3

Chapter 3 – The Arcs Model of Motivational Design

Forethoughts

Here is an exercise that I frequently do when I am teaching motivational design. It helps to reveal some key issues related to motivational experiences versus motivational design (Figure 3.1).

Imagine that you just finished taking the most interesting, motivating class you ever attended and then list some of the things that made it that way.

I like it when ... [These are some things that get or hold my interest in a class.]

1.
2.
3.
4.
5.

Now imagine that you just finished taking the most boring, uninteresting, demotivating class you ever attended, and then list some of the things that made it that way.

I don't like it when ... [These are some things that bore or irritate me in a class.]

1.
2.
3.
4.
5.

Figure 3.1. Motivational Likes and Dislikes.

If you did this exercise, you have shown that you know a great deal about what makes a class motivating. The question is, when you design a lesson or a course or when you prepare to teach is this knowledge that is derived from reflection on your own experiences sufficient to guide you? Or, do you find that there are gaps in your knowledge of how to create a motivating learning environment?

J.M. Keller, *Motivational Design for Learning and Performance*,
DOI 10.1007/978-1-4419-1250-3_3, © Springer Science+Business Media, LLC 2010

Introduction

Typically, even though they have years of experience as students and can potentially list motivating versus demotivating events, people feel that they do not have a reasoned, systematic approach to dealing with the motivational aspects of instructional design and teaching. Some people have a great deal of talent and are highly successful based on their experience and, perhaps, charisma, but they might be more limited in their repertoire than they wish they were. The answers they give to the question about gaps in their knowledge are usually of two types:

> "I don't have a good understanding of all the factors that influence student motivation; I lack a clear grasp of the specific factors involved. There are too many things to think about, and it's too fuzzy."

> "I don't know how to determine what kinds of motivational strategies to use, how many to use, or how to design them into the lesson."

The specific aim of the ARCS motivation model (Keller, 1987b, 1987c, 2008a) is to provide guidance for creating answers to these questions. This chapter provides an introduction to the ARCS model and serves as a foundation for the remaining chapters which are, for the most part, elaborations of the points made in this chapter. The first part of this chapter contains a description of the motivational variables and sample strategies that comprise the four categories of the ARCS model, the second part covers the systematic design process, and the final part discusses the relationship between motivational design and instructional design. The ARCS model, per se, was first introduced in 1984 (Keller, 1984) and I have published numerous articles, book chapters, and workshop materials that describe the model (for example, Keller, 1987a, 1987b, 1987c, 1999, 2008a; Keller & Suzuki, 1988). Therefore, the material in this chapter is derived in part from this background.

Categories of the ARCS Model

Based on an extensive review of the motivational literature which led to a clustering of motivational concepts based on their shared attributes, Keller (1979, 1983b) found they could be sorted into four categories. After making some modifications to the original cluster titles, the ARCS model (Table 3.1) was introduced (Keller, 1984). These categories enable you to quickly gain an overview of the major dimensions of human motivation, especially in the context of learning motivation, and how to create strategies to stimulate and sustain motivation in each of the four areas.

The first category, Attention, contains motivational variables related to stimulating and sustaining learners' curiosities and interests. In

Table 3.1. ARCS Model Categories, Definitions, and Process Questions.

Major Categories and Definitions		Process Questions
Attention	Capturing the interest of learners; stimulating the curiosity to learn	How can I make this learning experience stimulating and interesting?
Relevance	Meeting the personal needs/ goals of the learner to effect a positive attitude	In what ways will this learning experience be valuable for my students?
Confidence	Helping the learners believe/ feel that they will succeed and control their success	How can I via instruction help the students succeed and allow them to control their success?
Satisfaction	Reinforcing accomplishment with rewards (internal and external)	What can I do to help the students feel good about their experience and desire to continue learning?

the context of motivation, attention means something different from when it is used in regard to instructional design and learning. In a learning context the concern is with how to manage and direct learner attention. This is done by using cues and prompts in such a way as to lead the student to focus on the stimuli or parts of stimuli that are specifically related to the learning objectives. But, before attention can be directed it has to be acquired and this occurs in the domain of motivation. Thus, the motivational concern is for getting and sustaining attention.

The next step is to ensure that the student believes that the learning experience is personally relevant. The student might ask the classic relevance question, ''Why do I have to study this?'', or an adult who was required to come to your training session might be thinking (or saying!), ''I don't need this. It doesn't apply to my job, and I have no interest in it.'' In both of these examples, the students do not perceive any personal relevance for the instruction. Even if a student does accept the need to learn the content, he or she might simply feel alienated from other students or the learning environment. Before students can be motivated to learn, they will have to believe that the instruction is related to important personal goals or motives and feel connected to the setting.

Even if the students in your audience believe the content is relevant and they are curious to learn it, they still might not be appropriately motivated due to too little or too much confidence, or expectancy for success. They could have well-established fears of the topic, skill, or situation that prevent them from learning effectively. Or, at the other extreme, they might believe incorrectly that they already know it and overlook important details in the learning activities. For these situations you have

to design the learning materials and environment, including the instructor's behavior, so that the learners become convinced that they can learn the content and experience actual success on an assignment.

If you are successful in achieving these first three motivational goals (attention, relevance, and confidence) then the students will be motivated to learn. Next, in order for them to have a continuing desire to learn, they must have feelings of satisfaction with the process or results of the learning experience. Satisfaction can result from extrinsic and intrinsic factors. Extrinsic factors are very familiar to us. They include grades, opportunities for advancement, certificates, and other material rewards. Intrinsic factors, although often overlooked, can also be very powerful. People like to experience accomplishments that enhance their feelings of self-esteem, experience positive interactions with other people, having their views heard and respected, and from mastering challenges that enhance their feelings of competence.

In summary, these are the four components of the ARCS model that encompass the major factors that influence the motivation to learn. These factors are related to two important questions that you must ask yourself as you are designing or preparing to teach a course. First, what will you do to make the instruction valuable and stimulating for your students? Second, how will you help your students succeed and feel that they were responsible for their success?

Research Support

The four motivational components are based on a general theory of motivation in relation to learning (Keller, 1983b), and on supporting studies from many areas of research on human motivation (for example, Brophy, 1981). Also, there are large numbers of specific strategies that can be used to achieve the appropriate motivational goals. In the process of developing the ARCS model, many of these were gleaned from practical guidebooks, observations, and published studies and inserted into the appropriate categories.

The ARCS model has been validated by numerous research projects and by other indicators of validity. For example, the extensive work of Wlodkowski (1984, 1999) provides concurrent validity in that it includes many similar strategies even though the general model is different. The practical utility of the ARCS Model has been supported in a field test (Keller, 1984), and by research studies in a variety of settings (Shellnut, Knowlton, & Savage, 1999). Theoretical validation has been provided by studies such as those of Small and Gluck (1994) and Naime-Diffenbach (1991). Over time, the strategies have been modified for specific kinds of instructional settings such as textual material (Keller & Kopp, 1987), computer-based instruction (Keller & Suzuki, 1988), and online instruction (Keller, 1999).

Subcategories and Major Supporting Strategies

Each of the four categories also has subcategories based on the major motivational variables subsumed by the categories. The subcategories are useful in diagnosing learners' motivational profiles and in creating motivational tactics that are appropriate for the specific problems that are identified. Following are descriptions of the subcategories and main supporting strategies for each part of the ARCS model. Additional, detailed descriptions are provided in subsequent chapters of this book.

Attention Getting Strategies

The attention category includes human characteristics such as the orienting reflex, curiosity, and sensation seeking. Each of these represents a specialized area of research which will be described in Chapter 4, but in spite of their differences, each of them helps explain factors affecting the arousal and duration of attention.

One important aspect of attention is its nemesis, otherwise known as boredom (Kopp, 1982). Sometimes, as in a quotation attributed to Dylan Thomas who said, "Someone is boring me. I think it's me," educators believe that the avoidance of boredom is primarily the student's responsibility. However, it is not totally up to the student to be self-motivated. No matter how interested the students are at the beginning of a class, it is possible to bore them if you try hard enough. We've all seen professors or trainers who lecture "full bore." To avoid this condition, there are specific kinds of activities that will help, and they tend to cluster into three general categories:

A1 Perceptual Arousal: What can I do to capture their interest?
A2 Inquiry Arousal: How can I stimulate an attitude of inquiry?
A3 Variability: How can I maintain their attention?

Perceptual arousal. This is a type of curiosity (Berlyne, 1965) that refers to reflexive reactions to stimuli. Almost any sudden or unexpected change in the environment will activate a person's perceptual level of curiosity. A change in voice level, light intensity, temperature, or a surprising piece of information as in Chicken Little's proclamation that the sky is falling, to use a less emotional example that could be taken from any one of many horrible headlines, will do it. Humor can also be used to arouse curiosity, but must be used with care. It can cause distractions rather than increasing interest in the subject matter. The arousal of perceptual curiosity is a first step in the attention process but it is usually transitory in that people adapt to the situation rather quickly. It needs to be followed up with the next stage of curiosity arousal.

Inquiry arousal. A deeper level of curiosity may be activated by creating a problem situation which can be resolved only by knowledge-seeking behavior. Instructors often do this by using a warm-up activity

that engages the learners in a problem-solving experiential situation and by the use of questioning techniques. Environmental design factors that evoke a sense of mystery are also good curiosity arousers. Kaplan & Kaplan (1978) have shown how curving paths that disappear behind an obstacle, partially revealed objects, and interplays of light and dark can stimulate curiosity and exploratory behavior. In instruction, these effects can be incorporated in multimedia design, furniture arrangements, and the use of presentation techniques such as progressive disclosure.

Variability. To sustain attention it is beneficial to incorporate variability. In a setting where there is little variation in the stimulus characteristics, regardless of whether it is a monotone voice or even a more irritating tick-tock of Grandma's clock, people adapt and tune it out. Instructors who use the same instructional approach repeatedly, even though it is a "tried and true" method, will benefit from variation. Typically, trainers move from a warm-up activity into a short lecture which is followed by a demonstration and an exercise. This is an excellent sequence, but can become boring when used unvaryingly. To diverge with a mediated presentation, a YouTube clip, or group processing activity would be a welcome change of pace.

Relevance Producing Strategies

Relevance is a powerful factor in determining that a person is motivated to learn. "How," the student is consciously or unconsciously wondering, "does this material relate to my life?" If the student has a good feeling about the personal meaningfulness of the material, or consciously recognizes its importance, then the student will be motivated to learn it. People most often believe that relevance refers only to the utility of what they are learning, as when the content of the lesson can be applied on the job or in "real life," but it also has other important components.

Relevance, in its most general sense, refers to those things which people perceive as instrumental in meeting needs and satisfying personal desires, including the accomplishment of personal goals (Keller, 1983b). Responding to people's perceived needs, which may or may not be congruent with their actual needs, is a cardinal principle of organizational success, especially in the fields of selling and marketing, and it is equally important in learning and instruction (Sperber & Wilson, 1986). A successful instructor is able to build bridges between the subject matter and the learner's needs, wants, and desires as represented in the various subcategories of relevance:

- R1 Goal Orientation: How can I best meet my learner's needs? (Do I know their needs?)
- R2 Motive Matching: How and when can I provide my learners with appropriate choices, responsibilities, and influences?
- R3 Familiarity: How can I tie the instruction to the learners' experiences?

Goal orientation. Setting goals and working to achieve them is a key component of relevance. Generally speaking, people will be more motivated to learn if they perceive that the new knowledge or skill will help them achieve a goal in the present or future. Goal orientation is frequently used by teachers and trainers who try to relate the benefits of their courses to college acceptance, getting a job, getting a raise, getting a promotion, avoiding getting fired, or improved job performance. This external goal orientation also applies to courses that are taken as prerequisites to other courses.

This type of utilitarian motivation is probably the single most influential relevance factor, and it is appropriate to build on it when possible. To do this, make sure the students understand how the concepts and skills are related to their goals. It might be clear to you, and it might become clear to them after they return to their jobs. However, to improve the perceived relevance of the instruction while taking the course, use authentic examples and assignments whenever possible; that is, use job-related examples, make sure the students see the connections between the concepts and the skills they are learning in the application examples, and ask the students to describe their own perceptions of the connections.

Sometimes, instructors will try to use goal-oriented or job-related relevance when it really is not appropriate. The connection between the instructional material and the student's future success may be loose and tenuous at best. In foundational courses such as geography or statistics, it might be extremely difficult to identify direct applications to the students' lives, especially if the learners, or trainees have been assigned to the course as a curriculum requirement that is unrelated to their goals. In these situations, when the instructor cannot generate meaningful utilitarian relevance, there are other ways to help establish feelings of personal relevance.

Motive matching. There are many different types of learning environments and students will differ with respect to the ones in which they feel comfortable or not. If students feel positive about the interpersonal structure and working relationships in a learning environment they will be more likely to feel a sense of relevance. Understanding the students' personal motive structures can lead to the development of compatible learning environments. For example, people who are high in the need for achievement motive enjoy defining goals and standards of excellence for themselves. They also like to have a great deal of control over the means of achieving the goal and to feel personally responsible for success. They are often uncomfortable in group work that requires consensus in planning and shared responsibility for the results.

In contrast, people high in "need for affiliation" enjoy being with other people in noncompetitive situations where there is more of an opportunity to establish friendly relationships and enjoy dialogue in collaborative learning activities. It is also possible for people to have a combination of the affiliation and achievement motives. They enjoy interacting and a degree of collaboration, but ultimately they like to have areas of responsibility that

are under their control. The point is, that the use of teaching strategies that include cooperative work groups combined with individual competitive activities such as games can help make the instruction more appealing independently of the content.

Familiarity. On the one hand, people enjoy unexpected and novel events as indicated in the section on attention and curiosity, but on the other hand they tend to be most interested in content that has some connections to their prior experiences and interests. At one level, familiarity can be as simple as including human interest language in textual information or human figures in graphics. Text which includes the use of personal pronouns and people's names is more interesting to people than third person or references to mankind in general (Flesch & Lass, 1949). At a higher level, instructional material that confirms the learner's preexisting beliefs and interests will be seen as relevant. In instruction, the use of concrete examples from settings familiar to the learner can help to achieve relevance, especially when teaching abstract material. Some ways to accomplish this are to stimulate personal involvement in the class. Learn and use the students' names. Ask for experiences and ideas from the students. Let them share "war stories" and "a-ha!" experiences.

Confidence Building Strategies

A desire to feel competent is a basic human motive and the degree to which one feels competent (White, 1959) in a given situation is reflected in one's feelings of confidence. Like the other major components of the ARCS model, confidence is a complex concept that encompasses several motivational constructs ranging from those that explain perceptions of personal control and expectancy for success to the opposite extreme which is helplessness (Keller, 1983b). There is also the problem of overconfidence which is detrimental to learning because the overconfident person believes that he or she already knows the given content or skills and does not pay attention to new information.

It is fairly common for teachers and trainers to underestimate people's anxieties about being able to learn in a formal school context because students are very good at masking their feelings and may appear more neutral than they really feel. This is one reason why it is important to provide success experiences for learners as soon as possible in a workshop or course. The success experience will be meaningful and will stimulate continued motivation if there is enough challenge to require a degree of effort to succeed, but not so much that it creates serious anxieties or threatens failure. There are several concepts and strategies that assist in building confidence:

- C1 Learning requirements: How can I assist in building a positive expectation for success?
- C2 Success opportunities: How will the learning experience support or enhance the students' beliefs in their competence?

C3 Personal control: How will the learners clearly know their success is based upon their efforts and abilities?

Learning requirements. How often have you been a student in the course or participated in a workshop where you really did not know what the instructor wanted you to learn or what would be on the examinations? This is not uncommon and is definitely a source of anxiety. Thus, letting the learners know what is expected of them is one of the simplest ways to help instill confidence. If the students have the appropriate level of ability and prerequisites for a given course, they will have a much higher expectancy for success if the performance requirements and evaluative criteria are made clear.

Letting students know what is expected of them does not mean that the instructor has to list precise and specific learning objectives and then teach to the test. When teaching students to conduct and report a review of the literature or to analyze and describe the common themes in several works of fiction, the instructor may expect an element of creativity that cannot be precisely defined in a learning objective. However, the instructor can define the criteria that would be used to determine the quality of the final product by describing the appropriate uses of evidence, use of logical and cogent arguments for key points, and so forth. Also, providing examples of other people's work will help instill confidence.

Success opportunities. After creating an expectation for success, it is important for the learners to actually succeed at challenging tasks that are meaningful. These success opportunities should be somewhat different for people who are just learning new knowledge or skills than for people who have gotten the basics and are trying to achieve mastery. Persons who are learning something new generally like to have a fairly low level of challenge combined with frequent feedback that helps them succeed or confirms their successes. After mastering the basics, people are ready for a higher level of challenge, including competitions that help them exercise and sharpen their skills. The challenges to the instructor and designer are to move people quickly enough to avoid boredom, but not so quickly that the students become anxious, and to adjust the pacing as the learners' competency levels change.

Personal control. Confidence is often associated with perceptions of personal control over being able to succeed at a task and the outcomes that follow success (deCharms, 1976; Rotter, 1972). Yet, in a learning setting, the control is often clearly in the hands of an instructor. To enhance motivation, the controlling influence of the instructor should be focused in the areas of leading the experience and adhering to the standards that are expected. This provides a stable learning environment in which the learner should be allowed as much personal control over the actual learning experience as possible.

This can take many forms. The use of experiential learning activities and other methods that require the learner to do problem solving provide

situations in which the learner has to exercise personal control to succeed. Something as simple as using a short-answer test instead of a multiple-choice test gives the learner more control by showing that you are willing to consider a variety of responses.

To help students improve their confidence, provide corrective feedback that helps them see the causes of their mistakes and how to take corrective action. This helps the instructor and the students to maintain a task orientation in which it is perceived to be okay to make mistakes and learn from them. When students get no feedback until they see their final, summative score or comments, the students' perceptions of control decrease and they become more focused on trying to please the instructor instead of understanding the task. This can cause the instructional culture to shift from task involvement to ego involvement (J. Nichols, 1984). An ego-driven culture is one in which people want to avoid or hide errors so they will look as good as possible to the instructor and other students. On the surface, there might be a high level of accomplishment, but underneath there is usually an increase in anxiety, a decrease in confidence, and a decrease in real learning. Another simple strategy is to give the learner attributional feedback that supports effort and ability as the causes of success. Tell the learner such things as, ''See! You did it on your own. I like the way you came up with a solution to this problem.'' Do not say things such as ''You really lucked out on that one,'' which suggest that success (or failure) was due to things the learner could not control. Also be careful about body language. Both verbal and nonverbal messages will influence the learner's self-confidence.

Satisfaction-Generating Strategies

How many of the following outcomes would give you satisfaction at the end of a class:

- To finish a course and have the satisfaction of being one step further along your goal-path?
- To receive an award or a certificate for the achievement?
- To have acquired a useful set of skills or body of knowledge?
- To have enjoyed working and socializing with other people?
- To have received a tangible reward such as more pay, time off, gift certificates to the bowling alley?
- To have been stimulated by feelings of challenge and accomplishment?

All of the above can be satisfying for some learners, at least some of the time. However, the misuse of these outcomes can be very unrewarding. The final step in the motivational process is to create satisfaction so there

will be continued motivation to learn, and positive recommendations of the course to other people. The three categories of strategy in this section provide guidance in determining what kinds of strategy to use to promote satisfaction.

S1 Natural consequences: How can I provide meaningful opportunities for learners to use their newly acquired knowledge/skill?
S2 Positive consequences: What will provide reinforcement to the learners' successes?
S3 Equity: How can I assist the students in anchoring a positive feeling about their accomplishments?

Natural consequences. For a student to be able to successfully perform a challenging task at the end of a class that he or she could not do at the beginning is a very satisfying experience. One of the most rewarding results of performance-oriented instruction is to use the newly acquired skills or knowledge. If the relevance of the course has been previously established, and the student has application opportunities, then the student's intrinsic motivation will be high and there will be less of a requirement for extrinsic rewards. Case studies, simulations, and experiential learning activities can be excellent vehicles for providing meaningful application opportunities.

Another type of natural consequence that supports learners' intrinsic motivation is praise if it is used properly. If praise focuses on specific aspects of performance that are praiseworthy, then students will feel good about this genuine appreciation of their work.

However, it isn't always possible to put the new knowledge or skills to use immediately. There is sometimes a fairly long process of learning specific bits of knowledge and skills before they become a useful package. Also, praise isn't always sufficient in order for students to have an overall feeling of satisfaction. Typically, students are taking courses for extrinsic reasons to become qualified for certificates and degrees or because it is a requirement of their job. Thus, it is also important to use extrinsic rewards appropriately to reinforce the development of new skills and for students to feel good about fulfilling their requirements.

Positive consequences. Incentives in the form of awards, monetary bonuses, trophies, and special privileges are satisfying outcomes for the people who receive them, providing they are used appropriately according the established principles of using reinforcements to stimulate, shape, and maintain behavior. These types of outcomes are useful when learners are not intrinsically motivated, when the learning task is inherently monotonous as in drill and practice exercises, and in situations that are highly competitive. However, a challenge to teachers is that schools seldom provide resources for extrinsic rewards of any substantial value. However, inexpensive, symbolic rewards such as certificates, school supplies, or items monogrammed with a corporate logo can be quite effective in providing external recognition of accomplishment.

Seldom, if ever, is it appropriate to use only intrinsic methods or only extrinsic methods. Even when people are intrinsically motivated to learn the material, there are likely to be benefits from extrinsic forms of recognition. For example, public acknowledgment of achievement, privileges, student presentations of products, and enthusiastically positive comments are generally welcome. A primary issue is control. Learners like to have some feeling of control over their situation and to see the various pieces fitting into a whole. At the same time, people appreciate the external recognition that helps support the value of what they are doing.

Equity. Sometimes a person will feel very good about the outcomes of an achievement until he or she finds out what someone else received. If the other person's outcomes are perceived to be greater but their task accomplishment to be less, then satisfaction quickly turns into disappointment or even stronger negative emotions. People do not look at rewards in isolation, or in terms of their absolute value, which is often difficult or impossible to assess anyway. People tend to make comparisons with other people and with their own expectations. For example, an instructor could accomplish the course goals very satisfactorily, but if the outcomes were not what the students were expecting, student satisfaction would be low. Similarly, a student might achieve a new "personal best," a score that is higher than any he or she ever achieved before. But, if it is lower than someone else's with whom the student was making a personal comparison, satisfaction might still be low.

The best way to handle the problem of equity is to ensure that course outcomes are consistent with initial presentations and discussions concerning purpose and expectations and to maintain consistent standards and consequences for task accomplishment. It is possible to make exceptions for people with unusual circumstances, but these people should not receive special recognition or awards at the expense of those who have excelled under the normal requirements.

Relationships Among the Categories

The ARCS model provides a typology that helps designers and instructors organize their knowledge about learner motivation and motivational strategies. Motivational interventions can be focused within one of the four categories of the model or even within one of the subcategories. For example, the use of a metaphor to connect unfamiliar material to a familiar experience, such as comparisons of electrical circuitry to a plumbing system, could be restricted to Subcategory 3, Familiarity, under Relevance. But, motivational strategies are not always limited in this way. More often a motivational activity will have several effects. For example, at the beginning of a Coast Guard training lesson on how to rig a sling for helicopter rescues the instructor could show a short video of a successful rescue that depended on the use of this sling. This strategy could affect three different areas of motivation by stimulating curiosity, demonstrating the relevance of

the lesson content, and providing a vicarious feeling of satisfaction to the students. However, the process might appear to be dangerous and complicated which means that the instructor would need to include a confidence building strategy right away.

Some strategies might extend over several lessons. For example, in a course on quality improvement, let's assume that the designer and instructor decide to prepare a case study which allows the students to apply the course's abstract concepts and procedures to a concrete business situation. To enhance relevance, the case is built around a hypothetical financial organization similar to the institution in which the students are employed. But, if the case exercise also contains an attention getting device at the beginning, contains corrective feedback on the various decisions that are made, and the solution to the problem provides a satisfying sense of accomplishment then not only has the primary concern for relevance been served, but the other requirements of motivation have also been met.

Even though it is expected that any complete instructional method, lesson, or course should fulfill all of the motivational requirements, there will be some situations where a specific type of motivational intervention is required. For example, a technical course might be obviously relevant to newly hired workers, and the course might be achievable. But, the content might be inherently boring, because it is highly procedural and involves very little problem solving or human interaction. In this case, the designer and instructor will have to devise learning schedules, contests, unexpected events, and other activities that are focused almost exclusively on the problem of maintaining attention.

Thus, the four categories defined by the ARCS Model answer the first question posed in the *Introduction* to this chapter regarding an understanding of motivational concepts. These categories of motivational variables help you understand the major components of the motivation to learn and provide guidance for generating strategies to use for each category. But, by themselves the categories do not tell you how many or what types of strategies to use or how to design them into the instruction. These decisions are made during the systematic design process.

The Systematic Process of Motivational Design

In addition to the synthesis and classification of motivational concepts, the ARCS model contains a *systematic motivational design process*. A basic assumption of the ARCS design process is that it is a problem-solving process, not a prescriptive process. That is, it is assumed that in most situations it is not possible to have a prescribed set of strategies or sequence of strategies to implement. At an abstract level it is possible to formulate principles and overall strategies that can be prescribed for creating motivating learning environments, but it is not possible to give concrete, generalizable prescriptions for what will motivate a specific audience in a

particular setting at a given time. There is too much variability among the attitudes, values, and expectancies of learners. This leads to a second assumption of the ARCS design process which is that a problem-solving, heuristic approach to motivational design is more appropriate than prescriptive and algorithmic approaches. In the future as increasing amounts of knowledge about motivational design are accumulated perhaps it will be possible to create precise diagnostic tools that lead to concrete tactic prescriptions. But, because of the many situation-specific factors that comprise learner motivation, it is questionable as to whether prescriptive models can be totally successful.

The design process that is contained here is based in system thinking and follows a systematic problem-solving process. A critical success factor in this process is audience analysis which provides the basis for answering the second question in the *Introduction* to this chapter which was concerned with how many and what kinds of motivational strategies to use and how to design them into a lesson or course. Even though this process will help you be more systematic, do not expect it to be completely mechanical or algorithmic; it still requires judgment and benefits from experience, intuition, and creativity.

Motivational Design

The motivational design process, which is similar to the traditional instructional design process, has 10 activities, or steps. The "waterfall" diagram in Figure 3.2 portrays the 10 steps and lists the primary activities associated with each step.

The first two steps in the process consist of obtaining information about the instructional goals and content, the audience, and any other information that will assist in the analysis and design process (see Chapter 8 for detailed explanations and procedures). Then, the next step (Figure 3.2, Step 3) consists of audience analysis which is of particular importance in motivational design and is analogous to task analysis and instructional analysis in instructional design. This analysis helps identify what the motivational problems are. It is assumed that it will be necessary to incorporate motivational tactics in a course to sustain learner motivation, but the most important requirement for successful motivational design is to determine what kinds of major problems there are, if any, that will require specific motivational enhancements to bring learners to an appropriate level. Step 4 is also an analysis step but it focuses on the instructional materials and other aspects of the learning environment to determine whether they have appropriate motivational characteristics and do not have inappropriate ones. The presence of inappropriate strategies can be demotivating. For example, students may become annoyed if you use a series of activities to convince them of how important a lesson is if they already know that it is important. The outputs of Steps 3 and 4 provide input information for formulating motivational objectives and assessments (Step 5).

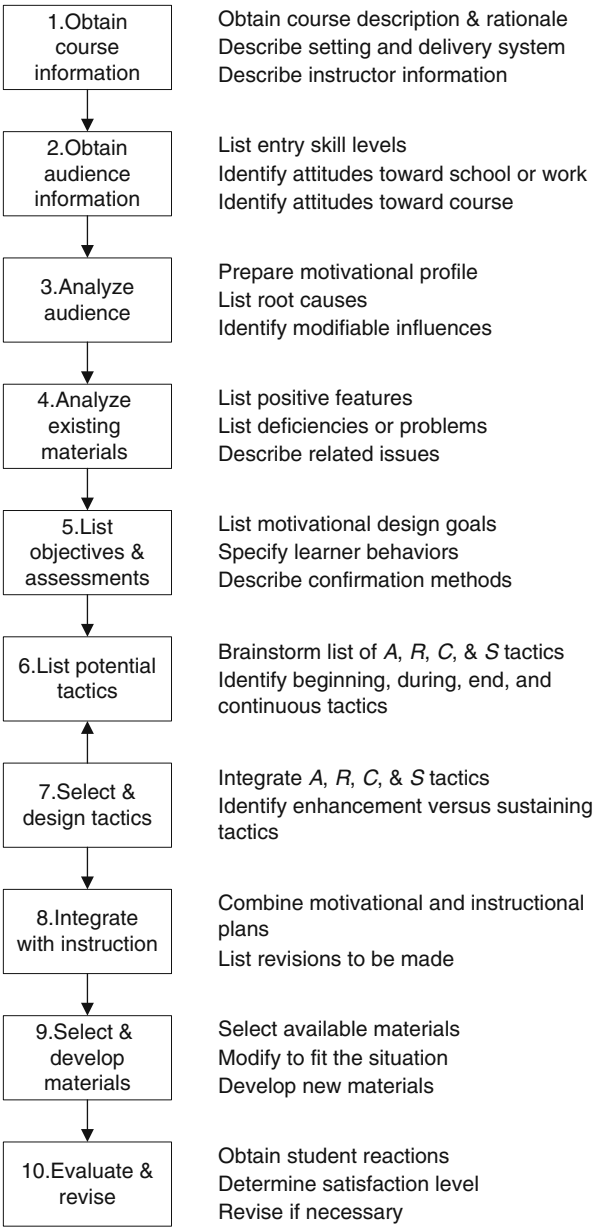

Figure 3.2. Steps in the ARCS Motivational Design Process.

The design and development phases are somewhat different from instructional design in that motivational design usually involves the enhancement of an already existing instructional product or learning environment or of a design document that already contains the instructional blueprint. If the instructional design specifications have already been determined, the question for the motivational design steps is how to create experiences that will fulfill the requirements that were identified in the analysis phase. Consequently, the motivational design phase generally begins with brainstorming, or another type of open-ended activity to generate a large number of possible solutions (Step 6). Subsequently, these are analyzed and the most feasible strategies are chosen (Step 7) and integrated into the instructional materials (Step 8).

After the motivational materials are acquired or developed (Step 9) it is appropriate to conduct a developmental try out, which Dick and Carey (1996) call ''one-on-one'' formative evaluation. When the materials are ready for a formal test, the final, integrated package of instructional and motivational materials are implemented in a pilot test or in the first offering of the course (Step 9) and formative evaluation is conducted (Step 10) before the materials are released from development for formal implementation.

These steps can also be listed as a set of activities subdivided into four phases based on the purpose of each activity (Table 3.2) as illustrated by the general questions listed for each activity. This ten-step process provides a comprehensive design model that is especially useful if you are designing a whole course or a section of a course that includes several lessons and when a team approach is used. The steps and documentation among team members facilitates communication and replicability in future projects. However, there is a simplified version of this process (see Chapter 10) that is useful when developing a single lesson or even several lessons when they are being motivationally enhanced by the instructor and subject matter expert.

The steps in the model can encompass many specific and complex activities, but in most training situations each step can be performed in a simple, straightforward manner to improve the motivational appeal of the course. Each step in the model is described in detail in Chapters 8, 9 and 10, but the following pages contain a brief elaboration of the process. This will provide a useful frame of reference as a foundation for Chapters 4, 5, 6 and 7. Following is a slightly more detailed overview (with a special emphasis on audience analysis) of how the motivational design process is conducted.

Audience Analysis

Audience Analysis provides the basis for the rest of the motivational design process. It is recommended that audience analysis be conducted prior to the beginning of a class while it is still being designed. This will

Table 3.2. Motivational Design Activities and Process Questions.

Activities	Questions
DEFINE	
1. Obtain course information	What are the relevant characteristics of the current situation including course description, rationale, setting and instructors?
2. Obtain audience information	What are the relevant characteristics of the audience, including entry-level skills and attitudes toward job and training?
3. Analyze audience motivation	What are the audience's motivational attitudes toward the course to be offered?
4. Analyze existing materials and conditions.	What kinds of motivational tactics are in the current materials or other source materials and are they appropriate?
5. List objectives and assessments	What do I want to accomplish with respect to the motivational dynamics of the audience and how will I know if I do?
DESIGN	
6. List potential tactics	How many possible tactics are there that might help accomplish the motivational objectives?
7. Select and/or design tactics	Which tactics seem to be most acceptable for this audience, instructor, and setting?
8. Integrate with instruction	How do I combine the instructional and motivational components into an integrated design?
DEVELOP	
9. Select and develop materials	How do I locate or create motivational materials to achieve the objectives?
PILOT	
10. Evaluate and revise	How can I detect the expected and unexpected motivational effects of the course?

allow the designer to anticipate the students' attitudes at the beginning of the class and to be prepared with the appropriate motivational tactics. Motivational analysis can also be conducted while a course is in progress to determine whether there should be adjustments to the motivational strategies.

The audience analysis is conducted by estimating student motivational levels for each of the 4 major categories of the ARCS model and for any of the 12 subcategories that might assist in developing an accurate profile of the learners. In keeping with the curvilinear nature of motivation, students can be too high or too low with respect to any of these motivational dimensions. For example, if students are too low in the attention category, it is probably an indication of boredom, but if they are too high they are probably going to be hyperactive. Thus, the audience analysis provides guidance on what types of strategies to use and also when it isn't necessary to enhance the motivational properties of the class.

The audience analysis can be based on several types of data ranging from a ''best guess'' estimate based on the designer's or instructor's personal experience to a judgment based on data collected from the students themselves. If more formal data are not available, even a ''best guess'' method can be extremely beneficial because it requires you to break away from the broad, general assumptions about the learners' motivational attitudes by carefully considering their attitudes with respect to each of the categories and even subcategories of the ARCS model. The subcategories of ARCS and associated ''process questions'' listed above are useful in this regard. If, due to lack of sufficient experience with or knowledge of the audience, a ''best guess'' method is not adequate, then it would be advisable to conduct interviews with members of the target population or other informed persons. Here again, the process questions associated with each subcategory can be used as guidelines for conducting interviews. Additional details about this process are contained in Chapter 8.

The results of the audience analysis are normally summarized in written descriptions, but they can also be portrayed on a diagram of the inverted U-curve that was introduced in Chapter 2 (Figure 2.3). An example (Figure 3.3) illustrates a frequently occurring profile for newly hired employees in a technical course and who have no prior knowledge or experience with this technical area. The students will enter the course knowing that it is relevant to their jobs. Also, due to the selection process most of them will be reasonably confident that they can achieve the objectives although some will have concerns which is why *C* is located on a line indicating the range of likely attitudes, and they expect to have a good feeling about completing the course successfully. But, many will regard the subject matter, which is highly factual and procedural, as essentially boring to learn. However, it is always important to assess the actual attitudes of prospective learners and not take stereotypical examples such as this for granted.

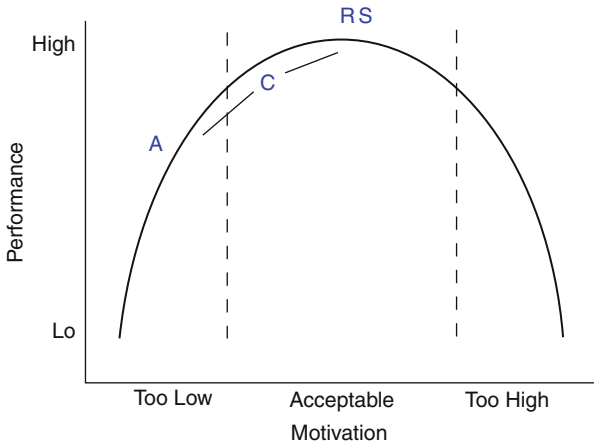

Figure 3.3. Graph of Audience Analysis Results.

A slightly different profile resulted when the author and his associate conducted an analysis of the expected audience at a session of an ISPI (International Society for Performance Improvement) annual meeting. First, we prepared verbal descriptions of our predictions (Table 3.3) and then plotted them on an inverted-U curve (Figure 3.4). This was a "best guess" analysis based on the experience of the two presenters (Keller & Kopp, 1987) with ISPI and similar conferences. Feedback from the audience confirmed that the analysis was accurate. However, it is also true that the

Table 3.3. Description of Anticipated Audience Motivation at a Professional Meeting.

Attention	Initially high. The audience will be very attentive at first, but will require changes of pace and participative activities to sustain attention.
Perceived relevance	Initially moderate to high. Since this is a volunteer audience, they will believe that the topic of motivation is important, but they will have concerns, even skepticism, about whether they will get something useful from this session.
Confidence	Some will have genuine concerns about their ability to motivate others, some will believe they can do it if they learn some good techniques, and others will already be skilled motivators, but they just want to check us out.
Satisfaction potential	Positive. If they find something applicable in the session, and are neither bored nor confused by the presenters, then they will feel that it was a useful 45 minutes.

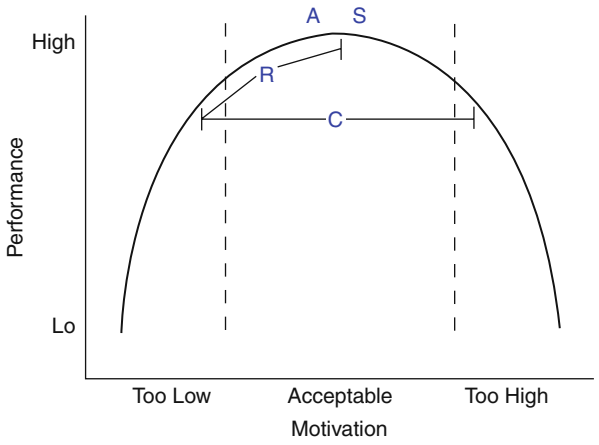

Figure 3.4. Illustration of Audience Motivation at a Professional Meeting.

results of this analysis are fairly general and could apply to many audiences at professional meetings.

The decision as to how specific to be will depend on the criticality of the decision, the anticipated obstacles, and the consequences of failure. For example, in preparing to meet with a captive audience the presenter might face hostility and risk being a scapegoat for the audience's irritation. In this case, the audience analysis is more critical; the presenter will have to give extra effort to identifying audience characteristics that will help in gaining attention to the learning process and establishing meaningful relevance.

In summary, the audience analysis provides an indication of what types of motivational strategies to use and where to place the greatest emphasis. In some categories, it may not be necessary or desirable to add any motivational strategies because you should never try to motivate an audience that is already motivated; just get on with the instruction and do not de-motivate them. For example, if the relevance of the material is clearly established in the students' minds before they ever set foot in the classroom, then do not add lecture material or exercises designed to establish relevance. It takes up valuable instructional time and irritates them. Instead, simply include a few comments to confirm the relevance of the material and use work-related examples and exercises.

Motivational Objectives

After completing the audience analysis and other analyses that might be relevant (Chapter 8), the next step is to list motivational objectives. These are your project objectives and might not be exactly the same as your affective objectives for the learners themselves. For example, if you anticipate that the learners will feel anxious and have a high fear of failure

when they begin your class, you could write an objective that specifies that at the end of the first 30 minutes of training learners will have a more positive expectation for success in this class.

With respect to the preceding example of an analysis of an anticipated ISPI audience, specific motivational objectives were written for confidence and relevance (Table 3.4), but not for attention because the audience did not indicate that attention would be a problem at the beginning of the presentation. Certainly, strategies were used to sustain curiosity, but it was not considered to be a problematic area. However, even though a given category of motivation might not be considered to be a problem for the audience, the presenter might find it beneficial to prepare objectives for the given area, such as stimulating attention and curiosity, especially if the presenter is inexperienced or uncertain about what to do. The criterion for determining how many objectives to write is a pragmatic one. If the designers or presenters believe it will be useful based on the analyses and their personal experience to write a particular objective, then they should do so. It is better within reason to have too many than not enough but without reaching a level of detail where they become trivial and unnecessarily costly.

Table 3.4. Motivational Objectives and Measures.

Objectives	Self-Report measures
Participants will indicate a higher degree of confidence in their ability to conduct motivational design.	My confidence in my ability to conduct motivational design has. a. Improved quite a bit b. Improved somewhat c. Stayed the same d. Not applicable (I didn't do enough of the pretest and/or exercise to have an opinion.) e. Other (Please describe.)
Participants will indicate that the session was interesting and worthwhile.	Overall, I found this session to be: (Check the lines where appropriate.) Interesting _____Boring Worthwhile _____Waste of Time

Motivational Measures

As in any type of project activity, it is useful to know if you have achieved your goals. When deciding what measurement methods to use and preparing the materials, it is possible to use the full range of measurement

possibilities. These can range from direct observation of specified behaviors to self-report questionnaires. Straightforward self-report measures (Table 3.4) can be very useful when they focus on an identified area or concern. The important point, as in any measurement situation, is that the measures are consistent with the objectives and that the effects of bias can be taken into consideration in interpreting the results.

Motivational Strategy Design

It is not uncommon for designers or instructors, after they have developed their lesson blueprints, or lesson plans, to then reflect on what they can do to motivate the students and to then prepare a list of ideas. In this ARCS process, it is also appropriate to make lists of ideas, but it does not occur until all of the preceding steps have been taken. The importance of taking time for audience analysis has been empirically confirmed (Farmer, 1989; Suzuki & Keller, 1996). When designers do not conduct an adequate analysis and then apply the results to the final selection of strategies to use, they frequently incorporate too many and inappropriate strategies.

The strategy design phase has three steps which can be enjoyable, incorporating both creative and analytical thinking, if it is not rushed. The three steps are generation, selection, and integration.

The generation step is like brainstorming. The goal is to think of as many ways as possible to accomplish the motivational objectives. Look through other training materials, review published resources, recall examples from workshops you have attended, and talk to other people. Consider various types of material and strategies, such as cartoons, case studies, role plays, and experiential activities, which tend to promote interest and involvement. The point is to be in an open, creative frame of mind as you generate possibilities.

After assembling some ideas, it is time to be more analytical and to begin the selection process. It is important to consider the time and cost associated with incorporating any of the strategies, and to consider the personal styles of the instructors and students who will be associated with this course. It is also important to determine whether the motivational strategy will contribute to accomplishing the learning objectives. Some participative activities can be extremely clever and engaging while they are in process, but if the instructional effects are trivial, then the audience will be irritated and will become cynical of future efforts to use similar methods.

The third step is integration. After the motivational strategies have been chosen, it is time to adapt them to the specific setting and to write them into the instructional design plan. This also provides an additional opportunity to determine whether the motivational strategies are going to use an appropriate amount of the instructional time, and whether they will be internally consistent with the content and structure of the instruction.

Development and Pilot Test

During the development phase, the motivational material is prepared in conjunction with the instructional material. In fact, the distinction between the two often becomes blurred. A single activity, such as a case study introduced in the early part of the course, can help establish relevance at the same time that it is illustrating a concept or procedure.

When the materials are pilot tested, it is again important to think about motivation separately from instruction. The motivational criterion measures should be implemented along with the achievement measures and other indicators of course effectiveness that are used during the formative evaluation. If the motivational results are not what you hoped for, then respond as you would to deficits in instructional effectiveness, and begin to work on revisions.

Integration of Motivational Design and Instructional Design

The motivational design process is structurally similar to the traditional instructional design process and there have been several attempts to illustrate how they can be coordinated. Keller (Keller, 1983b, 1987c) described a way of coordinating them by illustrating how most of the activities in the two processes can be conducted in parallel (Table 3.5). The instructional design model depicted in the left-hand side of Table 3.5 is reasonably generic, particularly in regard to the sequence of steps. Some models distinguish between Define and Analyze as phases; others place Objectives under Design instead of Define or Analysis. However, these differences do not alter the basic relationships between the two processes under discussion.

As illustrated (Table 3.5), the audience motivational analysis can be conducted concurrently with the analysis activities in the instructional design process. Although individual designers will adapt models to suit their style and situation, the motivational analysis would normally occur after conducting the instructional analysis. Having identified the general body of knowledge or skills that the students are supposed to learn, it is time to estimate their motivational attitudes toward the material. Background information about the audience may have been obtained earlier when conducting a job or task analysis, but the actual analysis of the information is most effective after the instructional analysis is conducted. The results of the audience analysis can influence decisions about the learning objectives in addition to providing input to the writing of motivational objectives.

The interfaces during the Design and Develop phases are straightforward, and they involve parallel but different activities. The exception is developmental testing which is a formative evaluation activity. The drafts of the instructional materials, including the motivational enhancements, are presented to experts and representatives of the target population to

Table 3.5. The Parallel Processes of Motivational and Instructional Design.

Phase	Instructional Design steps	Motivational Design Steps
Analyze (define)	Pre-project analysis	
	Conduct task, job, or content analysis	
	Conduct instructional analysis	
	Identify audience entry behaviors	Conduct audience motivational analysis
	Write performance objectives and criterion measures	Write motivational objectives and criterion measures
Design	Design instructional sequences	Generate motivational strategies
	Instructional methods	Select strategies Integrate motivational and Instructional strategies
Develop	Helping the learners believe/ feel that they will succeed and control their success	Select or create Instructional materials Prepare motivational materials
		Enhance instructional materials
	Developmental test for learning and performance ("one-on-one" tryouts)	Developmental test for motivation
Implement & evaluate (pilot test)	Implement with target population representatives Conduct formative evaluation Certify or revise	

obtain feedback about the accuracy, clarity, time requirements, and effectiveness of the materials. At the same time, feedback should be obtained about whether the materials are appealing to the learners in terms of content and appearance (''Do the learners react positively to the 'look and feel' of the materials, whether in print or online?'') and whether the motivational activities are feasible.

During the pilot test, or small group tryout (Dick & Carey, 1996), the entire package is implemented and formatively evaluated. The critical point here is to include formal assessments of the motivational effects of the instruction in addition to measures of learning and performance. This is commonly done with simple, ''smiley face'' types of self-report measures.

These can be valuable, but their value will be enhanced by having them correspond to the critical problem areas of motivation as defined during the audience analysis.

A final point is that the relationship between the two sequences in Table 3.5 should not be viewed as a formal prescription. In fact, the portrayed relationship is probably more representative of the expert than the novice designer. A novice designer, particularly one who has never given much thought to systematic motivational design, may choose to complete all of the instructional design steps prior to working on the challenge of motivational enhancements. This allows the designer to assess the entire instructional package in terms of its appeal to the target audience and to enhance it as appropriate. With experience, it becomes more efficient and effective to combine the two processes.

A different approach was taken by Main (1993). Recognizing the lack of motivational concerns in instructional design, he proposed that motivational design can be integrated into instructional design as shown in Table 3.6. In this approach, instructional designers need to ask about A, R, C, and S components simultaneously in every phase of the instructional design process. That is, ''the ARCS model provides a framework for motivation considerations in each of the five phases'' (p. 39). This means that there is an integration, which makes it difficult to distinguish instructional design process from motivational design process.

Table 3.6. Integrating Motivational and Instructional Design (Adapted from Main, 1993).

Motivational Categories	**Instructional Design Phases**				
	Analysis	Design	Development	Implementation	Evaluation
Attention Relevance Confidence Satisfaction					
	Validation and Feedback				

Okey and Santiago (1991) also proposed that motivational design in accordance with the ARCS model be incorporated into instructional design following the process of Dick and Carey's instructional design model (Figure 3.5). They described how the phases and activities of motivational design can be integrated into the procedures of instructional design, but in comparison to Main (1993), it would be more appropriate to say that

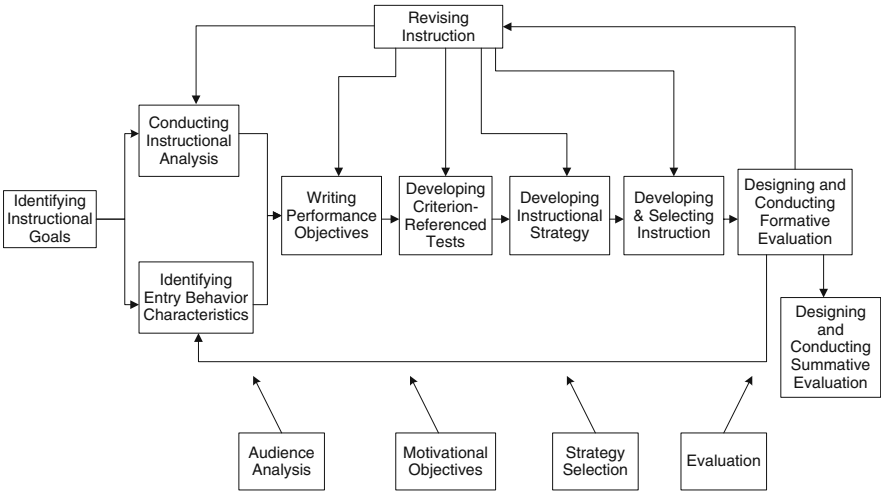

Figure 3.5. Relationships Between Motivational and Instructional Design (Based on Okey & Santiago, 1991, p. 18).

their approach incorporates motivational design into instructional design. In Main's approach, consideration is given to the four components of motivation throughout the instructional design process, but he does not specify particular motivational design activities such as audience analysis which is somewhat different from analyzing audiences with regard to entering level knowledge and skills. In contrast, Okey and Santiago described how motivational design activities can be put into the process represented by the Dick and Carey model and they discussed how this could be done.

ARCS and ISD: Point-by-Point Comparisons

A limitation of the Okey and Santiago approach is that the connections between the motivational and the instructional design processes are defined only loosely. However, it is possible to be more precise in describing the interfaces between the ten steps in the ARCS design process and the instructional design process.[1] For example, eight key interfaces are illustrated in Figure 3.6. One could specify even more interfaces but these eight represent the most important ways in which the two models can be symbiotically related to each other. However, before describing these interfaces, it is helpful to point out that both processes draw upon the same base of

[1] I am grateful to Dr. Sang Ho Song who created an earlier version of this point-by-point comparison approach while he was working with me as a graduate student. I have modified it considerably, but appreciate his contribution of this idea.

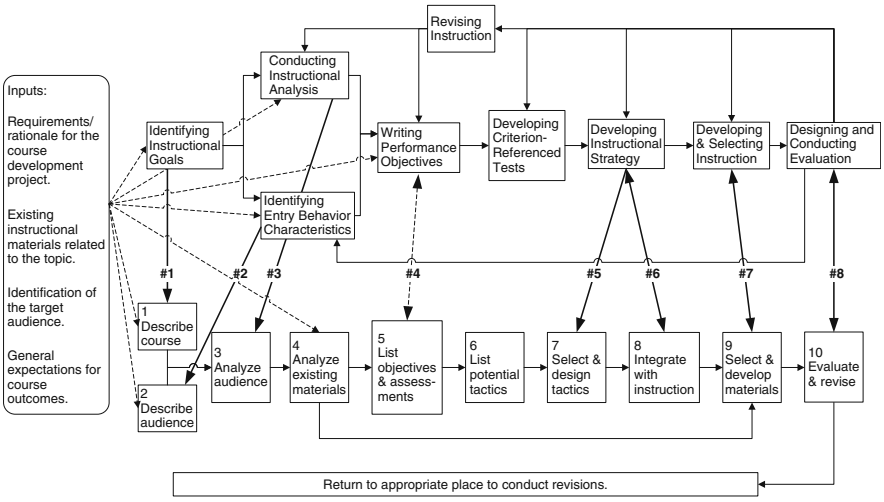

Figure 3.6. Point-by-Point Interfaces Between Motivational and Instructional Design Processes.

input information which usually includes information about the rationale for the course development project, existing materials related to the course to be developed, who the target audience is, and what the general expectations are as to what the course is supposed to accomplish.

Interface 1: Instructional Goals and Course Description

In instructional design, the output of a goal analysis includes a description of the current situation, a description of the desired situation, and a listing of gaps between the way things are now and the way you want them to be. In particular, the output of goal analysis describes the kinds of job-related competencies that must be represented in the workforce in order for the organization to achieve its goals. In a school environment, desired competencies are described more in the context of the requirements for students to be able to succeed at the next stage of schooling and in terms of the development of life skills that are appropriate for the given age level to help them in the present and future.

Interface 1 illustrates that the first stage of motivational design has a similar aim, but the focus is more on factors in the environment that are related to problems in the attitudes of learners or workers and the environmental factors that will influence the kinds of change strategies that will be feasible. The output of this first phase will provide guidance to the motivational designer as well as the instructional designer throughout the design process with respect to problems, goals, and practical decision- making regarding the selection and development of strategies.

One benefit of conducting this preliminary analysis is that designers can review the rationale for the course or other intervention that is to be developed to determine why there is a desire for it. In applied settings, education is usually directed at improving knowledge, skills, and attitudes that will lead directly to improved performance on the job. However, courses are also offered in applied settings for enrichment instead of the development of specific skills. In this case, they are usually called development courses rather than training. And, courses are also taught for such reasons as

- someone requires that they be taught, without reference to documented needs,
- they are part of a logically structured curriculum, or
- they are just a tradition (''our curriculum wouldn't be complete without it'').

It is certainly helpful during the design process to know why a course is being developed so that the content and the motivational tactics and strategies can be consistent with the basis for the course.

Another benefit of this preliminary investigation is that the designer can obtain useful information from a variety of people and other information resources such as literature, instructional materials, students, teachers, employees, employers, subject matter experts (SMEs), administrators, staff members, vendors. This information can help them discover insightful ways to address the possible motivational problems when they get into the design phase of the process.

Interface 2: Entry Behavior Characteristics and Audience Description

Two major products are expected from the stage of ''Identifying Entry Behaviors and Characteristics.'' One is a set of identified entry behaviors or skills that should have already been mastered by the target audience before beginning the instruction. The other is general knowledge of characteristics of students.

Identifying entry behaviors is important because it will give motivational designers more ideas on dealing with learners' motivation—especially confidence. We can easily notice that students with deficiencies of prior knowledge and skills will have difficulties in learning new material that goes beyond their existing schema. Therefore, information about students' prior knowledge can be used to determine how to bridge the new knowledge to be learned with what already exists.

Interface 3: Instructional Analysis and Audience Motivational Analysis

The instructional analysis phase of instructional development yields a description of the knowledge, skills, and attitudes that are related to the

goals of the lesson or course. This product can be quite specific with detailed listing of steps in a process or a hierarchical presentation of higher and lower order concepts and skills to be included. Also, by knowing what the students are expected to learn, you can begin to estimate their motivational attitudes toward learning it.

The audience motivational analysis step also benefits from the knowledge about entry behavior characteristics combined with the other information contained in the Describe Audience step, which is Step 3 in the motivational design process. Trying to determine what the students' motivational attitudes will be at the beginning of instruction will depend in part on how competent and knowledgeable they are with regard to the lesson content. However, even though this information is useful, audience motivational analysis also includes other elements pertaining to the audience's past attitudes toward the subject matter and the results of peer group influences.

Interface 4: Coordinating Instructional and Motivational Objectives

It is desirable that Step 5 of motivational design (List Objectives and Assessments) be conducted concurrently or right after the ''Writing Performance Objectives'' stage of instructional design. There are two reasons for this. First, having appropriate levels of motivation greatly assists the accomplishment of the learning objectives. Also, good motivational objectives can help overcome deficiencies with the learning objectives and content of a class. In actual classrooms or training situations, the objectives of the instruction are not always clear and the content is sometimes not useful or necessary for the students to know. Even if things were done properly during design, they are not always executed properly. But, if the students are sufficiently motivated they are more likely to persevere in the face of instructional design challenges.

Interfaces 5 and 6: Designing Instructional and Motivational Strategies

It is sometimes assumed by instructional designers that the time to consider the motivational aspects of a design is when the instructional strategies are being developed (Dick & Carey, 1996). Although this approach might have positive results much of the time, it could also have negative results. If the appropriate motivational analysis has not been conducted, it is easy for instructional designers to add too many motivational strategies that are not related to specific motivational problems. Also, the process for designing motivational strategies is quite different from specifying instructional strategies.

The selection of instructional strategies is often a somewhat logical and prescriptive process based on the nature of the instructional objective. For example, if a student must recall specific items of knowledge or steps in a

procedure, then an instructional strategy that includes memorization is appropriate, but if the instructional objective requires selecting and applying an appropriate procedure to solve a problem, then a problem-solving case study would be appropriate. But, the selection of motivational strategies to accomplish a goal of stimulating curiosity or improving confidence is not so straightforward. The motivational strategy design process begins with brainstorming to identify as many strategies as possible that might help achieve the desired outcome. Then, in a second phase of strategy design, one develops an analytical attitude and chooses strategies that can be achieved within the time constraints of the lesson and not detract from the instructional objectives. And, to the fullest extent possible, the motivational strategies should be transparent. For example, when beginning a lesson on troubleshooting in an electronics course, especially when the learners do not believe they should even have to take the course because they expect test equipment to tell them exactly what to do, the instructor could begin with a case study that requires the students to figure out how to proceed when the automated test equipment is broken. A case study based on an experience from real life can be motivating by building curiosity and relevance at the same time that it illustrates how the instructional content will be used.

As the final list of motivational strategies is occurring, the final step in the design stages of instructional and motivational development is to integrate motivational tactics into the instructional strategy (Step 8, Figure 3.6). So far, motivational tactics themselves have been selected or combined with each other. Now it is time to combine them with the instructional content, presentation methods, and learning activities that are in the instructional strategy. In some cases, designers will find a great deal of overlap between instructional strategies and motivational strategies. For example, providing review opportunities could be considered as an instructional strategy as well as a confidence building strategy. The important thing is to be aware of both the motivational and the learning requirements of the tactics. A review opportunity might not be necessarily, strictly speaking, if the learners have demonstrated mastery, but if their confidence is low, then an additional review opportunity could be included primarily for motivational purposes.

Interface 7: Develop Instructional and Motivational Materials

At this point, it is time to decide whether to develop new instructional and motivational materials or adopt and modify existing ones. In either case, the development of motivational materials need not be separated from the development of instructional materials. As indicated in the previous section, the greater the extent to which the motivational strategies are transparent in that they are fully integrated into the instructional materials the better. Even if a particular motivational activity is not integrated into an instructional activity it should still have a clear relationship to the instructional objectives or it can cause problems. For example, let's

imagine that a newly assigned Coast Guard instructor is having trouble keeping his students engaged in a basic training class on the quick formation and rapid deployment of a helicopter-assisted rescue mission. The Coast Guard men and women on the rescue vessel have to repeat this course once a quarter, so they feel that they already know everything about the operation and the instructor is struggling to keep their interest. He talks to a visitor who is on the ship to conduct an inspection and discovers that the visitor recently participated in a dangerous rescue mission. He invites the visitor to talk to his class, which is a big success. The instructor would like to repeat this in his next class but knows that he won't always be so lucky as to have a guest speaker available. So, he searches the Internet to find videos of Coast Guard rescues. He succeeds in finding quite a few of them including a YouTube clip called the "Top Ten Coast Guard Rescue Videos" and the Discovery Channel series called *SOS: Coast Guard Rescue*. He includes a couple of them every time he teaches the class. At first they stimulate interest, but only while the video is showing. The students' interests do not transfer back to the training exercise. And, after awhile, the students even lose interest in the videos. In this example, the true stories are inserted into the lesson and they are related to the topic, but they are not tied directly to the learning tasks. The instructor would probably be more successful by building some scenarios and competitive games to engage the learners in proposing solutions to the scenarios that are presented as part of the learning task and then showing the videos of real-life situations dealing with that problem. In this way, the motivational elements would be fully integrated and perceived to be a natural activity because the students tend to like challenges and competition.

Interface 8: Evaluate and Revise

This interface illustrates that formative and summative evaluations are important for both processes and provide input to guide revisions to the instruction for both effectiveness and motivation. Evaluation for motivation can be planned and implemented in conjunction with evaluation for effectiveness including learner achievement. However, when implementing the plan, it is best to administer achievement tests before any motivational surveys are distributed. There are two reasons for this. The first is that you should avoid the possibility that the motivational survey would interfere with their performance on the achievement test and the second is that the achievement test is part of the overall instructional experience and might influence their motivational reactions.

Applying the Process

In summary, these eight major interfaces illustrate ways in which motivational design activities can be integrated with instructional design activities. However, as with all representations of a human-managed process, the actual implementation of it can vary depending on circumstances such as the

kinds of inputs that are already available, timelines, budgets, and other resources. It can also vary depending on the personal style of the designer and the nature of the subject matter. For example, in an orientation course on a new sales strategy, the course designer would probably not employ a detailed application of all of these steps. But let's assume that a designer is responsible for developing a course to teach highly critical skills pertaining to safety procedures in a nuclear power plant which could result in catastrophic damages if they are violated. If, as actually happens, the learners are overconfident in believing that they already know all of the procedures even if they don't and they are bored with the idea of having to take the course, then the instructor will probably benefit from following all of these steps in detail! It is easy to understand this point in the context of such a critical situation, but even in the simpler situation it is also important to include all of the critical success factors such as audience analysis, preliminary motivational strategy list, final strategy list, and integration with instruction. The difference is that some of these steps can be done quickly and informally in the simpler case.

Summary

It is the design process that is built into the ARCS model that makes it a practical, application-focused theory instead of being purely a descriptive or prescriptive theory. It combines a descriptive synthesis of concepts and theories of motivation into the four major categories of ARCS with a systematic approach to motivational design. This problem-solving, design approach makes the ARCS model unique and gives it its broad base of application.

However, it is important to realize that it requires a good base of knowledge to apply the process effectively. Farmer (1989) and Suzuki (Suzuki & Keller, 1996) found that if designers and teachers are not proficient in doing a motivational analysis of the audience, or if they just skip it and start creating motivational ideas, then the resulting products are likely to de-motivate rather than motivate the learners. This is because the resulting products will probably have too many motivational strategies as well as strategies that do not directly address the actual problems.

The next four chapters describe the primary motivational variables to consider when analyzing an audience and contain numerous examples of motivational strategies and tactics. Then, the three chapters after that provide detailed explanations with examples of how to conduct the motivational design process.