Blueprints for Instruction

University of Texas at Brownsville, EDTC6321

By: **Juan Garcia, Raymond Kiser, Patrick Moseley,**
Annabel Nieto, & Christie Rickert

Introduction

   Everyday, teachers and trainers walk into a classroom with hopes of inspiring their students to learn something new. Just as an architect should not begin building a home without a blueprint, a teacher should not start instruction without thoughtfully designing the instruction. The preparation to design instructional activities greatly affects the outcome; therefore, utilizing an Instructional Design (ID) model will maximize the effectiveness of the instruction. The following research and multimedia presentation summarizes and compares the ADDIE and Kemp ID models as well as provide an instructional design example depicting each. The ADDIE model provides a structured design tool whereas the Kemp model allows an experienced designer to adapt the instructional design process.

About the ADDIE Model

   The ADDIE method was developed in the 1970's by the Center for Educational Technology at Florida State University (Clark, 1995). After World War II, the military needed an effective way to develop training which is why this model emerged. This instructional design model is a simple, linear, 5 step process. The acronym, ADDIE, stands for Analysis, Design, Development, Implementation, and Evaluation. There are over 100 adaptations of this commonly used model, but the basic process is depicted below. (Castagnolo, 2007).

Figure 1:
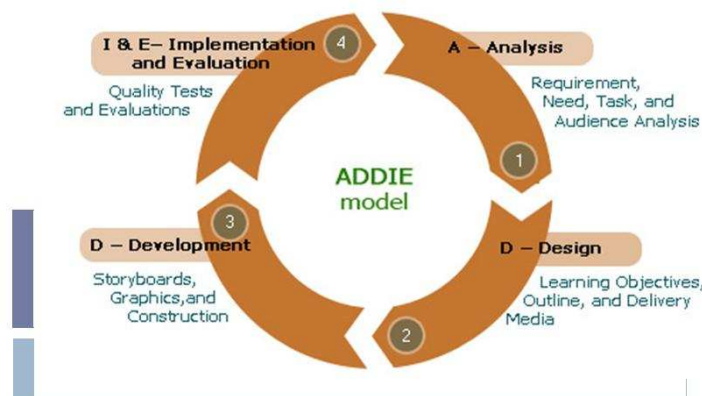Our approach. (2009). Retrieved July 18, 2010, from www.learningleaf.org/approach.html

Following the ADDIE Method, a Designer will take the following steps to design instruction:

Analysis:

Identify the learner's needs, prerequisites, and performance objectives. The learning environment, and timeline for the project are also considered (Castanolo, 2007).

Design:

Further solidify the instructional goal, sequence of instruction, delivery mode, and the evaluation instruments. A designer usually develops storyboards or models at this phase. (Learning Theories, 2010).

Development:

The instructional designer begins developing the training materials including the student and teacher resources. (Learning Theories, 2010).

Implementation:

Delivering of the instruction to the intended audience takes place. Impelmentation and Evaluation can occur simultaneously (Castagnolo, 2007).

Evaluation:

The instructional designer evaluates the effectiveness of the training developed and makes revisions based on feedback from users (Learning Theories, 2010).

Like any instructional design model, there are strengths and limitations of the ADDIE method. A designer may choose this method because it is straight forward and the steps are easy to recall. The structure of the model includes only 5 steps compared to 9 or more in other models. As technology has evolved, some critics believe that the process does not allow for the integration of digital technologies which allow for less linear models of instructional design. There are also debates that the ADDIE model is in fact not a model at all, but rather a conceptual framework defining the design process as a whole (Bichelmeyer, 2005).

ADDIE Model Example

The following lesson was designed using the ADDIE model. The instructional objective is for students to identify phases of the lunar cycle and order the 8 phases of the moon.

Analysis	The students are a regular education 3rd grade class. They have been introduced to the moon in previous grades. They are about 7-8 years old and come from a bilingual background. The lesson will be delivered through a power point lesson which contains pictures of the different phases of the moon. The teacher will be using the teacher computer, Smart Board, and projector. The lesson will last approximately 30 minutes.
Design	The instructional objective is for students to identify phases of the lunar cycle and order the 8 phases of the moon. They will be to identify the eight phases of the moon and put them in the order they come in during the lunar cycle. Students will be taught the eight different phases of the moon in a power point presentation using the smart board and projector. Each slide will be in the order of the lunar cycle, the first slide will have a picture of the first phase and the name of the phase, followed by the rest of the phases in similar fashion. The last slide will have all the phases of the moon in a circle the way the moon appears relative to the sun. Then the teacher will open a smart board lesson with just the pictures of the phases of the moon. The students will then identify the name of each picture. Using the interactive smart board, the students will place the phases in the order they belong in the lunar phase.
Development	A power point with the pictures of the moon, as well as a template for the Smart board lesson, will be developed.
Implementation	During this phase, the design and development are put into action. The teacher will assess what works, what doesn't work, and what needs to be improved. Consider how the lesson can be changed to be more effective and make revisions.
Evaluation	The evaluation is an ongoing process. The effectiveness of the lesson is measured by whether the learning objective was accomplished. How can the lesson be improved for future students? Was the content accurate?

About the Kemp Model

The Kemp Model is a well known instructional design method used to creating effective instruction. This model was developed by Morrison, Ross, and Kemp to provide a holistic approach for developing instruction (Hanley, 2009). Figure 1 depicts the version of this model which was revised in 1994 (Gustafson, Branch, & Eric Clearinghouse, 2002).
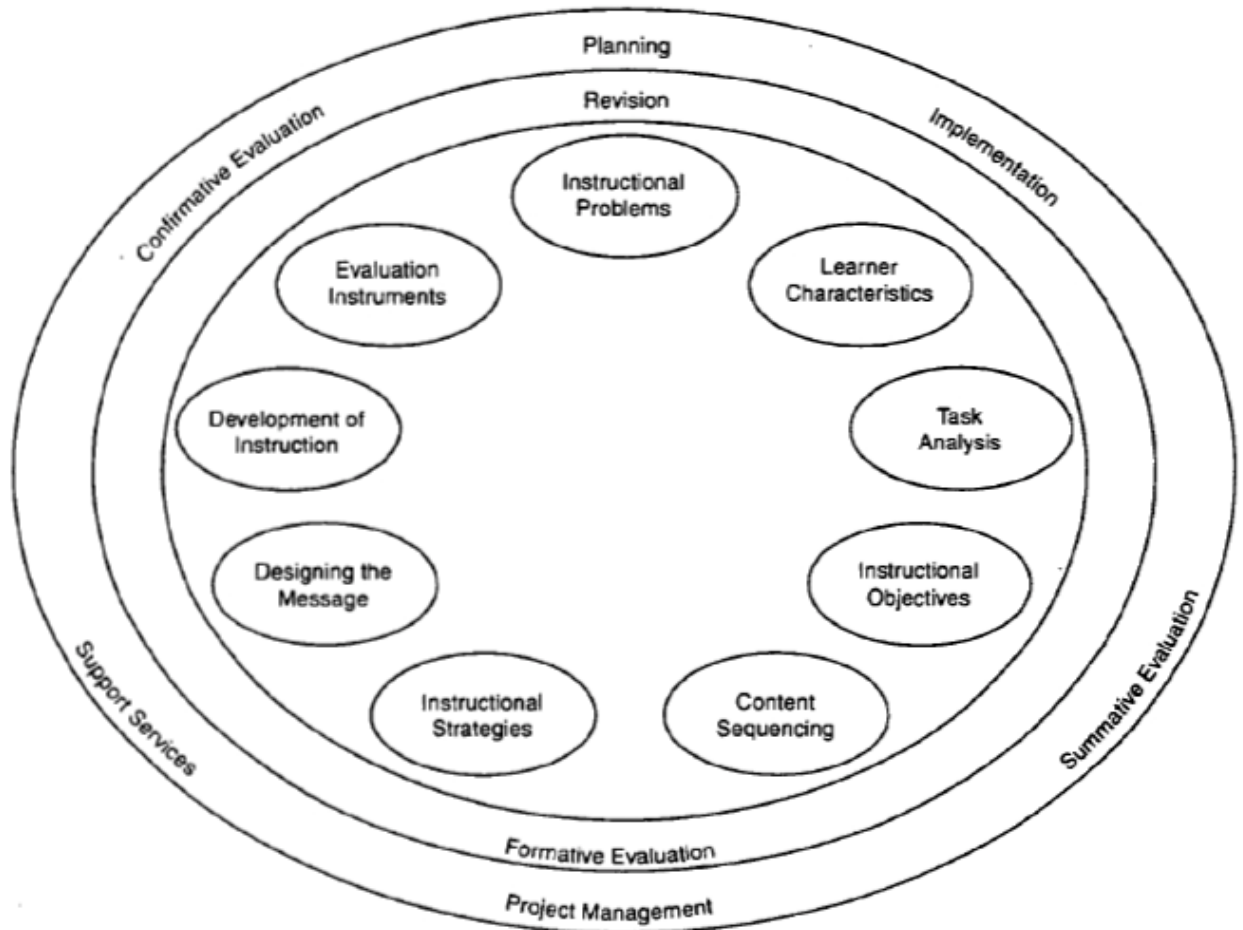

 Figure 2. The Morrison, Ross, & Kemp Model (Gustafson, Branch, & Eric Clearninghouse, 2002, p.47).

 Notice in the diagram that the model is a continuous circle, with no specific beginning point, meaning that the nine elements are mutually supporting. This model suggests a less rigid approach to the instructional design process, allowing the experienced designer to use personal judgment regarding where to begin the process and which steps are necessary to solve the instructional problem (Akbulut, 2007). The steps may be performed in any order either independently or simultaneously at the discretion of the designer (Gustafson, 2007).

The interaction between the steps makes this model a good choice for a project where multiple team members are working together to complete the instruction (Akbulut, 2007).

There are nine elements in the center of the process which Morrison, Ross, and Kemp believe are essential for effective planning (Gustafson, Branch, & Eric Clearninghouse, 2002).   In no particular order, an instructional designer following the Kemp model would:

1. Identify instructional problem: *What is it that you need to teach? The instructional designer may conduct a needs assessment, goal analysis, or performance assessment to determine the instructional goal (Morrison, Ross, & Kemp, 2007).*

2. Examine intended audience: *Describe the demographic characteristics of the learner and their background knowledge (Morrison, Ross, & Kemp, 2007).*

3. Analyze subject content: *Consider the real world applications of the content from the learner's perspective. Determine the learning context and performance context. What knowledge and skills, procedures, and communication is necessary (Morrison, Ross, & Kemp, 2007)?*

4. Write instructional objectives: *Define the cognitive and behavioral skills the learner will perform as a result of the instruction. Include criteria and conditions specific to the instruction (Morrison, Ross, & Kemp, 2007).*

5. Order instructional content: *Determine a logical sequence for the instruction while considering variables such as prerequisites and level of difficulty (Morrison, Ross, & Kemp, 2007).*

6. Decide how to present material: *Develop instructional strategies for recall, integration, organizational, and elaboration. Examples include memorization, generating questions, categorizing, and creating diagrams (Morrison, Ross, & Kemp, 2007).*

7. Develop the instruction: *Prior to instruction, conduct a pre-test, state the objectives to the learners, and present and overview to the learner. Decide how to introduce your "message" to the audience (Morrison, Ross, & Kemp, 2007).*

8. Develop evaluation instruments: *Conduct formative and summative evaluations based on standards of achievement. Include opportunities for self-evaluation, as well as testing for skills, behaviors, and attitudes (Morrison, Ross, & Kemp, 2007).*

8. Select relevant resources: _Identify supplementary resources such as media and examples, equipment, and even personnel to support your instruction (Morrison, Ross, & Kemp, 2007)._

It is also important to note that the nine elements are not the only phases of this design method. Morrison, Ross and Kemp surrounded these nine elements with outer ovals indicating that they are ongoing processes throughout development and implementation of the instruction. The first oval indicates the importance of revision and formative evaluation at each stage of the design process. The outer oval depicts one of the most unique features of this model. While evaluation and implementation are commonly included in other models, there are 3 elements which typically lack in other models implementation. Specifically, the planning, project management, and support services phases. Using Kemp's model, throughout the design process, a designer must select appropriate resources, plan on a continual basis, and manage the project appropriately given the constraints. (Henley, 2007). The outer oval are factors which contribute to making this model a truly comprehensive process.

There are both strengths and weaknesses of the Kemp Model. The previously discussed ADDIE method is linear and easy to remember given the acronoym (A is for Analysis, D is for Design, and so on). The Kemp method has many more steps, making it more difficult to remember the process. A designer new to this model would likely have to reference the diagram throughout the process. The details could also be considered a strength because the Kemp model provides more information to a designer as far as what to do. Instead of just saying "Analyze", the Kemp model instructs a designer to analyze the learners, the problem, and the task.

A novice designer may not opt to use this model due to the lack of direction. As mentioned previously, there is no beginning or ending point which could be confusing. That characteristic could also be considered a strength. This highly adaptable model allows an experienced designer to be creative and start or stop the process wherever it is deemed appropriate.

KEMP Model Example

The following lesson was designed using the Kemp model. The instructional objective is for students to sequence the 8 phases of the moon within the lunar cycle. The designer elected to utilize all 9 steps, in the following order.

Instructional Problem:	The instruction problem addressed is student misconceptions about the moon, and misunderstanding of the phases of the moon within the sequence of the lunar cycle.
Learner Characteristics:	*Grade*: Third Grade *Age Range*: 7 – 8 years *Learner Skills:* Visualizing, Ordering, and Predicting *Prior Knowledge:* Students have knowledge of the: (1) Position of the moon in relation to the Earth and the Sun; (2) words rotation and revolution.
Subject Content and Task Components:	Student will learn the words waxing and waning. Student will understand the role of the sun on the lunar cycle. Student will observe phases of the moon. Student will review phases and cycle. Student will label phases of the moon within a lunar cycle
Instructional Objectives	Given pictures of the phases of the moon the student will: (1) Identify the name and label each of the phases of the moon; (2) Place the phases in their appropriate position on the lunar cycle.
Sequencing Content	Student will watch 5-minute video clip from Newton's Apple over Phases of the moon. Student will discuss/ sketch various types of moons that they have observed in their lifetime/ Student will observe lunar phase simulator to identify the phase of their previous sketch and its position within the lunar cycle. Student will participate (whole class) in SMART Exchange Activity: Moon Phases to review phases of the moon and the lunar cycle or QUIA interactive games. Student will identify and match phase of the moon Student will place moon phase in the correct order within the lunar cycle. Student will individually create a flipbook of the phases.
Instructional Strategies	Review/Check for prior knowledge Observe Link new information to prior knowledge Large group instruction Simulations Technology Tools Use of graphic organizer Re-teach

Instructional Message and Delivery:	The message will be delivered using a variety of visual aides, multimedia and interactive activities to engage the learner such as: Elementary CORE Academy Handbook: Moon Flipbook http://www.uen.org/Lessonplan/downloadFile.cgi?file=10988-2-14754-flip_book.pdf&filename=flip_book.pdf Quia Java Games: Moon Matching http://www.quia.com/mc/431146.html Quia Ordered List: Put Moon Phases http://www.quia.com/rd/11412.html Lunar Phase Simulator: Flash http://astro.unl.edu/naap/lps/animations/lps,swf SMART Exchange: Moon Phases Collection http://exchange.smarttech.com/search.html?m=01&q=Phases+of+the+Moon Newton's Apple Video: Phases of the moon http://www.newtonsapple.tv/video.php?id=1671
Evaluation Instruments	Learners will participate in whole class simulated assessment using interactive technologies. Learner will individually create a flipbook modeling the phases of the moon and lunar cycle.
Resources	Document Camera Data Projector Smart Board Computer Internet Access Scissors Stapler
Ongoing Processes	Planning Revising Evaluation Management

ADDIE & Kemp Comparison

      There are several similarities between the ADDIE and Kemp models. As shown in the figure below, the phase in the Kemp model referring to the "instructional problem", "examine the intended audience", and "analyze the subject content" are similar to the analysis phase of the ADDIE model. Another similarity is that the "write instructional content", "order instructional content", "decide how to present material", and "select relevant resources" of the Kemp Model are also similar to the design phase of the ADDIE model. The third similarity is that the "develop the instruction" phase of the Kemp model is also similar to the development phase of the ADDIE model. Finally the "develop evaluation instruments", "formative evaluation" and "summative evaluation" of the Kemp model is very similar to the evaluation phase of the ADDIE model.

      There are also several differences. The biggest difference is that the ADDIE model is a linear model and the Kemp model is nonlinear. This makes the ADDIE model more structured and the Kemp more adaptable. Another difference is that the ADDIE model has a phase of implementation of the materials whereas in the Kemp model, the implementation surrounds all of its steps. The Kemp Model includes three elements not present in the ADDIE method: planning, support services, and project managent. The Kemp model is also broken into nine phases of instruction whereas the ADDIE model is only broken into five.
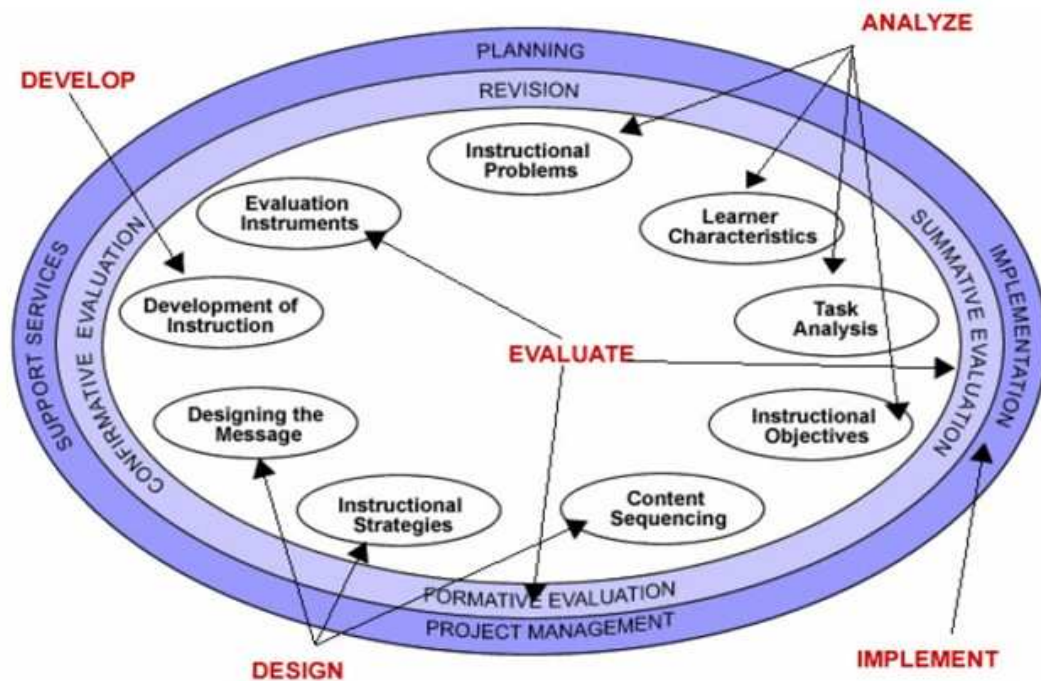

Figure 3. The ADDIE steps applied to the M-R-K Model (after Morrison, Ross & Kemp 2004, p.29)

Conclusion

    Both the ADDIE and Kemp instructional design models will provide a designer with a process for developing instruction. If the designer prefers a more structured approach to instructional design then the ADDIE model is a great model to choose. The Kemp model may be more appropriate for a well experienced instructional designer since it allows a designer creative freedom to start the design process at any point. Regardless of the model chosen, the outcome is a well thought plan, a blueprint for instruction.

Resources

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