

## Instructional Design models

By Sharon Maguire, April 2008

*This paper will analyse and reflect on ways of conceiving Instructional Design by discussing the key features and implications for practice of an Instructional Design (ID) model that I prefer, along with a discussion of its application in practice to take account of context and content. I will also offer a comparison and contrast of this model against two (2) other ID models*

Several models of Instructional Design have been put forward throughout module two (2) of ESV221 Flexible and E-learning Design in AVE; Smith and Ragan's (2004) simple model of design, Merrill's (2002a) First Principles of Instruction and his Pebble-in-the-Pond model (2002b) based on those principles, Gagné's (1985) conditions of learning and principles of Instructional Design, the well known Instructional Systems Design (ISD) model ADDIE, another well known model the "Dick and Carey" model, along with Oliver and Herrington's (2003) three stage proposal. These models provide varying ways for us as designers to visualise, comprehend and negotiate our design tasks, the context of which determines a specific models value (Ryder, 2008). "ID is a dynamic process with constant movement back and forth between the steps... If evaluation alters the objectives, it also alters the content, and both need to be re-addressed" (Thompson, 2001).

Instructional Design Models are based on the theory and practice of adult learning. In 1955 Benjamin Bloom published a taxonomy of educational objectives, what he termed the three domains of learning: Cognitive, Psychomotor and Affective. These domains deal with what we know or think, what we do physically, what we feel and what attitudes we have. These taxonomies are still considered to influence the design of instruction (Instructional Design, 2008). One needs to understand contemporary theories and practices related to learning in order to create instruction that facilitates effective learning.

My justification for choosing a preferred model of Instructional Design is partly based on my current understanding of learning, applicable theories and how they inform design; I see learning as being the connections and meanings [cognitive process] we make from the observations and interactions we have with our environment every day, it is a socially and culturally influenced process that is happening all the time, it is the process of constructing our perception of the world and forming the explanatory models from which we make meaning and build understanding (Engeström, 1994). Interactive, dialogic approaches that

reflect broad community values and provide learners with opportunities to communicate, share their learning and creations, and participate in social interaction encourages deeper levels of learning and provides potentiality to reach zones of proximal development (Vygotsky, 1978, cited in Engeström, 1994). The learning environment should be agentive to channelled critical reflection and scaffolding as a means of providing support and guiding development towards potential. Provision should be made for collaborative learning, and ample task choices and activities supplied to encourage ownership and self-direction, with flexibility of choice in goals, outcomes and assessments, enabling students to make selections best suited to their individual learning styles. There must also be responsive direction and mentoring from tutors with scope for modification should student feedback require it (Mcloughlin & Oliver, 1999).

“By applying constructivist theory such as situated cognition or cognitive apprenticeship (Brown, 1997; Collins, Brown & Newman, 1989) Instructional Designers can plan activities where learning is a process of participation, communication and co-construction of knowledge” (Mcloughlin & Oliver, 1999, p.10).

Smith and Ragan (2004) propose a simple method of Instructional Design consisting of three main components; analysis, strategy assessment and evaluation. They suggest these components are the essence of most Instructional Design models, the aim being to facilitate learning in an efficient, engaging and effective way. The general principals of design are seen as a systematic process largely oriented towards problem solving. It is both learning and learner centred with congruence between objectives, instruction, learning activities and evaluation. Smith and Ragan (2004, p. 356) state “The design of instruction must be directed by needs and shaped to fit the learning environment”. This is the model I prefer, as I see it as a foundation model or framework upon which I can create my own model of design to suit the context and content of the area I work in. It also appears to reflect how teachers naturally work when planning lessons, course work and assessment tasks, it is descriptive of the subconscious natural way we plan and organise.

I teach and assess units of competency from the ICA05 Information Technology Training Package and feel that the simple method of design (Smith & Ragan, 2005) is best suited to improving my current delivery and assessment methods and is also accommodative of the tools and resources already created.

In the analysis stage of Smith and Ragan's model (2005) the first critical step is analysing the learning context; the first component of this step is conducting a 'needs assessment', identifying what instruction already exists, indentifying problems with existing instruction and clarifying learning aims and objectives. The next component of this step is describing the learning environment which encompasses characteristics of the trainer, existing curricula, hardware, characteristics of classes and facilities, characteristics of the organisational system and educational institution and identifying philosophies and taboos of the community in which the institution exists. The second step in the analysis stage is analysing learner characteristics; cognitive, physiological affective, socio-cultural, determining similarities, determining differences and most importantly, determining prior knowledge and experience. The identification of learner characteristics has direct implications for instructional strategies. The third step is analysing the learning task; writing learning goals, determining the type of learning outcomes the goals represent [at this step a variation on Gagné's learning categorisation system is used to categorise the outcomes], and conducting an information-processing analysis whereby the mental and physical steps required to complete a learning task are determined and performance objectives are written. Assessments are written in the fourth [last] step of analysis. Of particular interest to me here is the nature and timing of assessments so they are viewed by learners as part of the learning task. Many of my existing assessment instruments are formulate in nature and sit well with Smith and Ragan's (2005) views. Other aspects of this step include entry skills assessments to determine if learners are ready for assessment, pre-assessments to determine what learners already know and post-assessments to see what learners have learned.

Most of my teaching is conducted in a face to face environment that is flexible and self paced in nature, my role as teacher is more akin to that of facilitator. My goal is to utilise as many of my current resources as possible, in the creation of an online environment specifically suited to the local community, offering a blended delivery mode to cater for the increasing amount of students studying from home. It is for this reason that the analysis stage of Smith and Ragan's model (2005) is of particular value to me, it underpins the selection of appropriate instructional strategies, evaluation instruments and procedures. This appears congruent with Oliver and Blanksby (2003) and Oliver and Herrington's (2003) positions, who strongly advocate the importance of selecting appropriate learning activities as the organising element of Instructional Design, through the first step of their three stage design framework [designing learning tasks to engage and direct the learner]. Biggs (1999, cited in Oliver, 2004) argues the starting point for effective course design should be learning aims

and objectives that indicate what students will learn, to what extent, and how competence can be demonstrated and assessed, which ultimately helps define the learning context.

The second stage of Smith and Ragan's Instructional Design model (2005) deals with strategy assessment. The first step in this stage deals with developing instructional strategy; at the lesson level organisational strategies are determined as they relate to the learning environments, that is, what content should be presented, how it should be presented and the sequence it should follow. Decisions here are based on information gathered in the analysis stage. A list of fifteen (15) instructional events based on cognitive processes of the learner, is presented to help determine appropriate strategies, and in particular whether they should be generative or supplantive in nature. These instructional events draw heavily on the work of Gagné. It is from here that relevant instruction is written and produced according to the strategies identified; declarative knowledge, concept learning, learning procedures, principle learning, problem solving, cognitive strategy, attitude learning, psychomotor skill learning, holistic integrated learning. Other steps at this stage deal with delivery; media and grouping, and management; scheduling and resources. Revisions to instruction are also made at this stage.

The third, and last, stage of Smith and Ragan's model (2005) deals with implementation, management and evaluation. The first step of this stage deals with implementation; timing, stages of the adoption process, principles for encouraging implementation, approaches to facilitating implementation, fidelity of implementation, adoption, adaptation and integration and embodiment as part of implementation. The next step of this stage deals with management of instruction; defining project management, project management in ID, standards, integration, scope, cost, human resources, risk, change and crisis management. The third, and last, stage deals with evaluation; Formative evaluation and Summative evaluation. Evaluation measures performance in regard to student learning and success of the instruction itself. Test items are written at this stage and evaluation is ongoing, instruction is rewritten, a cycle of improvement and continual revision begins, perpetual cycling back though all stages of the design model as improvements are made and instruction is refined.

Merrill (2002a) premises the existence of five first principles of instruction; problem, activation, demonstration, application and integration. He suggests one or more of these principles can be found in most design models, his problem based Pebble-in-the-Pond model for instructional development utilises all five principles (2002b). At the problem phase it is

suggested that real-world problems facilitate learning, at the activation phase past experience and new experiences lay the foundation for what is to be learned, at the demonstration phase learners are provided with examples and guidance, at the application phase learners apply knowledge in solving sequenced problems and performing sequenced tasks guided by feedback and coaching, at the integration stage learners demonstrate their new skill, reflect, discuss, explore and create new ways to use their new knowledge. I see Merrill's model as particularly good for skill and task mastery and feel it could be of value in designing instruction for units from the Information Technology training package. I would be likely to use this model to assist me in the creation of specific learning tasks and activities of a problem based nature, which could then be incorporated into the instructional strategy phase of Smith and Ragan's (2005) model.

Merrill's model (2002b) promotes the use of scaffolding in the early stages of problem solving towards increased self direction at latter stages. Self direction, when interpreted as an atomistical isolated process of self contained focus on personal learning projects, may serve to be repressive and perpetuate culturally framed ways of knowing and understanding. Design activity should seek to encourage a form of self direction, conducive to deep learning, with its interpretive roots in social constructivism. From this perspective, the design of instruction values interdependence, common good, common interests and collective action through communicative discourse, critical reflection and collaborative activity, essentially preparing the learner to problem solve in indistinct situations (Brookfield, 1993).

Gagné's ideas (1985, cited in Bostock 1996) illustrate the importance of learning theories to Instructional Design practice; he identifies five categories of learning; intellectual skills, cognitive strategies, verbal information, motor skills and attitudes. He suggests nine instructional strategy 'events' to facilitate learning within these categories; gain attention, inform learners of objectives, stimulate recall of prior learning, present the content, provide "learning guidance", elicit performance (practice), provide feedback about correctness, assess performance. Gagné is considered the father of Instructional Design by many, including Merrill (2000), and his system is utilised in Smith and Ragan's book 'Instructional Design, Third Edition' (2005) as the foundation for learning task analysis. Gagne's theory has been attributed to providing the basis of what is termed 'conditions-based' models of Instructional Design, which propose that "(a) learning can be classified into categories of similar cognitive processes for learning... and (b) within these categories of learning similar instructional supports are needed to facilitate learning" (Smith and Ragan, 2000, p. 170)

In conclusion, it is not my position that I would follow any model of design prescriptively, but rather use it as a flexible framework to keep me focussed on the design tasks and to help me identify those aspects that are of critical importance in relation to the context and content that serve to inform the finished product. I have given an in depth overview of Smith and Ragan's model (2005), particularly the analysis stage, and how I see its application in practice taking account of context and content. In relation to comparisons between Smith and Ragan (2005) and Merrill (2000b) models, I feel they could be interpreted and broken down in similar ways, Merrill's model appears to be behaviourist/cognitivist in nature and Smith and Ragan's model appears to be constructivist/cognitivist in nature. Both are conditions based models (Smith & Ragan, 2000). I see value in using the two together. Both draw heavily, and are influenced by, the work of Gagné, particularly in relation to how learning is understood and the use of scaffolding, feedback and reinforcement. I see Instructional Design models and related theories as the underpinning knowledge that serves our own reflection and meaning making, the experience from which we construct our own knowledge of our learners, interpret their needs and expectations, and continually revisit when formulating instruction.

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