

# *What Is Motivational Design?*<sup>1</sup>

John M. Keller

Florida State University

June, 2006

---

<sup>1</sup> This manuscript is a revised and expanded version of a previously published encyclopedia article (Keller, 1988).

# Contents

*Definition of Motivational Design*.....3

*Motivational Design Models*.....5

Person-Centered Models 5

Environmentally-Centered Models 6

Interaction-Centered Models 6

Omnibus Models 8

*Obstacles to Motivational Design*.....8

*Conclusion*.....9

## Definition of Motivational Design

Motivational design refers to the process of arranging resources and procedures to bring about changes in motivation. Motivational design can be applied to improving students' motivation to learn, employees' motivation to work, the development of specific motivational characteristics in individuals, and to improving peoples' skills in self-motivation. 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 "charismatic" motivational speakers and workshops whose aims are largely in the area of emotional arousal and are grounded in a blending of personal experiences, psychological principles, and intuition. 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.

The primary focus of this introduction to motivational design is on the motivation to learn and refers specifically to strategies, principles, and processes for making instruction appealing. This adds another dimension to the traditional view of instructional design as being the process and technique of producing efficient and effective instruction. Efficiency refers to economy in the use of 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.

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*. In other words, it is assumed that instruction will be effective if it is presented to the defined target audience, something is done to get their attention as in Gagné's first event of instruction (Gagné, 1965; Gagné, Briggs, & Wager, 1992), and they are reinforced 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 (Keller, 1983). 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 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 was the book about."

Child: "I don't know."

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. This 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 when they 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 that of motivational design versus behavior modification. Teachers and employers sometimes have to deal with people who have severe problems with low 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, even though motivational design draws upon many of the same underlying concepts and theories of motivation. Motivational design can lead to 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.

## Motivational Design Models

Motivational design models can be categorized into four groups. 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. The fourth group has a more pragmatic, or pedagogical, origin and includes omnibus models that incorporate both instructional design and motivational design strategies. These models tend to grow out of solutions to specific kinds of instructional problems. The following overview summarizes the primary examples of variables and models in each category, but does not include detailed descriptions or reviews of research on each one.

### Person-Centered Models

These models are grounded primarily in psychological constructs or theories that represent aspects of the motivational dimensions of personality. They tend to postulate that people have drives, potentials, values, and motives that influence personal motivation and development. They assume that the primary impetus for psychological growth and development comes from within the individual. Psychological theories in this area include such things as the work on curiosity (Berlyne, 1965) and sensation seeking (Zuckerman, 1971), and the succession of people such as (Maslow, 1954), (Herzberg, 1968), and (White, 1959) who are concerned with human motives and self fulfillment.

Examples of empirically validated contributions to motivational design in this area are provided by McClelland (McClelland, 1961; McClelland, 1965) , (Alschuler, Tabor, & McIntyre, 1971), Simon (Simon, Howe, & Kirschenbaum, 1978), and (Bandura, 1977). McClelland's (1965) paper contains a model for bringing about changes in a person's need for achievement. It was used in many workshops, and was at the heart of the system developed by Alschuler who focused on the problem of increasing achievement motivation among school children. His approach, called psychological education, was concerned with changing behavior and improving self-motivation by strengthening this motive rather than simply making instruction more appealing.

Similarly, Simon et al. concentrated on developing strategies for helping children to be more articulate about their values, more self-aware, and more analytical. His model is not a true motivational design model as it concentrates on behavioral change, but both his model and Alschuler's are fruitful sources of examples and ideas that can be used in a motivational design model to help make the instruction relevant to the students' needs and desires.

Bandura (1977) provides a model for improving self-efficacy, which refers to one's belief that one can accomplish a desired behavior or

goal. This construct is part of Bandura's social learning theory, which falls below under interaction-centered models, but because there is a model specifically focusing on the strengthening of this belief and there has been extensive research on this variable in isolation from the overall theory, it can also be included as a person-centered model.

## Environmentally-Centered Models

These models assume that behavior can be adequately explained in terms of environmental influences on human volition. Many researchers are associated with this school of thought, but B. F. Skinner who is probably the best known, applied these concepts to education (Skinner, 1968) in a form that can be called motivational design model even though his approach 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 (see (Markle, 1969) for a review and explication of this approach).

Skinner's instructional design approach was expanded by (Keller, 1968) into a plan for designing and implementing whole courses of instruction. Called The Personalized System of Instruction (PSI), or The Keller Plan, 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.

In a different approach, (Sloane & Jackson, 1974) provide 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 the 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 (for example, see (Lepper & Greene, 1978), but has promise for succeeding when there is initially no intrinsic motivation on the part of the learner. However, as have shown, intrinsic motivation can be decreased by extrinsic reward systems, and can be very difficult to establish initially, or reestablish after being diminished.

## 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 (see (Keller, 1983), 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. (DeCharms, 1976) and Hunt (Hunt & Sullivan, 1974) have offered theories and reviews of motivational research that focus on the interactions of individual traits with environmental influences on behavior. Environmental influences can include 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, 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. His model has many strategy selections, and is of primary benefit as an aid to classroom teachers.

(Keller, 1983) has developed a motivational design model that is grounded in expectancy-value theory, reinforcement theory, and cognitive evaluation theory. These theories are integrated by means of a systems analysis of when and how each explains the relationships among effort, performance, and satisfaction. This model contains four categories of motivational variables: attention, relevance, confidence, and satisfaction (ARCS). These were derived from a comprehensive review and synthesis of motivational concepts and research studies. The ARCS model is unique among current motivational design models in that it is a problem solving model which helps a designer identify and solve specific motivational problems related to the appeal of instruction. It includes strategies related to the design of materials, style of teaching, and overall design of a course (Keller, 1987a, 1987b, 1999a). It has been validated in numerous studies with all education levels and in many different cultures.

## Omnibus Models

These 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) 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).

## Obstacles to Motivational Design

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 unstable nature of motivation, and is related to the difficulties in establishing a useful theory of motivation. Unlike ability, which is a fairly stable and predictable human characteristic, motivation includes many factors which range from highly transitory states of arousal to reasonably enduring preferences for given types of activities. Furthermore, the intensity of these factors can vary tremendously over short periods of time, and they generally have a nonlinear, 'inverted U—curve,' relationship to performance. As motivation, or arousal, increases, the quality and quantity of

performance increases to an optimal level. 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 anxiety. Performance is less than optimal at either end of the curve.

Another aspect of this problem is the multiplicity of motives and goal orientations of individuals. At one level, 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 on need for affiliation. Yet, both of these motives can be overridden by a motive, such as the need for physical security, that assumes a higher priority in a given situation. This variability is a challenge to anyone who tries to develop models of motivational design.

The second problem, which is that of measurement, is closely related to the preceding. Just as it is difficult to obtain a functional theory of motivation, it is difficult to measure the important elements of influence and change in motivational design. There are four, and probably more, sets of variables that have to be considered in motivational design. 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.

## Conclusion

There is little doubt that there is a growing interest in the problem of motivation, both in relation to understanding learners, and in relation to motivational design. There are professional organizations in the United States, the Netherlands, and perhaps other countries, that are concerned exclusively with problems of motivation in education, and the number of articles on motivation in educational research journals is growing.

Despite this increased activity, there is still very little work on the specific problem of motivational design. (Wlodkowski, 1984) has developed an effective program for helping researchers learn how to help unmotivated students, and (Keller, 1979, 1983, 1999a) has developed a more theory-based, generic model for identifying motivational strategy needs and options. His model is intended for

instructional designers, trainers, and teachers. However, all of this work will benefit from an increase in the number of people who are developing and testing alternative approaches.

The ability of educational designers to create instructional systems that are effective for students who *want* to learn has grown tremendously in the last several decades. But what is the status with regard to motivation to learn? In 1988, Keller indicated in an encyclopedia article (Keller, 1988), which provides the basis for this article, that there was a lag in knowing how to systematically develop effective motivational components of instruction. However, he indicated at that time that motivation was likely to receive more research and development in the future. This has certainly proven to be the case. Now, there is a voluminous literature on this subject and there are even books, such as (Brophy, 1998) on the motivation to learn. There have also been positive developments in regard to integrating knowledge regarding the motivation to work (Keller, 1999b). However, there are still many avenues to explore, especially in regard to learner motivation in technology-based instructional environments and in regard to the challenge of integrating motivational design with instructional design.

## REFERENCES

- Alschuler, A. S., Tabor, D., & McIntyre, J. (1971). *Teaching achievement motivation: Theory and practice in psychological education*. Middletown, CT: Education Ventures, Inc.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*, 191 - 215.
- Berlyne, D. E. (1965). Motivational problems raised by exploratory and epistemic behavior. In S. Koch (Ed.), *Psychology: A study of a science* (Vol. 5). New York: McGraw-Hill.
- Brophy, J. E. (1981). Teacher Praise: A Functional Analysis. *Review of Educational Research*, *51*, 5 - 32.
- Brophy, J. E. (1998). *Motivating Students to Learn*. New York: McGraw-Hill.
- DeCharms, R. (1968). *Personal Causation*. New York: Academic Press.
- DeCharms, R. (1976). *Enhancing motivation change in the classroom*. New York: Irvington Publishers, Inc.
- Deci, E. L., & Porac, J. (1978). Cognitive evaluation theory and the study of human motivation. In D. Green (Ed.), *The hidden costs of reward*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Duffy, T. M., Lowyck, J., & Jonassen, D. H. (1993). *Designing environments for constructivist learning*. New York: Springer-Verlag.
- Gagné, R. M. (1965). *The conditions of learning*. New York: Holt, Rinehart and Winston, Inc.
- Gagné, R. M., Briggs, L. J., & Wager, W. W. (1992). *Principles of Instructional Design* (4th ed.). New York: Harcourt Brace Jovanovich College Publishers.
- Herzberg, F. (1968). One More Time: How Do You Motivate Employees? *Harvard Business Review*, *46*(1), 53 - 62.
- Hunt, D. E., & Sullivan, E. V. (1974). *Between Psychology and Education*. Hinsdale, IL: Dryden.
- Joyce, B., & Weil, M. (1972). *Models of Teaching*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Keller, F. S. (1968). Goodbye Teacher. *Applied Behavior Analysis*, *1*, 78 - 79.
- Keller, J. M. (1979). Motivation and instructional design: A theoretical perspective. *Journal of Instructional Development*, *2*(4), 26 - 34.
- Keller, J. M. (1983). Motivational design of instruction. In C. M. Reigeluth (Ed.), *Instructional design theories and models: An overview of their current status*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Keller, J. M. (1987a). Strategies for stimulating the motivation to learn. *Performance & Instruction*, *26*(8), 1 - 7.
- Keller, J. M. (1987b). The systematic process of motivational design. *Performance & Instruction*, *26*(9), 1 - 8.
- Keller, J. M. (1988). Motivational design. In U. C. (Ed.), *Encyclopaedia of Educational Media Communications and Technology* (2nd ed.), pp. 406 - 409). Westport, CT: Greenwood Press.

- Keller, J. M. (1999a). Motivation in Cyber Learning Environments. *International Journal of Educational Technology*, 1(1), 7 - 30.
- Keller, J. M. (1999b). Motivational Systems. In E. Keeps (Ed.), *Handbook of Human Performance Technology* (2nd ed.). San Francisco: Jossey Bass Inc.
- Lepper, M. R., & Greene, D. (1978). *The hidden costs of reward: New perspectives on the psychology of human motivation*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Markle, S. M. (1969). *Good Frames and Bad: A Grammar of Frame Writing* (2nd ed.). New York: Wiley.
- Maslow, A. H. (1954). *Motivation and personality*. New York: Harper & Row.
- McClelland, D. C. (1961). *The achieving society*. Princeton, N.J.: Van Nostrand.
- McClelland, D. C. (1965). Toward a Theory of Motive Acquisition. *American Psychologist*, 20, 321 - 333.
- Simon, S. B., Howe, L. W., & Kirschenbaum, H. (1978). *Values Clarification*. New York: Hart Publishing Company.
- Skinner, B. F. (1954). The science of learning and the art of teaching. *Harvard Educational Review*, 24, 86 - 97.
- Skinner, B. F. (1968). *The Technology of Teaching*. New York: Appleton-Century-Crofts.
- Sloane, H. N., & Jackson, D. A. (1974). *A Guide to Motivating Learners*. Englewood Cliffs, N.J.: Educational Technology Publications.
- Van Merriënboer, J. J. G., Kirschner, P. A., & Kester, L. (2003). Taking the Load Off a Learner's Mind: Instructional Design for Complex Learning. *Educational Psychologist*, 38(1), 5-13.
- Weil, M., & Joyce, B. (1978). *Information Processing Models of Teaching*. Englewood Cliffs, NJ: Prentice Hall, Inc.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 78, 44 - 57.
- Wlodkowski, R. J. (1984). *Motivation and teaching: A practical guide*. Washington, D. C.: National Education Association.
- Zuckerman, M. (1971). Dimensions of sensation seeking. *Journal of Consulting and Clinical Psychology*, 36, 45 - 52.