific technology being used.

Additionally, in his 1995 book, *Technology: Open Learning and Distance Education*, Bates details cost analysis when designing distance or e-learning solutions. If his design and evaluation methods are followed, one would easily be able to determine the effect each dollar spent on this e-learning solution has had on a given student. This can be particularly useful when dealing with fiscal management issues.

The Bates Model provides the user with a plethora of tools and ideas, each of which will be useful for designing e-learning environments. The model is broken down into four distinct groups. Each group is replete with projects and assignments.

System Oriented Model - Gentry IPDM

Castelle Gentry explains his model of Instructional Development in the course of a textbook. Gentry named his model the Instructional Project Development and Management (IPDM) Model. The IPDM model was born as a result of five conclusions Gentry made with regards to instructional design. The first conclusion admonishes introductory instructional design

textbooks for not adequately linking relationships between instructional design processes and their supporting processes (Gentry, 1994, p. ix). The second of Gentry's conclusions says introductory instructional design textbooks should teach both what and how to "do", in other words "practical means for accomplishing specific tasks" (Gentry, 1994, p. ix). The third through fifth conclusions set a basis for Gentry to develop a generic Instructional Design model as a survey of instructional design processes, supporting processes, and techniques.

The result IPDM Model is has eight development components, defined by Gentry (1994) in a non-linear diagram.

1. *Needs analysis* - establish the validity of needs and goals for existing or proposed instruction
2. *Adoption* - establish acceptance of an innovation by those affected and obtain a commitment of resources.
3. *Instructional Design* - determine and specify objectives, strategies, techniques, and media for meeting instructional goals.
4. *Production* - construct elements of a project, as specified in a design and revision data.
5. *Prototyping* - assemble, pilot test, respecify, validate, and finalize an instructional unit.
6. *Product Installation* – establish the necessary conditions for effective operation of a new instructional product or process.
7. *Ongoing Operation* – maintain the continuing application of an instructional product and/or procedure.
8. *Ongoing Instructional Unit Evaluation* – collect and analyze data about an ongoing instructional unit to make decisions about future revision.

The development components have five supporting components, defined by Gentry (1994, p. 5):

1. *Project Management* – control, coordinate, and allocate resources.
2. *Information Handling* – select, collect, organize, store, retrieve, distribute, and assess information required by an ID project.
3. *Resource Acquisition and Allocation* – determine resource needs, formalize budgets, and manage resources.
4. *ID Project Personnel* – determine needs for staffing, training, assessment, motivation, counseling, censuring, and dismissing ID project members.
5. *Facilities* – organize and renovate spaces for design, implementation, and testing of elements of instruction.

The development and supporting components are linked by information sharing between the two clusters for the duration of the project. Gentry designed his model to show instructional design is not a linear process.

Model Comparison and Contrast

When doing the comparison between Bates, Gentry and Gerlach/Ely's models, it was noted that all three models allowed for some variation in implementation; it would not be incorrect to modify the order of the steps depending on the settings of the instructional situation. This is especially true for the Gerlach/Ely model. The three models we have chosen to review all were published between 1994 and 1995.

The Bates and Gentry models both rely heavily on front end work. This means that the model assumes that step one will involve an extensive needs analysis. The information learned from the analysis will be crucial in the next phases of the design. In particular, the Gentry IPDM model is best for large scale projects, as demonstrated by the communication core of the model. Both Bates and Gentry also provide a framework for helping the designers determine the overall

cost of the solution. This may include the cost of the technology needed for implementation. Bates and Gentry are also very good at providing personnel assignments for each phase of the design. This allows the designer to determine, up front, the type of personnel that will be needed throughout the design and implementation.

The main strength of the Gerlach/Ely model is practicing classroom teachers can identify with the process it suggests. The Gerlach/Ely model allows for a novice instructional designer whereas Gentry and Bates need some design expertise to perform front-end analysis. As a result, classroom teachers might be more likely to apply Gerlach/Ely. The Gerlach/Ely model differs from the other two by emphasizing existing content as the basis for new instruction. Basing new instruction on old content by forgoing front-end analysis may unintentionally reinforce traditional learning teaching patterns rather than promoting a re-examination of best practices in classrooms.

Instructional Designers cannot be effective if they are familiar with only one model. The designer must be able to fit the design to the situation and familiarity with various models will make that designer more successful. Analyzing various models demonstrates that although the models had differences, combined steps in various ways, or used different vocabulary, they shared a fundamental principle of attempting to deliver effective learning or educational tools.

Arguments Against Instructional Design

In an article published in Training Magazine in April 2000, Jack Gordon and Ron Zemke lay out arguments against the use of ISD models. The article was the catalyst for a plethora of rebuttal articles, white papers, and seminars on why ISD is not dead and is still useful and relevant to the field (Clark, 2004). The arguments in the original article were:

- ISD is too slow and clumsy to meet today's training challenges
- There's no "there" there
- Used as directed, it produces bad solutions
- It clings to the wrong world view

Rebuttals concentrated on the question: Is it ISD that's flawed, or the manner in which it is applied that is the problem (Zemke & Rossett, 2002)? To address the argument of ISD being slow and clumsy, Sivasailam "Thiagi" Thiagarajan conducts workshops in "Rapid Instructional Design" which includes strategies and design elements to move more quickly through the ADDIE phases and to use partial processes where appropriate (Thiagi, 1999).

Argument two discusses the use of ISD as a "technology" of instruction. Project management for Information Technology (IT) projects is seen as a science. Yet IT project management is an art as is Instructional Design. IT project management has addressed similar flaws in waterfall or linear project management processes. Additional project life cycles have been introduced in this discipline. These models, selected based on project and environmental factors, include: incremental or prototype based methodology, Barry Boehm's Spiral Model, and the Rush to Base Evolutionary Model (BU, 2005). Options such as these applied to ISD would allow for the flexibility and rapidness desired for delivery of an instructional solution.

The third argument is that following ISD models will produce bad training. Clark (2004) discusses how the "A" of ADDIE was never meant to stand for Performance Analysis and that Instructional Design should only begin once it is determined training is the solution to the problem.

Charge 4 assumes ISD jobs have a set of best practice procedures that must be taught to students who are not master performers. Saul Carliner suggests we should remember ISD is a

value system that must be applied appropriately and all ISD needs is re-tooling for all the new ways of learning we see since ISD was first proposed more than 50 years ago.

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