The Systematic Process of Motivational Design

by John M. Keller

Many people view motivation as a very "soft" area that is largely hit or miss. "Some people have the talent to motivate others, and some don't," they say. Not true.

It is true that motivation is a challenge, and from one point of view you can't really motivate anybody. You know the old saying, "You can lead a horse to water, but you can't make him drink." However, it is possible to create conditions that will stimulate people's desire to be interested and involved in their surroundings and to achieve their best. Many trainers, coaches, and other leaders do it regularly.

In this sense, motivation is not a magical or purely charismatic process of charming the audience. The factors that promote a positive response can be tried, adjusted, and readjusted until the desired effect is achieved. This is exactly the process used by entertainers whose goals are primarily motivational rather than instructional. Prior to their official premiere, they devote enormous effort to developing and rehearsing devices to get and sustain the audience's attention.

In education, we seldom have the commitment, patience, or resources to put this much effort and expense into developing the motivational aspects of courses, but the lesson to be learned is that it can be done. In fact, it is possible to improve the motivational appeal of courses without having to make an enormous investment in special effects or other entertainment strategies. "How," you might well be asking, "is this accomplished?"

To improve motivation rationally and predictably, there are two requirements. First, it is necessary to have an understanding of motivation; that is, to have an overview of the primary components of the motivation to learn, and of the kinds of strategies that will have a positive influence on these components. Second, it is necessary to know what types of strategies to use, how many to use, and how to design them into the course.

These requirements assume that although it is possible to understand and predict, at an abstract level, the factors that influence the motivation to learn, it is not possible to give concrete, generalizable prescriptions for what will motivate any given audience or individual. There is too much variability in the attitudes, values, and expectancies of learners. This leads to a second assumption: A problem-solving, heuristic approach to motivational design is more appropriate than prescriptive and algorithmic approaches. Given that the study of motivational design is an emerging area of inquiry, it is possible that increased knowledge will bring increases in precision, and a prescriptive approach may become feasible. But it does not appear that this will soon be the case.

One approach to achieving both of these ends, i.e. an understanding of motivation and a design model, is offered by the ARCS Model of motivational design (Keller, 1984). The ARCS Model describes how to understand the motivation to learn in terms of four major categories and several subcategories (Table 1). For each of these there are general questions to answer (Table 1), and specific types of strategies to apply. These aspects of the ARCS Model were presented in the first article in this two part series (Keller, 1987), and in other publications (e.g. Keller, 1983; Keller & Kopp, 1987; Keller & Suzuki, 1987).

The second major component of the ARCS Model, called "motivational design" answers the question of 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 judgement and benefits from experience, intuition, and creativity.

Motivational Design

To make instruction appealing is the goal of motivational design. The motivational design process, which is similar to the traditional instructional design process, has 12 activities, or steps, which can be divided into four major phases (Table 2). Despite its similarities, there are several differences with respect to the way in which instructional design models are usually represented.

Audience analysis is of particular importance in motivational design, and would be analogous to task analysis and instructional analysis in instructional design. It identifies where the motivational gaps are; that is, the specific areas in which you might have to give greater than normal emphasis to stimulate and maintain audience involvement. The output of audience analysis is the input information for formulating motivational objectives.

The entire design and development phases are somewhat different in that motivational design usually involves the enhancement of an already existing product. The instructional design specifications have already been determined, and the question for motivational design is how to make it interesting. Consequently, the motivational design phase generally begins with brainstorming, or another type of open-ended activity to generate a large number of possible solutions. Subsequently, these are scrutinized, and the most feasible strategies are chosen and integrated into the instructional materials.

In the motivational design model depicted in Table 2, implementation and evaluation are combined in the Pilot Phase, with the exception that developmental testing ("one-on-one" in Dick & Carey, 1985) is included as a development activity. This arrangement seems to represent the way in which these activities most often occur in practice.

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. The remainder of this article contains an overview (with a special emphasis on audience analysis) of how the motivational design model is used.

Table 1.
Motivational Categories of the ARCS Model

Categories & Subcategories	Process Questions
Attention	
A.1. Perceptual Arousal	• What can I do to capture their interest?
A.2. Inquiry Arousal	• How can I stimulate an attitude of inquiry?
A.3. Variability	• How can I maintain their attention?
Relevance	
R.1. Goal Orientation	• How can I best meet my learner's needs? (Do I know their needs?)
R.2. Motive Matching	• How and when can I provide my learners with appropriate choices, responsibilities, and influences?
R.3. Familiarity	• How can I tie the instruction to the learner's experiences?
Confidence	
C.1. Learning Requirements	• How can I assist in building a positive expectation for success?
C.2. Success Opportunities	• How will the learning experience support or enhance the students' beliefs in their competence?
C.3. Personal Control	• How will the learners clearly know their success is based on their efforts and abilities?
Satisfaction	
S.1. Natural Consequences	• How can I provide meaningful opportunities for learners to use their newly acquired knowledge/skill?
S.2. Positive Consequences	• What will provide reinforcement to the learner's successes?
S.3. Equity	• How can I assist the students in anchoring a positive feeling about their accomplishments?

Audience Analysis

A motivational profile based on the four categories of the ARCS Model, or (for more detail) on the nine subcategories, provides a means for identifying gaps in the audience's entry levels of motivation. One of the many challenges of motivation is that it is just as detrimental to learning and performance for students to be overmotivated as it is for them to be undermotivated. Undermotivation results in low levels of productivity while overmotivation usually results in high

error rates and poor efficiency due to stress or overconfidence. The objective in audience motivational analysis is to determine whether the audience will be below, at, or above the appropriate level in each motivational category.

The techniques used in conducting audience analysis can range from a "best guess" estimate based on the designer's or instructor's personal experience to a judgment based on the collection and analysis of formal data. Even a "best guess" method can be extremely beneficial because it requires you to break away from the broad, general concept of motivation, and predict the audience's attitudes in each of the categories of the ARCS Model (Table 2). 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. Interview questions similar to the process questions in Table 1 can be used, as can checklists (Note 1).

The results of the audience analysis can be portrayed on an inverted-U curve, as in Figure 1, which illustrates a frequent occurrence in training, especially in technical courses for new hires. The students will enter the course knowing that it is relevant, most of them will be reasonably confident that they can achieve the objectives although some will have concerns, and they will feel good about completing the course successfully. But, most will regard the subject matter, which is highly factual and procedural, as essentially boring to learn.

Table 2.
Motivational Design Activities and Process Questions

Phases & Activities		Process Questions
Define		
1.	Audience motivation analysis	• What are the audience's motivational attitudes toward the course to be offered?
2.	Motivational objectives	• What do I want to accomplish with respect to the motivational dynamics of the audience?
3.	Motivational criterion measures	• How will I determine whether I have accomplished my motivational objectives?
Design		
4.	Generate potential strategies	• How many possible strategies are there that might accomplish the motivational objectives?
5.	Select strategies	• Which strategies seem to be most acceptable for this audience, instructor, and setting?
6.	Integrate strategies	• How do I combine the instructional and motivational components into an integrated design?
Develop		
7.	Prepare motivational materials	• How do I locate or create motivational materials to achieve the objectives?
8.	Enhance existing instructional materials	• How do I rework the instructional material to improve its motivational appeal?
9.	Developmental test	• How can I get feedback as to whether these motivational strategies are likely to work?
Pilot		
10.	Implement with T-pop	• How do I prepare for and conduct a pilot test with representatives of the target population?
11.	Evaluate effects	• How can I detect the expected and unexpected motivational effects of the course?
12.	Certify or revise	• How do I determine whether the course should be revised or go "on-line"?

A slightly different profile resulted when the author conducted an analysis of the expected audience at a session of an NSPI annual meeting. Verbal descriptions were prepared (Table 3) and were represented schematically on the inverted-U curve (Figure 2). This was a "best guess" analysis based on the experience of the two presenters (Keller & Kopp, 1986) with NSPI and similar conferences. Feedback from the audience confirmed that the analysis was accurate. However, it is also true that the 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.

The audience analysis provides an indication of what types of motivational strategies to use, and where the greatest emphasis must be. In some categories, it may not be necessary or desirable to add any motivational strategies. 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 the audience. Instead, simply include a few comments to *confirm* the relevance of the material, and use work-related examples and exercises.

Figure 1.
Audience Analysis Results: Example 1

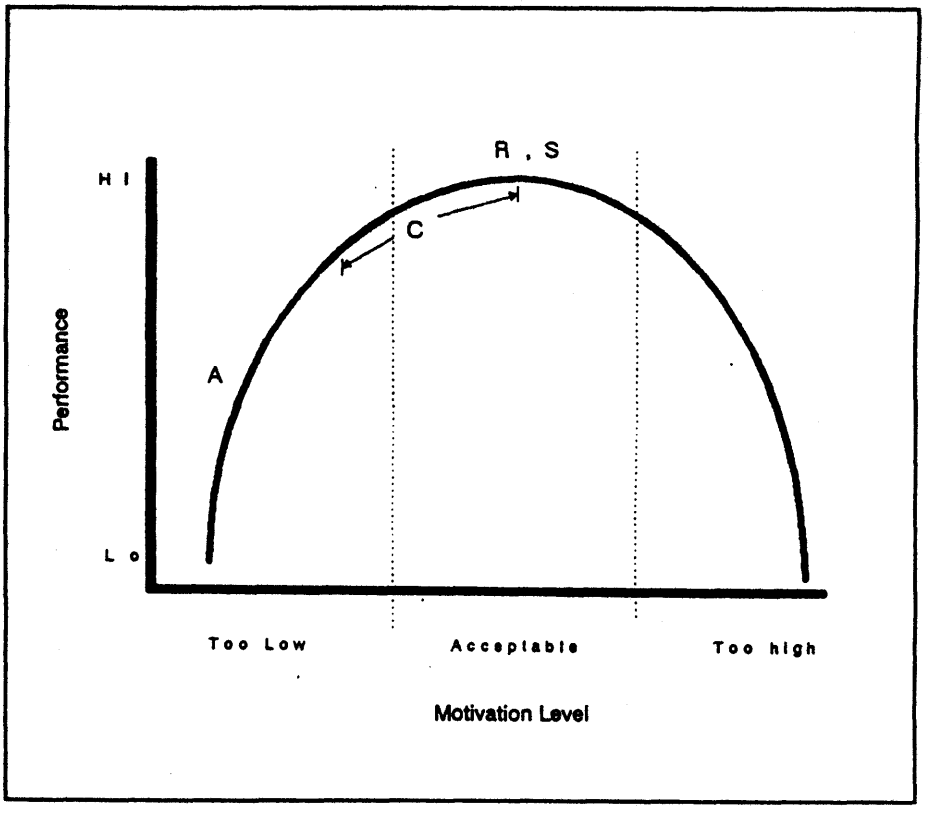

Table 3.
Sample Audience Analysis Results

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:	Variable. There will be a high degree of variance here. 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.

Motivational Objectives

After completing the audience analysis, it is time to establish motivational objectives. It is just as important to specify what you hope to achieve in the motivational realm as it is in the performance arena. This is accomplished by using the results of the audience analysis to build objectives.

With respect to the preceding example of an analysis of an anticipated NSPI audience, specific motivational objectives were written for confidence and relevance (Table 4), but not for attention

because it was not a critical area, even though strategies were included during the design process to ensure that attention would be sustained. Objectives for attention could have been written, and a novice might find it useful to write a greater number of objectives than an experienced designer/presenter, but there comes a point in writing motivational objectives, just as in writing instructional objectives, at which the level of detail can become trivial and unnecessarily costly. This is an individual matter.

Motivational Measures

After writing objectives and developing the performance criterion tests, it is time to prepare methods for assessing the motivational objectives (Table 2). The full range of measurement possibilities can be considered here, ranging from direct observation of specified behaviors to self-report questionnaires. Straightforward self-report measures (Table 4) can be very useful when they focus on an identified area of concern. The important point, as in any measurement situation, is that the measures are consistent with the objectives, and

Figure 2.
Audience Analysis Results: Example 2

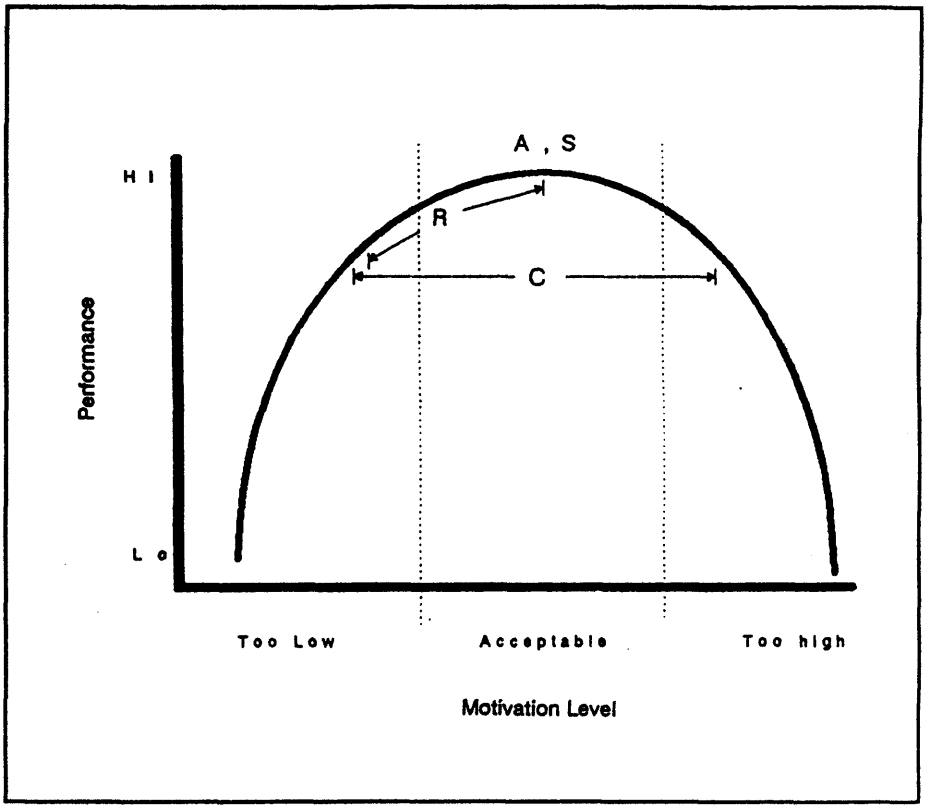

Table 4.
Motivational Objectives and Measures

Objective	Self-Report Measure
1. 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.)
2. 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

that the effects of bias can be taken into consideration in interpreting the results.

Motivational Strategy Design

Finally, after the instructional content and methods have been determined, it is time to work on motivational strategies (Table 2). This can be an enjoyable process, incorporating both creative and analytical thinking, if it is not rushed. There are three steps in this process: generation, selection, and integration.

The *generation* phase 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 similar to the traditional instructional design process and interfaces well with it (Table 5). The instructional design model depicted in Table 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 relationship between the two processes under discussion.

As illustrated (Table 5), the first step in motivational design is to do a motivational profile of the audience. Although individual designers will adapt any model 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 performance 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 obtain feedback about the accuracy, clarity, time requirements, and effectiveness of the materials. At the same time, feedback should be obtained about the appeal of the materials, and the feasibility of motivational activities.

During the pilot test, or small group try-out (Dick & Carey, 1985), 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 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, will often choose to complete all of the instructional design steps prior to or even including developmental testing, and then work on the problem of motivational enhance-

ments. 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.

Conclusion

The key factors in designing instruction to motivate people to learn are commitment and a systematic approach to incorporating motivational elements in support of the instructional elements. The preceding overview of the systematic approach illustrates that motivational design can be approached in a manner that is very similar to instructional design. However, it does require a knowledge base of motivational characteristics and methods, as described in the first article in this series (Keller, 1987). Even so, most experienced designers and instructors will find their own personal experiences to be a rich source of motivational ideas. After all, we have been consumers of instruction for more years of our lives than we care to remember. We have seen many examples, and nonexamples, of motivating instruction. This personal knowledge combined with some formal knowledge of motivation and a systematic process for motivational design can be powerful tools in improving the motivational appeal of instruction.

Notes

1. An extensive checklist to be used in the preparation of instructional materials, and a measurement instrument for obtaining student reactions are currently being tested by the author and several graduate students.

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Table 5.
The Interface of Motivational and Instructional Design

Phase	Instructional Design Steps	Motivational Design Steps
Define	Pre-project analysis—project	
	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	Select or create instructional materials	Prepare motivational materials
		Enhance instructional materials
	Developmental test for learning and performance	Developmental test for motivation
Pilot	Implement with T-pop representatives	
	Conduct formative evaluation	
	Certify or revise	

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