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A qualitative analysis and comparison of the two contemporary models of instructional design

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Abstract
This study aims to qualitatively investigate the degree of correspondence between the generic instructional design model that is shortly called ADDIE and two other contemporary models of instructional design, FutureU and Işman Instructional Design Models. ADDIE is considered to be the ancestor of contemporary models of instructional design and it is thus believed to be reflected to certain degrees in the following models of instructional design. In short, this study aims to examine similarities and differences between the generic model and its two follower models by examining similarities and differences. These qualitative comparisons were centered upon the two main themes that were derived in respect to the basic principles of instructional design. The two main qualitative themes and thus the examination criteria for the study included a) what ADDIE components were included and how they were reflected and b) what structural characteristics these two models exhibit. The results showed that the two models represent a considerable number of similarities to the generic ADDIE model and the differences were only on the varied applications or adaptations of the firmly established dimensions already offered by the ADDIE model itself.

Keywords: Addie model; instructional design; curriculum development; futureu instructional design model; işman instructional design model.

Introduction

Smith and Ragan (2005, p. 4) define Instructional Design (ID) as "the systematic and reflective process of translating principles of learning and instruction into plans for instructional materials, activities, information resources and evaluation". It may shortly refer to "a conceptual model for developing instruction" (Magliaro & Shambaugh, 2006, p. 83) and it is typically based on the generic ADDIE Model which is composed of five stages: **a**nalysis, **d**esign, **d**evelopment, **i**mplementation and **e**valuation (see Appendix A). As Molenda (2003) puts forth ADDIE appears not to have a sole author, but it has evolved and disseminated through word-of-mouth tradition. It is a generic model, that is, an umbrella term from which the following models have drawn their underlying structures and their main components (Morrison, Ross & Kemp, 2004). Thus, the current models were based on this model and varied or expanded some of its parts (Piskurich, 2006). Such contemporary and popular models include the Dick & Carey ID Model (Dick & Carey, 1990), Kemp ID Model (Kemp, 1977) and Gagné's Nine Events of Instruction ID Model (Gagne, 1985) from the international literature**.** Likewise, some national ID attempts utilizing the components suggested by the generic model have been also performed by several Turkish researchers (Fer, 2009; Kabadayı, 2001; Köksal, 2009). Based on our assumption that the generic ADDIE Model should be reflected on the future ID models, we attempted to investigate the two recent models (FutureU and Isman ID Models) by making comparisons to the generic ADDIE Model. For the purpose of this paper, we sought to analyze the two instructional design (ID) models for a) what ADDIE components were included and how they were reflected and b) model structural characteristics.

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Method

This study aims to qualitatively compare the two instructional design (ID) models by reflecting upon their suitability or correspondence to the generic ADDIE Model. Hence, the researcher first derived two criteria or themes based upon the literature review on the basic principles and characteristics of instructional design to investigate and compare the models. These two themes were a) what ADDIE components were included and how they were reflected and b) what structural characteristics these models possess. The qualitative data on the two models were collected with regard to these two themes derived and the following comparative analyses were performed. The following presents these qualitative results first in respect to the models and then to two examination criteria.

Results on the FutureU ID Model

a) What ADDIE Components Were Included and How Were They Reflected?

In the FutureU ID Model for Online Learning developed by Whitmyer (1999), it seems that she has taken the key design cycle stages described by ADDIE. Her ID model is characterized by four phases which are *discovery*, *design*, *development* and *delivery* rather than the five-phased structure of ADDIE. The analysis stage of ADDIE is the same as the Discovery Phase of FutureU. Whitmyer (1999) has reported five steps for this phase. In comparing what is actually worded out in the steps of the Discovery phase, the steps seem very similar to the ones expressed by the ADDIE with its Analysis stage. Whitmyer (1999) summarizes the basic questions posed by ADDIE Model in the brief literature review part of her article. In comparing the two main stages, they share a lot in common. It appears that Whitmyer (1999) has just taken, paraphrased and added new questions to what ADDIE has suggested. Table 1 shows the similarities of the two as Whitmyer (1999, pp. 1, 2 & 6) presented in her article. However, in looking at the second and third stages Whitmyer's ID Model, it is apparent that she has added the intended learning outcomes (ILO), which is a contemporary term used for objectives. As she designed a course (an online one), with the ILO terminology, it seems that she has also employed some terminology from the ID course model developed by Posner and Rudnitsky (1997).

Table 1
The Comparison of the Analysis (ADDIE) and Discovery (FutureU) Stages

ADDIE ID Model	FutureU ID Model
Who is your audience? (Who are your learners?)	Step 4: Who will your students be?
What is the purpose of the instruction?	Step 1: What is required by your curriculum?
What knowledge, skills, or attitudes must be taught?	Step 2: What learning outcomes are you looking for? Step 3: What learning objectives will result in those outcomes?
How much can you cover within the constraints for the learning unit in question (e.g., tutorial, workshop, course, program, degree, etc.)?	Step 5: What are the available resources?

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Whitmyer (1999) starts considering the ILO from the very beginning, while the ADDIE Model leaves it to the later step of Design. ADDIE ID Model exhibited the content (What knowledge, skills, or attitudes must be taught?) as a seperate stage while Whitmyer (1999) included it under the title of available resources. In further looking at the design stages of the two models, both models center on the instructional objectives. That is, composing the instructional objectives is a main principle of the design stage of the ADDIE generic model and it is also applied to the FutureU. FutureU applies the objectives component as it should be with the ADDIE, but it further develops it in the form of a hierarchical relationship. FutureU ID Model does not suggest a complete visual mental model. Whitmyer (1999) attempts to create models or figures for only two of the four phases of the ID model. These phases are the design phase and the delivery phase (see Appendix B for the mental model of the two phases). The components of the model for the design phase is linked by arrows showing the linear nature of the relationship, which is again one of the main principles represented in the ADDIE generic ID model. Whitmyer (199) further develops this phase by adding eight special considerations (e.g. technology, time management, phasing of the technological developments and facilitation) drawn according to the learning environment and situation of the course she sought to develop. As she does not present them within a visual model and provided no further explanation for the operation of these considerations in the text, it is difficult to comment on the nature of horizontal and vertical relationships of the considerations within the ID model. However, from the textual information provided, it is clear that it also follows a step-by-step design. The development phase of the FutureU has been drawn a lot from the generic model of ADDIE in that both focus on the process of specifying how it is to be learned in the development phase and also of the development of materials and media. The delivery phase of the FutureU and the implementation stage of the ADDIE centers on the process of creation of the learning environment for the learners. As ADDIE is a generic model with no developed further rationale and steps, Whitmyer (1999) has herself further developed five stages suited to the nature of online courses (see Appendix C for a visual model of the delivery phase).

The FutureU ID model has four phases in comparison to the five phases suggested by the ADDIE. Thus, it is not difficult to understand why the assessment component has not been mentioned in the FutureU. Though FutureU ID Model is recommended for the online courses, by convention there should be an evaluation section; however, there is no similar stage. The FutureU Model says nothing for the determination of the adequacy of the (online) instruction. Therefore, one can say that the evaluation dimension of the generic ADDIE model has not been reflected in the FutureU ID model.

b) What Are the Structural Characteristics of the Two Models?

The structural characteristics refer to the analyses of the relationships between the components included in the ID models. Though several other categories of visual representations to represent the ID models (metaphoric and conceptual-dynamic as suggested by Magliaro and Shambaugh, 2006), the two models discussed above in detail were both included in the *conceptual-sequential* category. As is also pointed out above, both models depict a liner, step-by-step process. To show such a relationship between the components of the models, usually arrows and/or lines in an ordered fashion are employed in both ID models (the model is not well developed (not full) for the FutureU ID model). In both models, "the rectilinear row of boxes" (Gustafson & Branch, 1997, as cited in Magliaro & Shambaugh, 2006, p. 93) are apparent. Another striking characteristic is the "inherent hierarchy of activity" (Magliaro & Shambaugh, 2006, p. 93) with the FutureU model. In other words, as there is no full visual model for the FutureU ID model but only two of the phases are depicted with some kind of a visual representation, it seems that these two phases are more important than the other phases so they deserved more attention and visualization. For the other model, all of the stages (components) appear to be given equal importance. For both models, it seems that each earlier step affects the next one somehow, but these steps are also wholes within themselves.

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Results on the Işman ID Model

a) What ADDIE Components Were Included and How Were They Reflected?

The major rationale behind the Isman ID Model originates from the significance of the instructional planning and the implementation process within a learning situation. İşman (2005) appears as one of the instructional designers who take planning, developing, implementation and evaluation as the most important components of the instructional design model. Given the theories concerning the instructional design model, it appears that there are some components or insights taken from behaviorism, cognitivism and constructivism. The idea of behaviorism is reflected into the process as considering the stimulus-response, reinforcement concepts as well as the environmental conditions. Cognitivism is taken into consideration when motivation, intellectual learning process, experiences and contents are concerned and the signs of constructivism become apparent in the roles of both teachers and learners in the process.

When the influence or reflection of ADDIE components in the model is questioned, there appear many similarities in terms of the approach on which both models are based and the stages of the instructional process but there are also some important differences. It is an undeniable fact that models are similar in that they are both based on a systematic approach, enabling the designers to follow an organized procedure. As for the phases of each model, it seems that most of the ideas overlap in both designs; however, there are some components of ADDIE design which are not reflected on the model by İşman.

İşman (2005) designs his model according to five main steps – *input*, *process*, *output*, *feedback and learning* (see Appendix D for the Isman Model) whereas in the ADDIE Model the steps are named as *analysis*, *design*, *development*, *implementation* and *evaluation*. The similarities and the differences between two models are shown in Table 2.

Table 2
The Comparison of Isman and ADDIE ID Model

ADDIE Model	IŞMAN MODEL
Analysis	**Input**
needs assessment (1)	identify needs (1)
problem identification*	identify contents (2)
task analysis (2)	identify goals and objectives (3)
Design	identify evaluation materials (4)
write objectives (3)	identify teaching methods (5)
develop test items (4)	identify instructional media (6)
plan instruction (5)	
identify resources (6)	
Development	
work with procedures*	
develop workbook, flowchart, program*	
Implementation	**Process**
teacher training*	test prototypes*
tryout (7)	redesigning of instruction*
	teaching activities (7)
Evaluation	**Output**
recorded time data (8)	testing (8)
interpret test results (9)	analyze results (9)
survey graduates*	**Feedback**
revise activities (10)	revise instruction (10)
	Learning

Note. Numbers represent similarities and the symbol "*" the differences; The ADDIE part was taken from http://www.cs.ucy.ac.cy/~nicolast/courses/cs654/lectures/IDmodels.pdf

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As is seen from the figure, the analysis and design steps of the ADDIE Model are combined under one title in ISMAN Model and the sub-dimensions are similar except the "problem identification" phase in the ADDIE Model. However, the development part of the ADDIE Model is not reflected in ISMAN Model. The implementation phase of the ADDIE model and the process step of the ISMAN Model have only one common point, that is, the implementation of the activities. As for the assessment aspect, the evaluation step in ADDIE Model seems divided into two categories in ISMAN Model – output and feedback. All the sub-dimensions are similar except "the survey graduates" phase in the ADDIE Model. The last stage of the ISMAN Model (learning) doesn't have a specific place in the ADDIE Model; nevertheless, both models check whether the learning has occurred or not throughout the whole process.

b) What Are the Structural Characteristics of the Two Models?

The designer describes his model as a five-step systematic planning process. The first step is named as "input" where needs, contents, goals and objectives, teaching methods, materials and instructional resources are clarified. In the second step, that is, the "process" stage, the main focus is on pretests, organization and revision of activities. The importance of this step is emphasized by the designer in that the success of the process directly affects the attainment of goals. The third step named as "output" involves the assessment and the analysis of the results where the designer aims to investigate whether the target skills are demonstrated, goals and objectives are attained. The next step is based on the information gathered through "feedback" enabling the revision of the instructional process. After making modifications according to the feedback results, the last step, "learning" occurs and this stage is where it is made certain that the students have acquired the knowledge, skills and ideas aimed by the instructional plan.

Given the structure presented and the explanations of the designer, it can be claimed that there is a dynamic relationship between all steps, thus meaning that the design is open to revision and modifications all the time and the designer is able to change the direction of his plan according to the needs of the learning environment.

Discussion

Given the above discussion, the first implication would be that both of the contemporary models have drawn a lot from the generic ADDIE ID Model. That is, most stages or components of the ADDIE has been taken and often developed further in both ID models. However, there appear some components that have been eliminated. For instance, FutureU lacks any evaluation component throughout the design process. Likewise, İşman Model also lacks the development stage in the ADDIE Model. Furthermore, though some components of the ADDIE Model have been drawn by the two contemporary models, these components were either developed further by adding more details to the generic ones or located differently within the instructional development cycle. For example, analysis and design components of the generic ADDIE ID model were merged in the İşman ID Model in the new title of input. In such attempts, the generic characteristics of the ADDIE Model were kept and thus the changes made were often substantial in that only the titles or more details were added over the generic ideas. Therefore, we still observe that the characteristics put forth by the ADDIE Model that are analysis, strategy development, implementation and evaluation continue to be the essence of the most contemporary ID models. In other words, it would be wise to suggest that ADDIE Model could be accurately termed "A Common Model of Instructional Design". However, the instructional design literature has briefly shown us that this ID model is a universal and generic one (Magliaro & Shambaugh, 2006). However, there would be some new attributions of its follower contemporary models such as the inclusion of some new components or terms and such attempts were clearly observed in the two that were evaluated for the purposes of this study. As Smith and Ragan (2005) put forth, an instructional designer is similar to an engineer. Both plan and design their work for the end-users. In this process, though, they are humans and thus creative and different from one another, which

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can expectedly make their products different than one another. In short, the developmental attempts of instructional designers will result in different variations of these models. However, since the instructional designers will plan their models based on the general principles of instruction and teaching (Smith & Ragan, 2005, p. 4) and also of the existing theoretical background in curriculum development during the planning stage, there would inevitably be some expected similarities. Andrews and Goodson (1980) and Gustafson and Branch (1997) offer a more detailed and extensive analysis on some other instructional design models (i.e. more traditional ID models) and not only curriculum developers or ID professionals but also teachers themselves not being only passive "transmitters of curricula" anymore (Kabadayı, 2016, p. 10) are advised to utilize such resources for a better design and application of their design processes.

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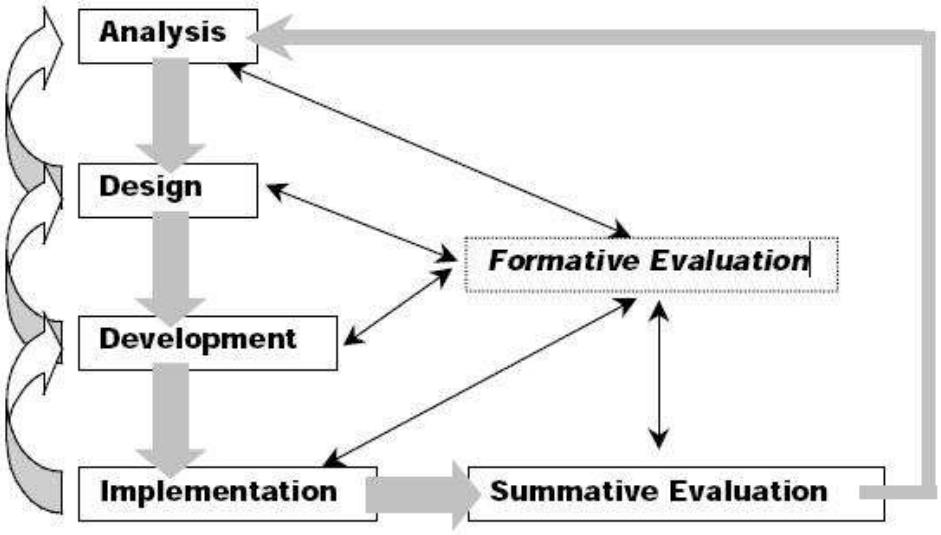
Appendix A

The ADDIE Model (from the Instructional Design Models, n.d.)



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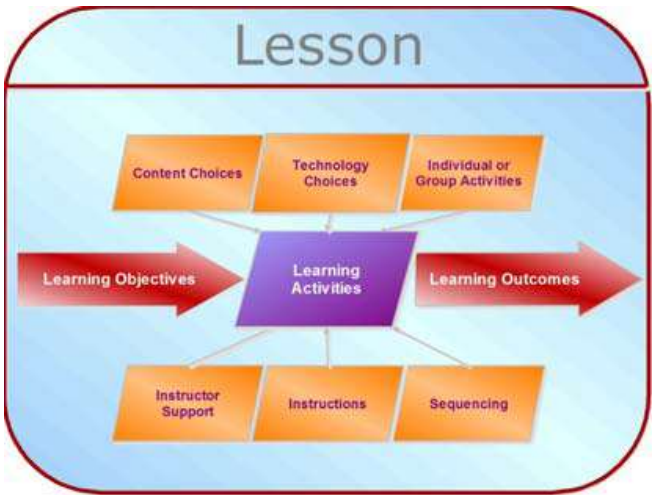
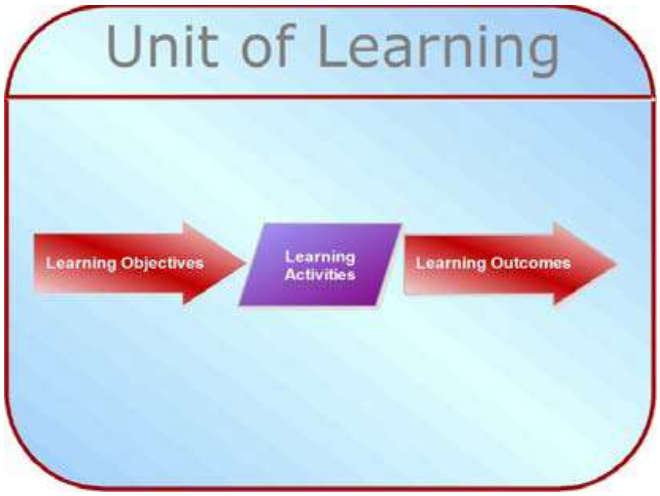
Appendix B

Units of learning and Lesson Components of the Design Phase of the FutureU Model (from Whitmyer, 1999, p.8)





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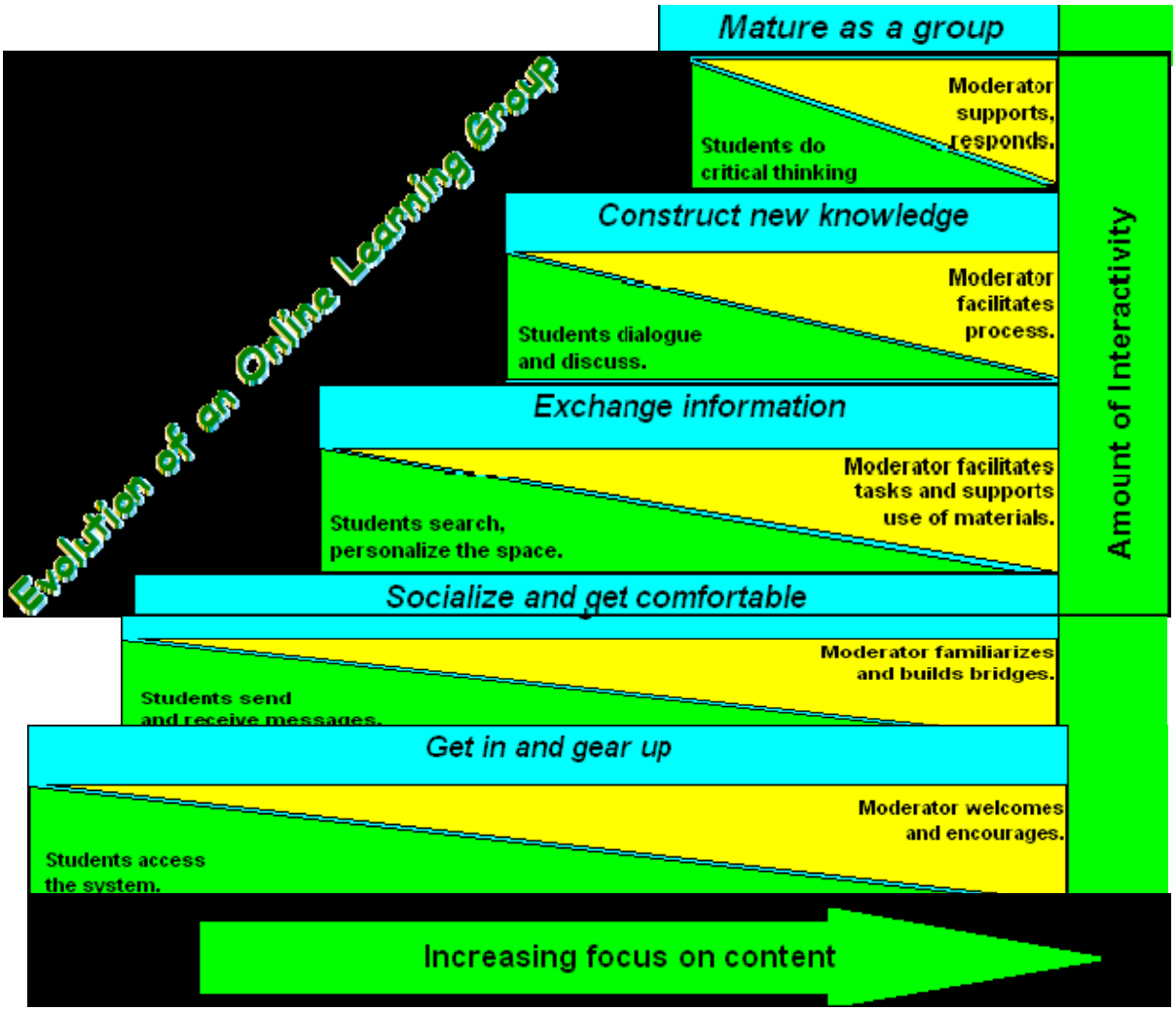
Appendix C

Visual Model of the Delivery Phase of the Futureu ID Model (from Whitmyer, 1999, p.11)



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Appendix D

The Işman Model (from İşman, 2005, p. 49)

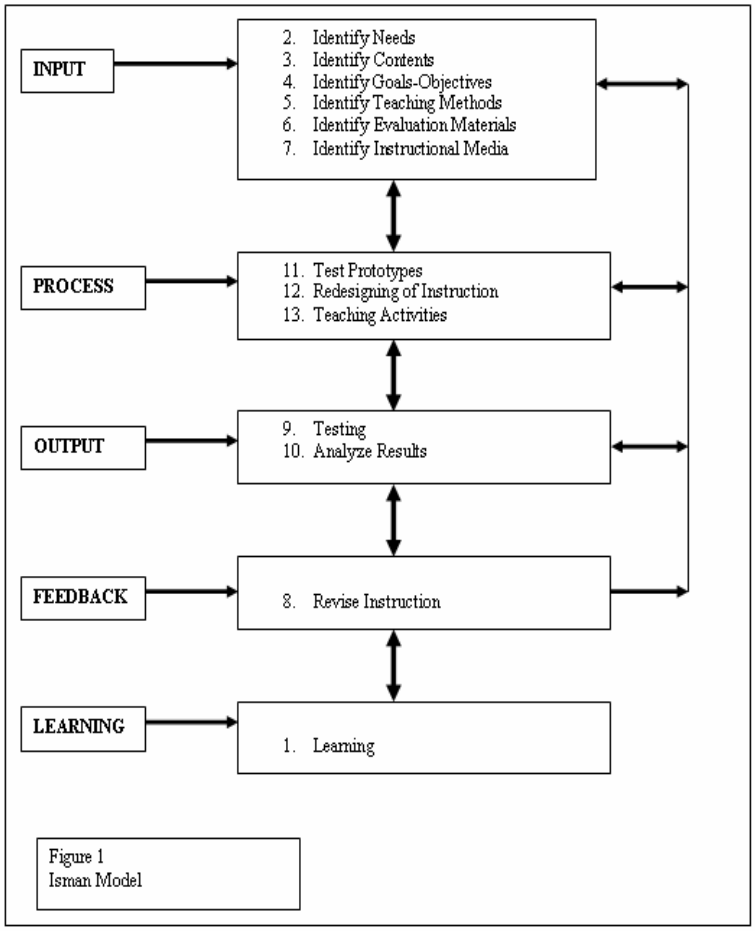

Figure 1
Isman Model