From concepts of motivation to its application in instructional design: Reconsidering motivation from an instructional design perspective

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Abstract

This paper explores the concepts of motivation, including extrinsic motivation and intrinsic motivation. It describes how motivation becomes a major concern in the field of instructional design (ID). Furthermore, a motivation model—the ARCS model—is identified and discussed. Finally, it provides an example of how to apply the motivational design process in ID. The aim of this paper is to facilitate a deeper understanding of motivation and to inform professionals about its importance in learning

Introduction

The term 'motive' came from a Latin root meaning 'to move'. It is the 'why' of behaviour and is defined as a desire that urges us to do something (Charles & Senter, 1995). Motivation is an internal state or condition that arouses us to action, directs and persists our behaviour, and engages us in certain activities (Franken, 1994; Kleinginna & Kleinginna, 1981; Ormrod, 1999). In a classroom context, motivation refers to students' subjective experiences, particularly students' willingness to participate in class activities and their reasons for doing so (Brophy, 1998). In a business environment, motivation helps us pursue a goal, persist in our decision and determine how much effort to spend on tasks (Clark & Estes, 2002).

Extrinsic motivation

Extrinsic motivation occurs when the cause of motivation exists outside of an individual and the task performed (Ormrod, 1999). It 'arises from environmental incentives and

consequences (e.g., food, money)' (Reeve, 2005, p. 134). The goal of the behaviour is considered to be the reason for performing the behaviour (Wlodkowski, 1977). For many decades, educational psychology literature was dominated by reinforcement theories of motivation (Stipek, 1996). Thorndike (1898) introduced a theory of learning that emphasised stimulus–response connections, which is now known as connectionism. He stressed the importance of rewards in the learning process, and his view that rewards promote learning continues to be a key component of today's behaviourist perspectives. Pavlov (1927) built his theory of classical conditioning to explain how people develop involuntary responses to particular stimuli. Classical conditioning takes place when two stimuli (conditioned and unconditioned stimuli) are presented at approximately the same time. Influenced by Pavlov and Watson, Skinner (1938) proposed the operant conditioning theory, which spoke only about the strengthening of responses. Operant conditioning occurs when a response is followed by a reinforcing stimulus. Both classical conditioning and operant conditioning are useful in explaining different learning phenomena. Hull (1943) introduced organismic characteristics into behaviourist learning and proposed that intervening variables unique to each organism should be considered when predicting the occurrence of a response. His emphasis on intervening variables made motivation a prominent concept in the research of learning.

Need theories were among the first motivation perspectives that emerged as an alternative to reinforcement theories. One motivation model based on need theory that has remained popular and influential is Maslow's (1962) hierarchy theory (Brophy, 1998). Maslow suggested that people have five different sets of needs: (1) physiological needs; (2) safety needs; (3) love and belongingness needs; (4) esteem needs; and (5) needs for self-actualisation. The five sets of needs form a hierarchy and must be satisfied from lower to higher order. Although Maslow's hierarchy theory has been challenged over years in the field of management (Bobic & Davis, 2003), it is considered a helpful motivation model that reminds us that we must first address students' lower needs in order to motivate them to fulfil the higher order needs that are associated with school learning (Brophy, 1998). Similar to Maslow's theory, Reeve (2005) organised types of needs within a need structure, including physiological needs (thirst, hunger and sex), psychological needs (autonomy, competence and relatedness) and social needs (achievement, affiliation and power). In addition to need theories, Atkinson's (1964) expectancy x value theory suggested that individuals' persistence and efforts spent on the task are determined by the value of the task and their expectancy to succeed.

Intrinsic motivation
Intrinsic motivation occurs when the cause of motivation exists within an individual and task (Ormrod, 1999). It 'emerges spontaneously from psychological needs, personal curiosities, and innate strivings for growth' (Reeve, 2005, p. 134). The 'doing' of the behaviour is considered to be the reason for performing the behaviour (Wlodkowski, 1977). In intrinsic motivation, the emphasis shifted from reinforcement to self-determination and self-regulation of actions (Brophy, 1998). White (1959) advocated that as an innate characteristic, people have an intrinsic need to feel competent. Other

motivation theorists claimed that people have a need to feel self-determining (Deci & Ryan, 1985). Self-determination refers to the idea that people want to believe they can choose to engage in activities of their own volition. The thoughts of 'I want to do something' rather than 'I have to do something' reflect a higher sense of self-determination. People are more likely to engage in tasks for longer periods, to think meaningfully about the tasks, to find pleasure in the tasks and to make greater achievement when circumstances confirm their feelings of self-determination (Deci & Ryan, 1987). Deci and Ryan (1985, 1987, 1992) believed that intrinsic motivation is more likely to be present when competence and self-determination exist.

While extrinsic motivation promotes successful learning and productive behaviour, extrinsically motivated learners may exert minimal effort to perform a task and may stop an activity when reinforcement discontinues. Intrinsic motivation has several advantages over extrinsic motivation. First of all, intrinsically motivated learners are more likely to select challenging tasks. Second, evidence suggested that learners gain more knowledge when they read material that they consider intrinsically interesting. Third, the conditions that support intrinsic motivation also promote greater creativity and better conceptual learning. Fourth, intrinsic motivation is associated with greater pleasure and more active involvement in activities (Grolnick & Ryan, 1987; Stipek, 1996, 2002). When a person is intrinsically motivated, he or she does not rely on extrinsic incentives; instead, he or she relies on the pleasure, interest, enjoyment and competence obtained from participating in activities (Reeve, 2005).

Csikszentmihalyi (2000) adopted the term 'flow' in his study when he conducted numerous interviews with people and discovered that people who perform activities for its own sake frequently used the term 'flow' to describe their experiences. His theory of flow depicted people's willingness to perform activities because of internal motivations rather than external rewards. Therefore, people in flow can be regarded as being intrinsically motivated in performing tasks (Csikszentmihalyi, 1990; Shin, 2006). Csikszentmihalyi indicated that flow occurs at peak moments of experience. He called the feelings of concentration, absorption, deep involvement, joy and sense of accomplishment 'flow' because people who experienced such feelings said that during those moments they acted spontaneously, as if carried away by the tides of a current. People engage in the state of flow when they concentrate on the task without thinking about success or failure but are still aware of the goals of the task. In other words, flow is an overt result of intrinsic motivation when people become absorbed in challenging activities (Csikszentmihalyi, 1990, 1994, 1996).

Motivation as a major concern in instructional design (ID)
Whereas the history of ID (also referred to as instructional development and instructional technology) can be traced back before the 1920s when Thorndike established a knowledge base for human learning, it was not until the 1960s that the essence of today's ID emerged (Shrock, 1995). At the early evolving stage of ID, there were only two considerations of motivation. One was the behaviourists' view of reinforcement theories on behaviour; the other was an alternative perspective that focused on gaining

learners' attention before they will learn (Keller, 1979; Keller & Litchfield, 2002). Despite the large amount of existing psychological literature and research on motivation, none of them provided an approach to integrating motivation in ID (Keller & Litchfield, 2002). Cooley and Lohnes (1976) and Cronbach and Snow (1976) mentioned the lack of systematic attention to motivation in instructional theory and technology, to understanding motivation in individuals, and to developing a technology for influential motivation.

Concerns in this area began to rise during 1979 when Keller published an article that described the inadequate attention to motivation in ID and introduced an approach to incorporate motivation into the design of instruction. The interest in motivation and its integration into ID slowly grew after the publication of Keller's (1979) article. Then the work of Wlodkowski and Ginsberg (1995), Wlodkowski (1999) and Brophy (1983, 1998) and the continued work of Keller (1987a, 1999) resulted in an exponential growth in the interest in motivational influences in instruction and learning (Keller & Litchfield, 2002). There has also been an increasing number of studies that stimulate the concern about motivation and learning, such as that of Small and Gluck (1994), Means, Jonassen and Dwyer (1997) (Keller & Litchfield, 2002).

ARCS motivation model
The ARCS model originated in 1979 and was grounded in expectancy-value theory, which assumed that people will be motivated to engage in the activities if they perceive there is a positive expectancy to be successful and if the activities are linked to the satisfaction of their needs. In its original form, the two categories—expectancy and value—were expanded to interest, relevance, expectancy and outcomes. After several years of research and application, the original model was transited to the ARCS model, which includes four conditions: attention, relevance, confidence and satisfaction (Keller, 1984, 1987a). The first letter of each condition composes the word ARCS, which is known as the ARCS model today (Keller & Kopp, 1987). According to Keller (1984), the ARCS model is 'a system for improving the motivational appeal of instructional materials, of instructor behaviour, and of the way in which lessons (or modules) and courses are designed' (p. 140). The model contains three distinctive features. First, it has four conceptual conditions that subsume psychological research and motivational prescriptions that characterise human motivation. Second, it comprises sets of strategies that can improve the motivational appeal of instruction. Third, it incorporates a motivational design model that can be integrated effectively with other ID models (Keller, 1983, 1984, 1987a).

The ARCS model identified four conditions that need to be fulfilled for people to become and remain motivated. Each of the four conditions is described in succeeding discussions. Attention is the first element and is a prerequisite for learning. The motivational concern is to gain and sustain attention. To stimulate and sustain the learner's attention, the instructor can introduce unexpected events to arouse the learner's curiosity and interest. Relevance comes into play after the learner's attention has been obtained. The learner is more likely to be motivated if the content of the instruc-

tion responds to his or her perceived needs. Nevertheless, relevance does not have to come from the instructional content. Rather, it can come from the way things are taught, such as the cooperation strategies used in the classroom. Besides being interested and perceiving the relevance of the instruction, it is necessary for the learner to believe that there is an acceptable probability to succeed for them to be motivated. This expectancy for success is synonymous with confidence. Confidence influences the learner's persistence and achievement. The final step in the ARCS model is to promote satisfaction. If learners feel good about the consequences and if the learners' efforts are consistent with their expectations, they will continue to be motivated towards learning (Keller, 1984, 1987a, 1987b; Keller & Suzuki, 1988).

Applying the ARCS model in ID

The ARCS model delineates how to understand the motivation to learn in terms of four conditions: attention, relevance, confidence and satisfaction. Besides these four conditions that comprise the ARCS model, the second major component of the ARCS model, called motivational design, provides a systematic design framework that can be integrated into typical ID models. The motivational design process can be separated into the steps of define, design, develop and pilot. The define phase has three purposes: to identify the general level of learner motivation (audience analysis), to generate motivational objectives and to prepare methods for assessing the motivational objectives. Steps in the design phase include creating potential motivational strategies for each motivational objective, selecting appropriate strategies and integrating the strategies into the instructional content. The develop phase involves creating materials that effectively integrate the motivational strategies, enhancing existing instructional products and conducting developmental tests. Pilot is the final critical phase. It comprises implementing the instruction to representatives of the target population, administering formative evaluation and revising the instructional product (Keller, 1984, 1987a, 1987c; Keller & Kopp, 1987).

Keller and Kopp (1987) contended that the ARCS model is not an ID model. Rather, it is 'meant to be used in conjunction with instructional-design models' (p. 291). Table 1 illustrates how each step in Keller's motivational design process can be adapted to the ID model developed by Morrison, Ross and Kemp (2004). In the define phase, the ID process begins with the identification of an instructional problem (step 1). Once the knowledge that the learners are supposed to learn has been identified, the next step involves motivational audience analysis (step 2), which is analogous to learner and contextual analysis. Then comes the analysis of instructional task (step 3) in which the outcomes combing with the results of audience analysis provide input to the writing of instructional as well as motivational objectives (step 4). In the design phase, the process begins with sequencing instructional materials (step 5). Next follows selecting instructional strategies (step 6) that incorporates creating potential motivational strategies, selecting strategies and integrating strategies (steps 6, 7 and 8). In the develop phase, the major task is message design (step 9) that involves creating motivational instruction and improving existing instruction (step 9). Additionally, developmental test is established (step 10) in this phase. A developmental test is

Table 1: Framework for adapting motivational design to the Morrison, Ross and Kemp model

ARCS phase	Instructional design process	Motivational design steps	Interpretations
Define	1. Instructional problem analysis		1. Analyse learner's prior knowledge and needs.
	2. Learner and contextual analysis	2. Motivational audience analysis	2. Define general level of learner motivation, learner characteristics, and environmental factors.
	3. Task analysis		3. Identify the content required to solve the instructional problems.
	4. Instructional objectives	4. Prepare motivational objectives and criterion measures	4. Generate motivational as well as instructional objectives and prepare methods for assessing the objectives.
Design	5. Sequencing		5. Sequence the instructional content to help learner achieve the objectives.
	6. Instructional strategies	6. Create potential motivational strategies	6. Create potential strategies for each motivational objective and instructional objective.
		7. Select strategies	7. Select appropriate strategies.
		8. Integrate strategies	8. Incorporate the strategies into the instructional content.
Develop	9. Message design	9. Create motivational instruction and improve existing instruction	9. Develop materials that effectively integrate the motivational and instructional strategies. Enhance existing instructional product.
		10. Developmental test	10. Conduct developmental tests (formative evaluation).
Pilot	11. Development of instruction	11. Implement with target population representatives	11. Implement the instruction to representatives of the target population.
	12. Evaluation	12. Evaluate motivational outcomes	12. Administer formative evaluation to measure the adequacy of instruction and motivational effects of the instructional materials.
		13. Revise instruction	13. Revise the instructional product.

Note. From "The systematic process of motivational design," by J. M. Keller, 1987c, *Performance and Instruction*, *26*(9), p. 7. Copyright 1987 by J. M. Keller. Adapted with permission.

a formative evaluation process in which drafts of the instructional materials, including the motivational design parts, are presented to experts and representatives of the target population to obtain feedback. During the pilot phase, the entire package of the instructional materials is completed (step 11), followed by evaluation (step 12) and revision (step 13). A critical point in this phase is to include formal assessment of the motivational effects of the instructional materials in addition to measuring learner achievement (Keller, 1987c).

Although the previous example uses the Morrison, Ross and Kemp ID model to demonstrate how to integrate ID and motivational design, the application of motivational design is not limited to the ID model provided here. Okey and Santiago (1991) suggested that when designing instruction, Keller's (1987c) motivational design procedure could be adapted to any ID theories. In this paper, we provide a framework to adapting motivational design to the Morrison, Ross and Kemp model for instructional designers and instructors to recognise the importance of motivation in instructions. We believe that instructional materials with the factor of motivation considered can help learners better enjoy the knowledge acquisition process and benefit most from learning.

References

Atkinson, J. W. (1964). *Introduction to motivation*. Princeton, NJ: Van Nostrand.

Bobic, M. P. & Davis, W. E. (2003). A kind word for theory x: or why so many newfangled management techniques quickly fail. *Journal of Public Administration Research and Theory*, *13*, 3, 239–264.

Brophy, J. (1983). Conceptualizing student motivation. *Educational Psychologist*, *18*, 3, 200–215.

Brophy, J. (1998). *Motivating students to learn*. Boston, MA: McGraw-Hill Companies, Inc.

Charles, C. M. & Senter, G. W. (1995). *Elementary classroom management* (2nd ed.). White Plains, NY: Longman.

Clark, R. E. & Estes, F. (2002). *Turning research into results: a guide to selecting the right performance solutions*. Atlanta, GA: CEP Press.

Cooley, W. S. & Lohnes, P. R. (1976). *Evaluation research in education*. New York: Halsted Press.

Cronbach, L. J. & Snow, R. E. (1976). *Aptitudes and instructional methods*. New York: Irvington.

Csikszentmihalyi, M. (1990). *Flow: the psychology of optimal experience*. New York: Harper & Row.

Csikszentmihalyi, M. (1994). *The evolving self: a psychology for the third millennium*. New York: HarperCollins Publishers.

Csikszentmihalyi, M. (1996). *Creativity: flow and the psychology of discovery and invention*. New York: HarperCollins Publishers.

Csikszentmihalyi, M. (2000). *Beyond boredom and anxiety: experiencing flow in work and play 25th anniversary special edition*. San Francisco: Jossey-Bass.

Deci, E. L. & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.

Deci, E. L. & Ryan, R. M. (1987). The support of autonomy and the control of behavior. *Journal of Personality and Social Psychology*, *53*, 1024–1037.

Deci, E. L. & Ryan, R. M. (1992). The initiation and regulation of intrinsically motivated learning and achievement. In A. K. Boggiano & T. S. Pittman (Eds), *Achievement and motivation: a social-developmental perspective* (pp. 9–36). Cambridge: Cambridge University Press.

Franken, R. (1994). *Human motivation*. Pacific Grove, CA: Brooks/Cole.

Grolnick, W. & Ryan, R. (1987). Autonomy in children's learning: an experimental and individual difference investigation. *Journal of Personality and Social Psychology*, *52*, 890–898.

Hull, C. L. (1943). *Principles of behavior: an introduction to behavior theory*. New York: Appleton-Century-Crofts.

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* (pp. 383–434). Hillsdale, NJ: Lawrence Erlbaum Publisher.

Keller, J. M. (1984). The use of ARCS model of motivation in teacher training. In K. E. Shaw (Ed.), *Aspects of educational technology volume XVII: staff development and career updating* (pp. 140–145). London: Kogan Page.

Keller, J. M. (1987a). Development and use of the ARCS model of instructional design. *Journal of Instructional Development*, *10*, 3, 2–10.

Keller, J. M. (1987b). Strategies for stimulating the motivation to learn. *Performance & Instruction*, *26*, 8, 1–7.

Keller, J. M. (1987c). The systematic process of motivational design. *Performance and Instruction*, *26*, 9, 1–8.

Keller, J. M. (1999). Motivational systems. In H. D. Stolovitch & E. J. Keeps (Eds), *Handbook of human performance technology* (2nd ed., pp. 373–394). San Francisco: Jossey-Bass.

Keller, J. M. & Kopp, T. W. (1987). An application of the ARCS model of motivational design. In C. M. Reigeluth (Ed.), *Instructional theories in action: lessons illustrating selected theories and models* (pp. 289–320). Hillsdale, NJ: Lawrence Erlbaum Associates.

Keller, J. M. & Litchfield, B. C. (2002). Motivation and performance. In R. A. Reiser & J. V. Dempsey (Eds), *Trends and issues in instructional design and technology* (pp. 83–98). Upper Saddle River, NJ: Prentice Hall.

Keller, J. M. & Suzuki, K. (1988). Use of the ARCS motivation model in courseware design. In D. H. Jonassen (Ed.), *Instructional design for microcomputer courseware* (pp. 401–434). Hillsdale, NJ: Lawrence Erlbaum Publisher.

Kleinginna, P., Jr. & Kleinginna, A. (1981). A categorized list of motivation definitions, with a suggestion for a consensual definition. *Motivation and Emotion*, *5*, 3, 263–291.

Maslow, A. H. (1962). *Toward a psychology of being*. Princeton, NJ: VanNostrand.

Means, T. B., Jonassen, D. H. & Dwyer, F. M. (1997). Enhancing relevance: embedded ARCS strategies vs. purpose. *Educational Technology Research and Development*, *45*, 1, 5–17.

Morrison, G. R., Ross, S. M. & Kemp, J. E. (2004). *Designing effective instruction* (4th ed.). New York: John Wiley & Sons.

Okey, J. R. & Santiago, R. S. (1991). Integrating instructional and motivational design. *Performance Improvement Quarterly*, *4*, 2, 11–21.

Ormrod, J. E. (1999). *Human learning* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.

Pavlov, I. P. (1927). *Conditional reflexes*. London: Oxford University Press.

Reeve, J. (2005). *Understanding motivation and emotion* (4th ed.). New York: John Wiley & Sons.

Shin, N. (2006). Online learner's 'flow' experience: an empirical study. *British Journal of Educational Technology*, *37*, 5, 705–720.

Shrock, S. A. (1995). A brief history of instructional development. In G. J. Anglin (Ed.), *Instructional technology: past, present, and future* (2nd ed., pp. 11–19). Englewood, CO: Libraries Unlimited.

Skinner, B. F. (1938). *The behavior of organisms: an experimental analysis*. Englewood Cliffs, NJ: Prentice Hall.

Small, R. V. & Gluck, M. (1994). The relationship of motivational conditions to effective instructional attributes: a magnitude scaling approach. *Educational Technology*, *34*, 8, 33–40.

Stipek, D. J. (1996). Motivation and instruction. In D. C. Berliner & R. C. Calfee (Eds), *Handbook of educational psychology* (pp. 85–113). New York: Prentice Hall International.

Stipek, D. J. (2002). *Motivation to learn: integrating theory and practice* (4th ed.). Boston: Allyn and Bacon.

Thorndike, E. L. (1898). Animal intelligence: an experimental study of the associate process in animals. *Psychological Review Monograph* Supplement, 2, *8*.

White, R. (1959). Motivation reconsidered: the concept of competence. *Psychological Review*, *66*, 297–333.

Wlodkowski, R. J. (1977). *Motivation*. Washington, DC: National Education Association.

Wlodkowski, R. J. (1999). *Enhancing adult motivation to learn: a comprehensive guide for teaching all adults* (Rev. ed.). San Francisco: Jossey-Bass.

Wlodkowski, R. J. & Ginsberg, M. E. (1995). *Diversity and motivation: culturally responsive teaching*. San Francisco: Jossey-Bass.