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The Origins and Descriptions of ADDIE

According to Tufts University, ADDIE stands for "Analysis, Design, Development, Implementation, and Evaluation" five steps in a process used to design instructional programs "for any level of instruction (lesson, course, curriculum) or for the design of any kind of instructional material (web page, simulation, handout, PowerPoint slide)," (Tufts, 2007, pp.1, 4). Several universities, including Idaho State University, Brigham Young University, and Tufts University promote the ADDIE model to instructors for designing courses, especially web-based programs. Who created ADDIE? How is ADDIE applied to instructional design? What are the pros and cons of using the ADDIE process?

The creation of ADDIE is ascribed to several individuals and programs. Molenda (2003, p.1) discusses how ADDIE is often described as "the isd model" and states:

> The "ADDIE Model" is a colloquial term used to describe a systematic approach to instructional development. The term is virtually synonymous with instructional systems development (ISD). The label seems not to have a single author, but rather to have evolved informally through oral tradition. It is not a specific, fully elaborated model in its own right, but rather an umbrella term that refers to a family of models that share a common underlying structure. ADDIE is an acronym referring to the major processes that comprise the generic ISD process: Analysis, Design, Development, Implementation, and Evaluation.

Molenda goes on to research the various legends of ADDIE's origin, including its possible associations with Florida State University and education researchers who partnered with the United States Army and finally concludes:

> One of the few explicit narrative references to the ADDIE Model in the academic literature of the field is found in Molenda, Pershing & Reigeluth (1996). The ADDIE Model is also used as a major organizing principle in Gustafson and Branch (2002). Neither Molenda, Pershing, and Reigeluth, nor Gustafson and Branch provide any citation for their references to ADDIE. […] these authors are essentially creating their own interpretations as there does not appear to be an original, authoritative version of "the ADDIE model" (Molenda, 2003, p. 4).

Other sources, including Tufts University, Idaho State University, Brigham Young University, and the Learning Theories Database do not assert an origin for ADDIE and have slight differences among their descriptions of the process that support Molenda's conclusion that ADDIE is a prime example of "cloud" development where many researchers and user informally collaborate and contribute to the creation of a product, idea, or process.

The lack of explicit progenitors does not prevent ADDIE from being commonly used to design instructional programming and as the basis for over one hundred

instructional design models (Tufts University, 2007, pp. 5-9 and Learning Theories Knowledgebase, 2011, pp.1-6). A Google search of ADDIE Instructional Design shows that Colleges and Universities, public schools, dining programs, corporate trainers, public and private instructional programs all use ADDIE or some version of the ADDIE Instructional Design model to develop programs, course, and curricula. As noted previously, there appears to be a trend to use ADDIE to design online programs for higher education and corporate training. The explantion of the model is not, as noted previously, uniform. The following chart (figure 1) can be used to compare the definitions from several sources:

Step:	Learning Theories	Tufts University	Brigham Young
A – Analyze	During analysis, the designer identifies the learning problem, the goals and objectives, the audience's needs, existing knowledge, and any other relevant characteristics. Analysis also considers the learning environment, any constraints, the delivery options, and the timeline for the project. (Learning Theories Knowledgebase, 2011, pp. 3)	The analysis phase involves gathering information to inform decisions about instructional strategies, media and technology, and evaluation of the success of the design. Instructional Goals – What are the general goals for the learner? Learning Outcomes – How will you know if the learners have met these goals? What changes in performance, knowledge, attitudes, and skills will be observable and measurable? Learner Characteristics – What prior knowledge do learners have? What are their learning goals and motivation for engaging with the instruction? Learning Environment – What physical classroom constraints may affect the design of the instruction? Project Management – What time, resource and staff constraints affect the successful implementation of the project? (Tufts University, 2007, pp.5)	Analyze three important areas: - The business goals you want to achieve - The material that must be taught - The learners' current capabilities - Discover any existing materials - Define measurable business goals - Conduct an instructional analysis - Analyze learners and contexts Write learning objectives (Brigham Young University, n.d., p. 1)
D – Design	A systematic process of specifying learning objectives. Detailed storyboards and prototypes are often made, and the look and feel, graphic design, user-interface and content is determined here (Learning Theories Knowledgebase, 2011, pp. 4)	Design instruction by answering the following questions: Task design – What are the steps the learner is expected to follow to accomplish a specific task? Information design – How much content will be presented and how will the design draw attention to important information? User interface or graphic design – What will the handout, Web page, or PowerPoint slide look like? How easy is it for learners to use? (Tufts University, 2007, pp.6)	There are basically three steps in the instructional design phase: Plan the instructional strategy Select the course format Write the instructional design document Questions to answer: How should content be organized? How should ideas be presented to learners? What delivery format should be used? What types of activities and exercises will best help learners? How should the course measure learners' accomplishments?

			(Brigham Young University, n.d., p.9-10)
D – Develop	The actual creation (production) of the content and learning materials based on the Design phase. (Learning Theories Knowledgebase, 2011, pp. 5)	This phase involves the actual creation of any "deliverables" such as a Web page, handouts, PowerPoint slides, or online activities that will be used with learners in the first implementation. (Tufts University, 2007, pp.7)	A successful development phase draws upon the information collected in the needs analysis phase and the decisions made in the instructional design phase. Steps: Create a prototype Develop the course materials Conduct a tabletop review Run a pilot session (Brigham Young University, n.d., p.14-15)
I – Implement	During implementation, the plan is put into action and a procedure for training the learner and teacher is developed. Materials are delivered or distributed to the student group. After delivery, the effectiveness of the training materials is evaluated. (Learning Theories Knowledgebase, 2011, pp. 6)	This phase of the process describes the first use of the instruction or materials with learners. Ideally those involved with the design and development of the instruction and materials will be able to continue to follow the project once it is implemented with actual learners. (Tufts University, 2007, pp.8)	The ADDIE model provides a systematic methodology to plan, develop, and test the course before it launches. Implement the program when: The course meets important business/organizational goals The course covers content that learners need to know The course reflects the learners existing capabilities (Brigham Young University, n.d., p. 19)
E – Evaluate	This phase consists of (1) formative and (2) summative evaluation. Formative evaluation is present in each stage of the ADDIE process. Summative evaluation consists of tests designed for criterion-related referenced items and providing opportunities for feedback from the users. Revisions are made as necessary. (Learning Theories Knowledgebase, 2011, pp. 7)	During this phase evaluative feedback on the effectiveness of the instructional design of the lesson, course, curriculum or materials in meeting the original instructional goals and learning objectives will be gathered. If the feedback meets the expectations and goals for the design, then it can be considered summative or final. However, based on this feedback, revisions in the design may be necessary. (Tufts University, 2007, pp.9)	The ADDIE evaluation phase provides a final review checkpoint for the project. During the evaluation phase, the training specialist measures how well the project achieved its goals. Here are just some of the questions that might be explored during the evaluation phase. Do learners like the course? Do learners achieve the learning objectives at the end of the course? Do the learners change their behaviors in the workplace? Does the course help the department achieve its business goals? (Brigham Young University, n.d., p. 20)

(figure 1)

One of the benefits to using the ADDIE design process is that the model calls for continual evaluation, much like the strategic management, continuous improvement, and monitor and adjust/backwards design models commonly used in business administration, manufacturing, and education, respectively. Additionally the ADDIE model is flexible and can be scaled to apply to designing instructional materials in various media formats, for varied audiences, and at varied levels of complexity: an assignment, a book, a course, or a degree program. Finally ADDIE design models come

in many different iterations based on a basic principle of effective evaluation and application. Unfortunately this flexibility and seeming simplicity can also be a negative aspect of ADDIE because an inappropriate application of the model can be easily found and quickly implemented with disastrous results. Additionally the wide variety of ADDIE models can lead to confusion, and the slight differences in each may make it difficult to select an appropriate model to follow. Once a model is chosen, it may be too detailed and complex or the processes within the stages may not suit the program to which the model is being applied.

The most noticeable differences between descriptions of ADDIE are shown between educational and business applications of the model. The analysis phase in the business model addresses objective of the instructor, student, and organization which may even be competing rather than complimentary interests. The development phase in the business model includes a review or evaluation process that is not included in the education models and reflects the fact that the ADDIE process may include product design and review as well as content and instruction design and review. Moreover in the business model implementation phase elements and evaluation more closely tied to the development phases of the education models are included. Finally the evaluation phase of the Learning Theories Knowledgebase specifically includes formative and summative assessment whereas the idea that revision – the purpose of formative assessment - is necessary appears to be added as an afterthought to the evaluation phase discussed by Tufts University and the Brigham Young Dining Services model.

The Brigham Young University ADDIE description is used in a business training application by the dining services division of the university. The model is therefore more business oriented, focusing on resources and results. The document detailing the ADDIE process is written in a simple straight forward manner with detailed explanations that makes it useful for the context for which it is specifically designed. ADDIE models used in education, or prepared for a broader audience, tend to focus on an understanding of the design process and how pedagogy, methodology, and technology combine to meet educational objectives and are somewhat less focused on future applications of knowledge than on effective transmission, where as business models specifically address business goals outside of the acquisition of knowledge. These differences relate directly to the differing initial objectives of instruction in each case; ADDIE is a tool that can be modified to fit a specific purpose for a specific entity.

In conclusion, the following summary description of each ADDIE stage may be helpful:

Analyze: Define and prioritize the objectives of the program or course and the physical, instructional, technological, and interpersonal limitations that apply to implementation of the program and develop a method of evaluating success in meeting the objectives. Design: After evaluating the analysis, design and plan content that will provide learning opportunities that utilize effective methodologies while staying within the limitations of the program. Develop: Create content in appropriate media. Implement: Using developed content, carry out the instructional plan designed earlier. Evaluate: Using the evaluation methodology and criteria created in the analysis phase, assess the success of the program in meeting the initial objectives, and determine areas and revisions to improve. As long as each of these elements exists there is an increased likelihood of

successful design and implementation of an instructional program.

References:

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