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Chapter 2 – What is Motivational Design?

Forethought

When you think about the concept of motivation which picture would you choose as part of a metaphor representing it, dry leaves or a rock (Figure 2.1)?

Figure 2.1. Leaves or a Rock?
Leaves created from Arts and Letters. Rock is from a personal photograph

Introduction

Many people would choose leaves because motivation, like a pile of leaves, can be unstable, frequently changing, elusive, and easily modified by external forces such as "the winds of change." The metaphor is apt because students can be highly interested and engaged at one moment and "on another planet" at the next moment.

On the other hand, you might have chosen the rock because motivation, like a sturdy rock, can be viewed as being determined, single minded, strong willed, and resistant to change. People can overcome great obstacles and accomplish stunning achievements due to intense and unwavering personal motivation, as did Helen Keller and Lance Armstrong. But, it can also have a negative side as when people are highly motivated by self-destructive goals and resist efforts to help them change.

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Thus, there can be contradictory views of what the inherent nature of motivation is. If it is more like leaves then it makes motivational design highly challenging. Even though you might be able to create a variety of motivational techniques, their effects might be short lived and it would be difficult to predict what motivational states would exist in the learners at any given time. On the other hand, if a person's motivation is already strong and stable then it would be easier to diagnose the person's motivational profile and prescribe strategies for change, but it might be more difficult to bring about the changes; you are not likely to motivate people to perform well in situations that are not consistent with their goals.

In fact, all of these sometimes seemingly contradictory attributes have to be taken into consideration in the motivational design process. Human motivation is complex and multidimensional, but a great deal has been learned about it and the knowledge can be incorporated into a systematic design process. The purpose of this chapter is to explain the concept of motivational design, describe a model for classifying approaches to motivational design, and discuss several related issues and challenges.

Characteristics of Design

What is design? This is a complicated concept but in a nutshell, as Koberg and Bagnall emblazoned on the back cover of early editions of their book (for example, Koberg & Bagnall, 1976), "design is a process of making dreams come true." This expression captures the sense of adventure and uncertainty that can accompany the design process, but more specifically it consists of a process of identifying a goal which is often based on a gap between the way things are and the way you would like for them to be, developing a strategy including activities and tools that you expect to help you accomplish the goal, exerting purposeful effort to achieve your goal, and finally evaluating and reflecting regarding your degree of success. Similarly, motivational design aims to enable the dream of educators, other behavioral change agents, and managers of human performance to stimulate and sustain people's efforts to make positive changes in their lives. More specifically, it refers to the process of arranging resources and procedures to bring about changes in people's motivation. Consequently, motivational design is concerned with connecting instruction to the goals of learners, providing stimulation and appropriate levels of challenge, and influencing how the learners will feel following successful goal accomplishment, or even following failure.

Motivational design can be applied to improving students' motivation to learn, employees' motivation to work, people's motivation to pursue a chosen career path, and improvements in their volitional, or self-regulatory, skills. It can also be used to bring about changes in specific motivational components of a person's personality such as increasing one's curiosity level, developing more positive self-efficacy, or overcoming feelings of

anxiety and helplessness. Motivational design is systematic and aims for replicable principles and processes. In that regard, motivational design is based on the scientific literature on human motivation and stands in contrast to the *charismatic* motivational speakers and workshops whose aims are largely in the area of emotional arousal and are grounded in personal experience, intuition, and adages. Certainly, the successes of motivational speakers or anyone else who attempts to influence the motivation of another can be explained or investigated, even if on a post hoc basis, in terms of motivational constructs. The difference is that motivational design seeks explanation and predictability while charismatic approaches tend to be grounded more in the unique talents of individuals who have achieved success.

In this book, the primary focus *of motivational design* is on people's motivation to learn and refers specifically to strategies, principles, processes, and tactics for stimulating and sustaining the goal-oriented behaviors of learners. When explaining various aspects of motivational design, it can be difficult to maintain a clear distinction between the concepts of strategies versus tactics. Strategies are general guidelines and overall approaches to achieving a goal, while tactics are specific activities that contribute to implementing the strategy. A strategy for maintaining reader interest could be to systematically and consistently employ Rudolf Flesch's principles for readability based on human interest factors (Flesch, 1948). Tactics would include the inclusion of gender specific words instead of neuter plurals (their, they, its), sentences with quoted dialog, and other such things. In this book, an effort has been made to maintain this distinction, especially in Chapters 8, 9, and 10 which cover the motivational design process, but there are times when it is awkward to maintain an exact distinction. In those situations, the word "strategies" is sometimes used more generically to refer to activities to bring about positive motivation.

Motivational design, as illustrated in Figure 2.2, does not occur in isolation from other influences on learning such as the instruction itself and the learning environment. Thus, even though motivational design is a distinct process in and of itself, it is used in conjunction with the systematic approach to instructional design and adds another dimension to it. Some instructional designers might believe that if instruction is well designed, it will, ipso facto, be motivating. However, it is easy to explain how instruction can be well designed but might not be motivating. The traditional view of *instructional design* is that it encompasses processes and techniques for producing efficient and effective instruction. Efficiency refers to economy in the use of learners' time, instructional time, materials, and other resources. It is not generally viewed as relating to the motivational aspects of instruction except in a negative way. If an instructional event makes inefficient use of time and resources it can be boring or irritating to the audience. But, efficiency of delivery does not add to students' intrinsic interest in the situation.

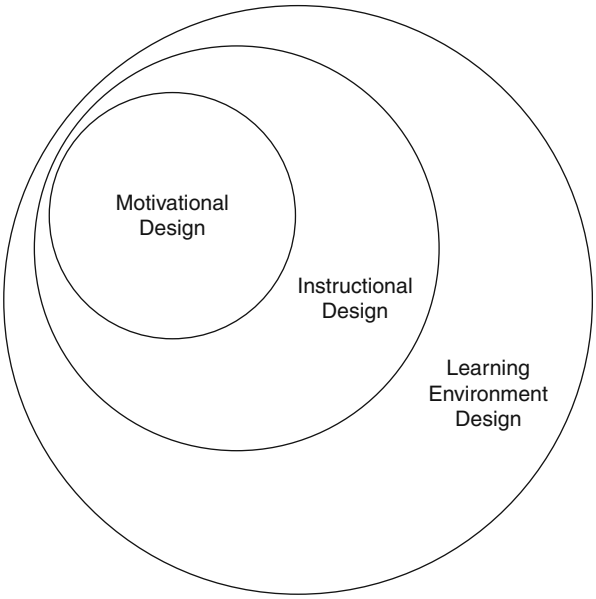

Figure 2.2. Motivational Design as a Subset of Instructional and Learning Environment Design.

Effectiveness, however, is sometimes regarded as including motivation. The argument is that instruction cannot be effective if it is not appealing to people. But in practice, instructional designers tend to have an unstated assumption that effectiveness refers to how well people can learn from an instructional event *given that they want to learn*. If the learning objectives are clear and appropriate, the instructional content is consistent with the objectives, and there are examples, practice, and tests that are all internally consistent, then the instruction will be effective if people are motivated to study, which adds an independent dimension to effectiveness. Thus, instructional design models often include two traditional motivational components consisting of getting the learners' attention as specified in Gagné's first event of instruction (Gagné, 1965; Gagné, Wager, Golas, & Keller, 2005) and providing reinforcement for correct responding (Skinner, 1954). However, none of these elements provides a sufficient explanation of motivation to learn.

The desire to succeed in a given instructional setting may not come from the instruction itself; it may come from long-range goals, institutional requirements, or many other sources (J. M. Keller, 1983b). Students might succeed, hence confirming the effectiveness of the instruction, because of purely extrinsic rewards such as a certificate, advancement to a higher grade or position, or avoidance of termination even if they do not have a desire to learn. Thus, instruction, like a trip to the dentist, can be very

effective without being at all appealing, but the experience will be avoided unless absolutely necessary. In contrast, motivational design strives to make instruction more intrinsically interesting.

At the other extreme, instructional materials can be very appealing without being effective, especially when their appeal comes purely from their entertainment value as illustrated in the following dialog:

Child: "Boy, that textbook had a lot of good cartoons in it."

Teacher: "Yes, it did. What were the authors telling us about global warming?"

Child: "Uh, uh, that it is getting hotter?"

To be effective, motivational tactics have to support instructional goals. Sometimes the motivational features can be fun or even entertaining, but unless they engage the learner in the instructional purpose and content, they will not promote learning. As a classroom management technique, the teacher can introduce fun activities as an extrinsic reward for achievement or effortful behavior as Malone (1981) did in his research on learning and motivation in computer-based instruction. These extrinsic rewards can contribute to the students' overall good feelings about the course and the teacher, but they will not in and of themselves promote learning. If used improperly and too frequently, these entertainments can actually have detrimental effects on students' motivation to learn because the students will begin to work only for the extrinsic rewards (Deci & Porac, 1978). Thus, motivational design is concerned with how to make instruction appealing without becoming purely entertaining.

An additional distinction of importance is the one between motivational design and behavior modification. Teachers and employers sometimes have to deal with people who have severe personal adjustment problems due to low academic ability, emotional immaturity, or anti-social behavior. Solutions to these problems generally fall into the categories of behavior modification or, when it is not possible to change the person's behavior, expulsion from the situation. Assistance with these problems comes from areas such as counseling, psychological education, psychotherapy, and personnel specialists. This is outside the boundaries of motivational design as covered in this book, even though motivational design draws upon many of the same underlying concepts and theories of motivation. Yet, motivational design can lead to improved behavior by creating improved motivational states and traits for some students, especially when the motivational designer is focusing on the development of skills in self-motivation and self-regulation in students; however, motivational design is concerned **primarily** with improving the appeal of instruction or a work environment for people who fall within reasonable boundaries of readiness to learn or to work. More challenging situations can be approached using the same methods that are presented here, but their application would require expertise in human behavior modification that goes beyond the contents of this book.

From a broader perspective, learning environment design requires one to consider both motivational and instructional influences on learners, and both of these activities require consideration of learner goals and capabilities together with cultural and environmental factors that affect attitudes and performance. It is no wonder that the design of effective, efficient, and appealing learning environments is a complex enterprise. Even though there is a growing technology, in the sense of systematic knowledge of how to create learning environments, there is also an art to being able to successfully design and teach. The art of design and teaching is based on both knowledge and experience and refers to the necessity for personal judgment and problem solving. Many of the challenges faced by teachers and designers cannot be solved *by the book*. They can be solved by a combination of systematic problem solving and personal judgment based on one's overall experience and professional expertise. However, by learning and applying systematic problem-solving processes, and by learning how to recognize and classify various types of problems, one can increase one's expertise and judgmental capacity. The process described in this book will not lead you to automatic answers to motivational problems, but it can help you systematically and predictably improve the motivational qualities of your instruction and overall learning environment.

Motivational Design Models

Motivational design models can be categorized into four groups (Keller, 1988, 1994). The first three are grounded in psychological theories of human behavior. They can be classified as person-centered theories, environmentally centered theories, and interaction theories. Models in the fourth group, called omnibus models, have more pragmatic or pedagogical origins and incorporate both motivational design and instructional design strategies without distinguishing between the two. These omnibus models tend to grow out of successful practices that have been validated as to their effectiveness but are not based on any particular theoretical framework and can be based on a specific technique or theme.

Person-Centered Models

Person-centered models are grounded primarily in psychological constructs or theories that represent one or more motivational dimensions of personality. Their aim is to make positive changes in these characteristics which result in better psychological adjustment and improved learning. This approach can also be called psychological education which had a period of rapid growth and development in the 1960s and 1970s. Flanagan (1967) reported that a study by the American Institutes for research of 440,000 high school students concluded that high schools fail to help students develop a sense of personal responsibility for their own actions including their personal, educational, and social development. Evidence such as this contributed to the development of psychological education to supplement

the teaching of vocational and academic skills to enable students to be better prepared for their futures. According to Alschuler (1973), there are four common goals that can be observed in the procedures employed within a psychological education course, keeping in mind that the word *course* refers here to a unit of instruction that can be anything from a stand-alone workshop to a component of a regular course in mathematics, language, or any other topic.

1. The first goal refers to procedures that are included to stimulate curiosity and fantasy. In this context, fantasy refers to such things as visioning oneself doing something differently or accomplishing a goal.
2. The second goal is illustrated by activities in which the participants experience a new way of thinking or behaving instead of just learning it cognitively. Games, role playing, and simulations are employed in this regard.
3. The third goal focuses on emotional development. Students engage in experiences that stimulate emotional responses and learn how to examine and manage their emotions, which is a desirable part of reaching maturity and developing self-determination (Goleman, 1995).
4. The fourth goal includes procedures that help students learn to live fully and intensely in the here and now. The psycho-therapeutic literature is replete with examples of how much time people spend regretting past actions and fearing future events which Kabat-Zinn (1990) calls a state of "full catastrophe living." However, as he points out, past events cannot be changed and most of the feared events never materialize, so it is much healthier to come to terms with the past, plan for the future as much as feasible, and focus on the present. This leaves one much freer to be emotionally integrated and open to learning. This concept of *mindfulness living* was expressed beautifully by an 85-year-old woman (Kabat-Zinn, 1990): "Oh, I've had my moments, and if I had to do it over again, I'd have more of them. In fact, I'd try to have nothing else. Just moments, one after another, instead of living so many years ahead of each day" (p. 17).

An example of a person-centered model is the motive internalization process created by McClelland in working with adults to improve their achievement motivation (McClelland, 1965) and applied in a school setting by Alschuler (Alschuler, Tabor, & McIntyre, 1971). The achievement motive is characterized by having a desire to achieve challenging goals and often includes a sense of competition. People who are entrepreneurs or who work in competitive environments such as sales normally have high levels of the achievement motive. It can also be demonstrated by wanting to outperform someone else or achieve self-imposed standards of excellence as when a marathon runner finishes the race with a new personal best time. In this case, the competition is with one's own standards instead of competing with

other people. Other indicators of the motive to achieve are a desire to perform well over a long period of time in a process of reaching an achievement goal or doing something unique as with inventors and researchers.

Based on McClelland's (1965) extensive work on developing achievement motivation in adults, Alschuler (Alschuler, 1973; Alschuler, Tabor, & McIntyre, 1971) created a model for the development of achievement motivation in adolescents. His approach contains a six step process for arousing and internalizing a motive:

1. Attend. Get and sustain students' attention by using moderately novel changes in approaches
2. Experience. Allow students to vividly experience the thoughts, feelings, and actions associated with the motive.
3. Conceptualize. Help students learn how to conceptualize the motive by naming the parts and describing it.
4. Relate. Help the students conceptualize how the motive is related to their images of themselves, their basic motives, and the demands of their lives.
5. Apply. Provide opportunities and guidance for the students to practice applying the motive and experiencing the thoughts and feelings associated with it.
6. Internalize. Promote internalization by gradually withdrawing support while continuing to provide opportunities for students to exercise the motive with more voluntary and personal responsibility.

Typically this process is taught in a workshop setting and is supported by a variety of self-report measures, reflective activities, and games that help participants experience behaviors associated with the motive. A typical game used to illustrate the achievement motive is the ring toss game in which participants are given an objective, choose their own goals and challenge level, play the game, and then reflectively interpret the results. The game has numerous variations but in its basic form the participant is told that the objective is to throw as many rings onto a free standing pole as possible. The participant is given four or six rings and is given a free choice as to how close or far away to stand. Logically, one would expect the participants to stand above the pole and drop the rings on it in order to maximize the probability of success, and some participants do this. But many of the participants choose a position a few feet away from the post and then adjust their position closer or further away depending on whether or not they succeed on individual throws. This illustrates the achievement motive in which people like to set a moderate challenge for themselves. There are variations on this and other games that are used to illustrate how the addition of incentives and competition affect participant's goal orientations and decisions.

The relationship between achievement motivation and performance is not always clear, especially in school classrooms where

achievement in the form of compliance to externally imposed standards is frequently the primary requirement for success. In this setting, desire for success takes the place of the achievement motive which is activated when people have an opportunity to exercise a degree of autonomy in setting goals, defining their standards of excellence, and having control over resources required to achieve their goals. The situation is also complicated when, as often happens, one is trying to work on more than one task at a time. As motivation increases, there is a tendency for there to be a decrease in secondary task performance and an increase in primary task performance (Humphreys & Revelle, 1984).

Another area of psychological education that is directly related to the development of student attitudes and habits that can result in improved performance is volition, or as it is also called, self-regulation and these terms are used interchangeably in this book. This is not a psychological construct in the formal sense, but rather a concept that refers to a collection of behaviors and attitudes that are related to persistent effort to accomplish a goal. It is one thing to have an intrinsically motivated goal or an extrinsically imposed requirement that is instrumental to achieving important personal goals, but it is something else to employ behaviors that help one resist distractions and discouragement and to maintain persistent efforts to achieve the goal. This "something else" is summed up in the concept of volition and is illustrated in slightly varying ways by different theorists. One well-known model is that of Kuhl (1984, 1987) who lists six strategies, which he calls "action control strategies," that can be used to maintain task orientation. They are

1. Selective attention, also called the "protective function of volition" (Kuhl, 1984, p. 125): it shields the current intention by inhibiting the processing of information about competing action tendencies.
2. Encoding control: facilitates the protective function of volition by selectively encoding those features of incoming stimulus that are related to the current intention and ignoring irrelevant features.
3. Emotion control: managing emotional states to allow those that support the current intention and suppress those, such as sadness or attraction, in regard to a competing intention that might undermine it.
4. Motivation control: maintaining and reestablishing saliency of the current intention, especially when the strength of the original tendency was not strong ("I must do this even though I don't really want to.")
5. Environment control: creating an environment that is free of uncontrollable distractions and making social commitments, such as telling people what you plan to do, that help you protect the current intention.
6. Parsimonious information processing: knowing when to stop, making judgments about how much information is enough and to make decisions that maintain active behaviors to support the current intentions.

Kuhl's action control theory has been proven to provide valid strategies for establishing and maintaining self-regulated behavior (Kuhl, 1987), but the majority of research on this approach have been experimental, laboratory-type studies and in changing maladaptive behaviors. Of more immediate relevance in learning environments, especially with children, is the work of Corno (1989) and Zimmerman (1989).

For example, Corno and Randi (1999) proposed a design theory for self-regulated learning in a classroom setting. Their approach was to build self-regulatory skills implicitly by designing a unit of instruction in such a way as to expose students to these strategies as an integrated element of the course design, and also by means of the assignments they were given. For example, the study was conducted in a literature class with a thematic assignment dealing with quests. Specifically, the students analyzed the behaviors of Odysseus, from Homer's *Odyssey*, that led to the successful completion of his quest. The list produced by the students matched well with Corno and Randi's five indicators of self-regulatory behavior (Table 2.1), which were similar in some respects to Kuhl's action control strategies and to other characterizations of self-regulation strategies (Boekaerts, 2001).

Table 2.1. Self-Regulatory Strategies and Examples.

Self-Regulation Strategies	• Examples of parallel Strategies from Quest Analysis
Metacognitive control	• Planning • Monitoring/setting benchmarks • Evaluating progress
Motivation control	• Focusing/positive thinking • Endurance/self-reliance
Emotion control	• Visualization/mental imagery
Control the task situation	• Resource use/sorcery • Use of own cleverness/trickery
Control others in the task setting	• Getting help from confidants • Controlling his men

In an effort to help students build transfer from this activity to their own lives, Corno and Randi did a follow-up activity in which students wrote essays describing quests that they had undertaken. They then analyzed the essays for evidence of self-regulatory strategies and the researchers found that nine of ten students included at least eight examples of self-regulatory strategies in their essays. Even though they obtained positive results from this innovative teaching approach, the study was limited by the fact that there was no confirmation that students used these strategies in a newly

experienced challenging situation. However, this design model was interesting in that it began with a somewhat discovery learning approach and then shifted to a more explicit examination of the characteristics of self-directed learners.

The approach taken by Corno and Randi was different from Alschuler, but these two examples of person-centered models had a similar goal which was to assist students in the development of motivational and volitional attitudes and habits that would improve their self-reliance and performance.

Environmentally Centered Models

Environmentally centered models are grounded in the principles of behavioral psychology which assume that behavior can be adequately explained in terms of an organism's responses to environmental influences. From this perspective, the concept of motivation is defined by Sloane and Jackson (1974) "as the extent to which certain stimulus objects or events effect the occurrence or nonoccurrence" (p. 5) of a given behavior. No reference is made to internal states of cognition or emotion. The primary ways to influence motivation are through the manipulation of deprivation and satiation. It is a well-established principle that people are more likely to repeat a behavior that has pleasant, desirable consequences than one that has unpleasant or no consequences and, furthermore, pleasant consequences are usually associated with receiving something of which you have less than you desire or which you desire more than what you are currently receiving (Premack, 1962). Satiation consists of receiving something which you no longer wish to have. Thus, if a teacher withholds positive, personal recognition from a student unless the student has exhibited a desirable behavior, then the student is more likely to exhibit those behaviors than ones which are ignored or result in undesirable consequences. However, if a student has resorted to using undesirable behaviors as a way of getting attention, then the teacher can use satiation by giving lavish attention to the student to reinforce desirable behaviors and ignore the undesirable ones. These examples, even though they are oversimplifications of real settings, illustrate the basic principles.

There are numerous behavior modification models (Gardner et al., 1994; Medsker & Holdsworth, 2001) that incorporate the principles of contingency management and most of them include five steps. The first is to identify the behavior that you wish to change, the second is to establish its baseline level by measuring its frequency of occurrence before you introduce any interventions, the third is to plan the contingencies of reinforcement which refers to the pattern of administering consequences based on the occurrence or nonoccurrence of the desired behavior, the fourth is to implement the program, and the fifth is to evaluate results to determine if there has been an acceptable level of change in the frequency of

performance compared to the baseline. However, these principles were applied to behavior change in general, not specifically to instruction and learning.

It was the work of people such as Pressey (1926) and Skinner (1954, 1968) that led to the systematic application of these principles to motivation and instruction in a learning environment. Skinner who is probably the best known, applied these concepts to education (Skinner, 1968) in a form that can be called motivational design even though his model does not specifically differentiate the learning theory component of his approach from the motivational components. The primary result of his work became known as programmed instruction which is a combination instructional design and motivational design model. It uses the motivational principle of immediate positive reinforcement following correct responses, and it requires that instruction be structured to insure correct responses to the fullest extent possible. This early work led to the development of many principles of instructional design (Markle, 1969), but there were persistent problems with descriptions of the role of positive reinforcement which took the form of providing knowledge of results. This reinforced learning and was also considered to have a motivationally rewarding effect. However, research did not strongly support the combined influence of reinforcement and feedback on learning and motivation. Tosti (1978) helped clarify the issue by distinguishing between motivational and corrective feedback and the optimal timing for each.

With respect to motivational design models based on reinforcement principles that focus primarily on motivation to learn, one of the best known is the Personalized System of Instruction (PSI) developed by Fred Keller (1968). It incorporates programmed instruction, other instructional activities, and a complete instructional management system. It is self-paced and allows students to take tests when they are ready and to retake them if they do not succeed the first time. His system was initially appealing to faculty and students, but with experience problems emerged even though it was proved to be a highly effective form of instructional design (J. Kulik, Kulik, & Cohen, 1979). Regarding problems, faculty found that the time required to develop high-quality instruction and to manage the implementation of the class was far greater than they expected (Gallup, 1974). Many students took advantage of the self-paced aspect of the class to complete their work in a timely manner but many others procrastinated and their performance suffered (Gallup, 1974). Thus, extrinsic reinforcements that were available as an instrumental motivation to perform were not sufficient to stimulate the behavior of many students. The professors had to implement deadlines and other controls to influence the regulation of the procrastination-prone students.

In a different approach, Sloane and Jackson (1974) provided a model which describes how basic concepts of conditioning and reinforcement can be used to control the motivation of students. The model also attempts to

describe how to move students from an external reinforcement system to an intrinsically rewarding condition. This can be a challenging goal because of the potentially negative influences of extrinsic control on intrinsic motivation (Lepper & Greene, 1978), but has promise for succeeding when there is initially no intrinsic motivation on the part of the learner. The work of Deci and Ryan (1985), as described in Chapter 1 and elsewhere in this book, provides a more comprehensive explanation of a design process associated with their self-determination theory that promotes different levels of internalized extrinsic motivation in addition to promoting intrinsic motivation.

Interaction-Centered Models

These models assume that neither the personal nor the environmental assumptions provide an adequate basis for understanding or explaining human motivation. In this approach, sometimes called social learning theory, or expectancy-value theory (J. M. Keller, 1983b), human values and innate abilities are seen to both influence and be influenced by environmental circumstances. Currently, *interaction-centered models* are probably the most widely used in the study of human learning and motivation in an educational context (Eccles & Wigfield, 2002; Pintrich & Schunk, 2002). In this regard, Hunt and Sullivan (1974) have offered theories and reviews of motivational research that focus on the interactions of individual traits with environmental influences on behavior, including social factors such as teaching style and the manner of using praise (Brophy, 1981).

Working within the general context of expectancy — value theory, deCharms (1968) developed an applied model with two major variables: achievement motivation representing the value component and personal causation representing the expectancy component. DeCharms' model is patterned after the work of McClelland and Alschuler (Alschuler, 1973; McClelland, 1965), but by including the concept of personal causation, it becomes an interactive model. It is concerned primarily with changing individual behavior to help students feel more confident and more in control of their destinies, and it includes many motivational strategies that can be used in a general instructional design process.

Wlodkowski (1984) provides a comprehensive, applied approach to motivation. He includes a large number of motivational factors including both humanistic and behavioral principles and he divides motivational strategies into six categories: attitudes, needs, stimulation, affect, competence, and reinforcement. He puts these into a process model which specifies things to do at the beginning, during, and at the end of a lesson or module of instruction. This model is based on a logical organization of components and does not have an integrative theoretical foundation. His presentation of his model includes numerous specific descriptions of motivational strategies, for the middle and secondary school levels as well as adult education level (Wlodkowski, 1999).

The model that provides the foundation for this book (J. M. Keller, 1983b) is an interactive motivational design model that is grounded in expectancy-value theory, reinforcement theory, and cognitive evaluation theory (Figure 1.2). These theories are integrated by means of a systems portrayal of when and how each of them is related to effort, performance, and satisfaction. This model contains four categories of motivational variables: attention, relevance, confidence, and satisfaction (ARCS) (J. M. Keller, 1987b). These were derived from a comprehensive review and synthesis of motivational concepts and research studies. A distinctive characteristic of the ARCS model, in addition to its four-category synthesis of motivational concepts, is its systematic design process that uses learner motivational analysis as a basis for determining what kinds of motivational strategies to use (J. M. Keller, 1987c, 1999). This is in contrast to approaches that prescribe specific categories of strategies to use at specified points in an instructional sequence.

Omnibus Models

Omnibus models are best described as complete solutions to given instructional goals. They are not motivational design models, but are included here because they offer excellent examples of motivational strategies in situ. The models sometimes have a theoretical underpinning, but their primary basis is pragmatic in that they incorporate a complete system of teaching and instructional management that is designed to accomplish a specific type of instructional purpose. Motivational strategies are embedded in the totality of these models, but are not usually highlighted or labeled as such. Instead, they are listed as subheadings under the functional category they serve. These might include such things as *getting attention*, *clarifying values*, *monitoring progress*, or *rewarding achievement*.

Joyce and Weil (Joyce & Weil, 1972; Weil & Joyce, 1978) and others (Medsker & Holdsworth, 2001) provide compilations of these models. They use a consistent format to present different teaching models that are grouped under one of four categories depending on whether the primary purpose of the model is social interaction, information processing, personal growth, or behavior modification. Examples of these models are *Social inquiry: An inquiry model for the social sciences*, *Inquiry training model: Theory-building as a source* (for teaching scientific inquiry and theory-building for children), and *Synectics: A model to build creativity*.

This category also includes many of the constructivist approaches to learning environment design (Duffy, Lowyck, & Jonassen, 1993) which focus on how to help learners develop meaningful, contextualized bodies of knowledge. Their concerns include the development of authentic learning experiences in which the lower levels of learning, such as declarative knowledge, are integrated into personally and socially meaningful structures of conceptual understandings, problem-solving skills, and complex cognitive skills (Van Merriënboer, Kirschner, & Kester, 2003).

Process Versus Models: Benefits of a Holistic, Systems Approach

Most of the preceding motivational design models are either procedural guidelines associated with a specific motivational concept or theory or structural models illustrating the relationships among variables and outcomes. In other words, they represent specific approaches to solving motivational problems or, conversely, achieving motivational goals in specific situations. However, motivational design, with emphasis on the word *design*, can also be viewed as referring to a generalizable process incorporating systems analysis and systematic problem solving. From a systems perspective, motivational characteristics and states are influenced by many overlapping and interacting sub systems and supra systems in an environment. For that matter, a person's motivation is itself multidimensional. For example, kids' motivations in a given class may include motivation to learn, to exert influence over other people, to be liked by other people, to avoid notice, and so forth. These motivations are influenced by their family and culture; role models such as their peers; their teachers; the physical environment including such things as temperature and noise; and characteristics of the instructional environment including stimulus richness, clarity of instructional goals and content, and challenge level to mention a few. All of these elements of a learning environment and its context can, in principle, be mapped into a systems model and studied with respect to their influences on motivation and performance. And, the results of theory and research on the relationships among these various components can also, in principle, be fitted into a systems perspective (see J. M. Keller, 2008b for an example).

Design Challenges With Regard to Motivation

There are many problems related to developing a formal approach to the study and practice of motivational design, but two are of particular interest. The first concerns the multidimensional nature of motivation, many aspects of which are rather unstable. Like ability which is a fairly stable and predictable human characteristic, motivation also has some reasonably stable characteristics. For example, people tend to have fairly stable orientations and motive profiles. That is, a person with a high need for achievement will tend to prefer predictably different kinds of activities from a person high in need for affiliation and low in need for achievement. Yet, both of these motives can be overridden by a motive, such as the need for physical security if it assumes a higher priority in a given situation. And, other aspects of motivation are highly volatile. For example, a person who is paying full attention to a lecture one moment can be easily distracted by an unexpected noise or interference from a nearby person. Furthermore, the intensity of one's motivation can vary tremendously over short periods of time. This variation in intensity, or arousal, tends to have a curvilinear

relationship to performance. Low levels of arousal tend to result in low levels of performance due to lack of interest, boredom, and low levels of effort. As one's motivation, or arousal, increases the quality and quantity of one's performance increases, but only to an optimal level (Figure 2.3). Beyond that, performance begins to deteriorate as motivation continues to increase. This is comparable to moving from a state of boredom through a state of optimal arousal to a state of debilitating anxiety. Performance is less than optimal at either end of the curve. The articulation of this relationship is generally attributed to Yerkes and Dodson (1908) and is called the inverted U-curve, or Yerkes–Dodson Law. The multiplicity of concepts that are subsumed under the concept of motivation, the variability of many of these constructs, and their curvilinear relationship to performance present real challenges to anyone who tries to develop models of motivational design!

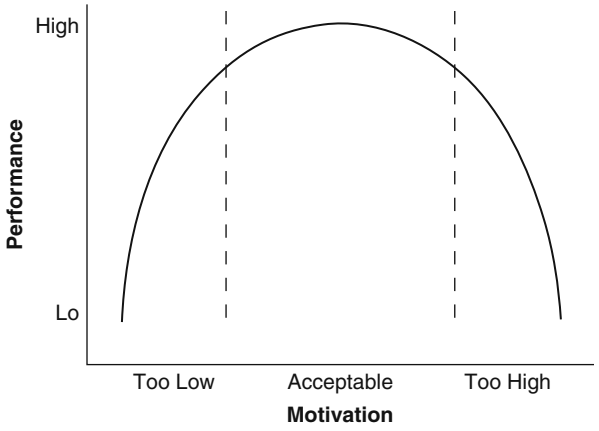

Figure 2.3. Curvilinear Relationship Between Arousal/Motivation and Performance.

The second problem, which is that of measurement, is closely related to the preceding. Just as it is difficult to obtain a functional holistic theory of motivation, it is difficult to **measure** the important elements of influences of motivational design because there are four, and probably more, sets of variables that have to be considered. First are the human characteristics that pertain to motivation, second are the design strategies intended to influence motivation, third are the social and environmental conditions that might influence the effectiveness of the motivational strategies, and fourth are consequences, which present special problems. Sometimes changes in achievement are used as the primary or only dependent measure in studies of motivational effects. It is better to use measures of effort, such as time-on-task, intensity of effort, or latency of response, because these are direct measures of motivation. Achievement is an indirect measure that is

influenced by many non-motivational factors such as ability, prior knowledge, and instructional design factors. Measurement issues and examples of useful surveys are included in Chapter 11 and measures of specific constructs are described in context in Chapters 4, 5, 6, and 7.

Isolating and Defining the Motivational Problems

Too often, problems are presented without elaboration as "motivational" problems. However, motivation has many components, and a key component of motivational design is to identify the specific and concrete elements of motivation that are problematic in a given situation. A key part of the motivational design process presented in this book is the analysis phase (see Chapter 8). During the analysis phase the motivational constructs presented in Chapters 4, 5, 6, and 7 are used as a basis for diagnosing the motivational profiles of learners to identify specific ways in which their motivation might be satisfactory in a given situation and ways in which there are deficits. The deficits then become the targets for applying strategies to improve those motivational problems. Also, the inverted U-curve provides a basis for doing this analysis because it provides guidance for specifying when students are under motivated or over motivated. Thus, rather than focusing on the global concept of motivation and trying to modify it, the motivational designer can be far more effective by isolating specific aspects of learner motivation where there are problems and then designing relevant strategies.

Deciding Whether to Change the Person or the Environment

Improvements in learner motivation can result from changing the attitudes and habits of people or by changing environmental conditions to accommodate people's existing characteristics. Correspondingly, some psychological schools of thought and educational philosophies focus more on the individual, as in humanistic frames of reference, while others focus more on environmental materials and conditions to promote learning, as in instructivist theories and behaviorist orientations. As previously described, this book adopts an interactionist approach which assumes that learner motivation, and other human behaviors are influenced by internal psychological and physiological conditions and also by environmental stimulation and conditions. People's special abilities, motives, educational and life goals, and energy levels will influence their motivation in given situations. Environmental influences such as availability of resources, clear instructions, equitable grading practices, and variation in instructional methods will also influence learner motivation.

A goal of the motivational design process is to move systematically from analyses of learners and environmental components toward the development of strategies that will either accommodate the learners' existing

characteristics or bring about desirable changes depending on what is most appropriate in the situation. In other words, it would be both futile and dysfunctional to try to change people so that everyone had the same learning style. This means that learning environments should be designed to accommodate differences in learning styles. On the other hand, if people lack certain characteristics that could be improved with greater benefits to them, as in the development of self-regulatory skills in people with poor learning habits, then it would be desirable to change those individuals. However, in still another variation on this relationship, if a group of learners are incapable of developing effective self-regulatory skills due to emotional, neurological, or some other type of handicap, then it would be appropriate to try to design the environment to compensate for this problem by having more frequent deadlines, closer supervision, or "motivational messages" (J. Visser & Keller, 1990). These types of interactions between learner aptitudes and instructional methods were studied extensively by Cronbach and Show who published a comprehensive review of this literature (1976). They found little support for providing variations in most instructional approaches to accommodate people based on differences in learning styles, such as those who are more visually versus verbally oriented, because it is much easier to design heterogeneous approaches that accommodate multiple learning styles. For example, it is much easier to design instruction that contains both visual and verbal representations, which is what most teachers do, than to divide the students for specialized approaches. But, Cronbach and Snow (1976) did conclude that there was potential for developing alternative approaches to accommodate differences in learner motivation.

The Limitations of Motivational Design

Even though a systematic motivational design process can be highly effective, there are challenges and limitations to consider when attempting to implement it. One set of challenges concerns the attitudes of teachers and designers toward being responsible for learner motivation. This issue is important because many teachers believe their responsibility is to teach content and skills effectively, but it is the student's responsibility to decide whether or not to learn them. Teachers say they cannot control student motivation; that is, they cannot force students to learn if the students do not want to. This is true, but it is an oversimplification. Teachers cannot control student motivation but they certainly do influence it. They can stimulate students' desire to learn or they can kill learner motivation. There are countless stories of students who became interested in a subject because of the enthusiasm and commitment of the teacher or because of the personal attention given to the student by the teacher. Conversely, too many students have had serious difficulties with their confidence and motivation to learn because of teachers who were harsh, boring, or just not interested in their subject matter or the students.

For teachers and trainers to accept the challenge of motivating learners it is important to understand what their boundaries of responsibility are. Because there are many dimensions to motivation, there is a corresponding diversity of motivational problems. Motivation enters into every aspect of people's lives; it affects their desire to be alone or with other people, their interest in building relationships, their choices of jobs, their willingness to accept authority, their desire to learn, their self-perceptions and self-esteem, their personal management, and even their desire to live. As a teacher, even though you cannot affect students' motivations in all of these areas you can and will affect some of them.

The teacher's motivational responsibility: Within this broad frame of reference, there are three areas that teachers commonly encounter. These are the motivational characteristics that relate to students' willingness to cooperate, desire to learn, and self-perceptions. The first category, *classroom behavior*, is important because a teacher has to manage the students' behaviors in the classroom to create a positive environment for learning. The second area, called *motivation to learn*, is important because this is central to teaching and learning. The third area, *self-perceptions* is more problematic. Teachers can support the development of positive self-perceptions, but normally they cannot assist students with personal motivational problems. This is usually the responsibility of counselors in the school and other adults in the students' lives, such as parents, friends, or professional therapists. With regard to all of these areas of motivational concern, this book focuses primarily on the **motivation to learn**, both the internal characteristics of the learners that affect their desire to learn and the motivational tactics that may be used by teachers to create positive learning environments.

Summary

There are many approaches to bringing about changes in peoples' motivation. They range from clinical efforts to make changes in peoples' personalities, as in the work of McClelland, Alschuler, and deCharms (Alschuler, 1973; deCharms, 1976; McClelland, 1965) to change the basic motive structures of people, to design models such as those of Wlodkowski and Keller (J. M. Keller, 2008a; Wlodkowski, 1999) that focus primarily on creating learning environments that will stimulate and sustain people's desire to learn. These models can be categorized according to whether they are more person centered, environmentally centered, based upon interactions between the person and the environment, or more comprehensive as in the omnibus models that integrate motivational and instructional strategies in support of a particular type of goal-oriented learning environment. Furthermore, all of these approaches are feasible and have evidence in support of their validity. Each of them has a specific purpose and has proven to be valid when used appropriately.

The success of any approach depends in part on how well it is integrated into the overall learning environment. Adopting a systems perspective helps one identify all of the subsystems within a larger system that must be considered in order for an innovation to be successfully adopted and sustained over time. For example, if you implement a program of achievement motivation training that successfully increases the need for achievement among the students in a classroom or school, those motive changes will probably diminish or even extinguish if the dominant family or social culture does not support individual goal striving and competition. In the early 1990 s, the government of Indonesia instituted their *Open University* to make higher education available to the large numbers of people who either could not afford to go to a residential institution or could not qualify for the relatively small number of openings in those institutions. One of the assumptions of an open university system is that students will be able to enroll, receive their materials, and study individually at their own paces. However, there were major problems during the early implementation of this system. In the social culture of Indonesia, students were accustomed to working together in cooperative groups in almost everything they did which was a reflection of the larger cultural mores. Now, suddenly they were expected to work in a totally individualistic environment in which they had to set their own goals and work schedules and work diligently to achieve their goals. Thus, the students did not exemplify a traditional need for achievement profile and numerous changes had to be made in this open university system in order for it to succeed.

This example also illustrates the importance of audience analysis in a motivational design process. There are many types of challenges to face when trying to systematically influence learner motivation, including the inherent characteristics of human motivation, but the process is made even more difficult in the absence of a thorough understanding of the motivational dynamics of your students. Students, like people in other parts of life, are busy and want to work in the most direct way possible to achieve their goals. This is especially true in settings like schools where most of the motivation tends to be extrinsically determined. Thus, students will resist if not actually resent frivolous activities designed to motivate them if those activities have no relationship to the learning goals. This is especially true in adult learning environments. For example, if your audience consists of a group of professionals who are attending a short course for the purpose of learning an important new job-related skill or process, they will become annoyed if you engage them in lengthy warm-up or icebreaking activities unless they perceive these activities to be in important part of developing the appropriate social dynamics in that learning environment. However, this is seldom the case and most of the time a getting-acquainted activity that is integrated as a functional part of the lesson's learning objectives is far more effective. This can take the form, for example, of having people recall and discuss experiences or challenges related to the tasks included in the workshop or course agenda. Not only are the participants getting acquainted

during this activity, but the results of the activity can be used by the facilitator to help articulate the specific objectives and contents of the training event.

In conclusion, even though human motivation is complex and there exists a huge number of concepts and design strategies related to human motivation, it is possible to obtain an overview of this content in such a way that one can follow a systematic process of motivational design and strategy creation that helps predictably influence learner motivation and the design of appealing learning environments. The next chapter will describe such a process.