**Learner Motivation Systems: A Framework for the Analysis and
Design of Learner Motivation**

Don G. Robison

Eastern Virginia Medical School

Learner Motivation Systems: A Framework for the Analysis and Design of Learner Motivation in Instructional Contexts

Learner motivation is fundamental to learning.   It is so important that several key learning theories, behaviorism and social learning theory among them, define learning in terms of motivation. Motivation is foundational to effective learning yet current motivation paradigms are neither sufficiently clear nor practical to allow us to reliably analyze or design for it.   This paper provides an overview of the salient research and practice in learner motivation, and provides a framework for both the analysis of motivation and the design of instructional experiences and environments based on that analysis.

What is motivation? The study of motivation is the study of *why* people do what they do (Beck, 1978). Simply defined, it is what people *desire, choose* to do, and *commit* to do (Keller, 2009).   It is an internal process, but can be inferred from observed choices, effort, intensity, and persistence.   It is what initiates behavior, controls its intensity, maintains behavior, stops behavior, and mediates choice (Weiner, 1992).   One focus of the study of learner motivation is on how goal-oriented activity is initiated and sustained (Ford, 1992; Schunk, Pintrich, & Meece, 2002). Ford (1992) defines motivation as "multidetermined (p. 1)" (i.e., complex) and then described it in terms of the psychological factors that direct, energize and regulate behavior.   It is helpful to recall that the word "motivate" is a derivative of the Latin word, *movere*, which simply means "to move."   Motivation, then, in its broadest sense, is about what makes people move.

Learner motivation is focused on those factors that affect learners' engagement with the task of learning.   From the perspective of the instructional designer, it may be thought of in two ways: as either stimulating and empowering a learner's intrinsic motivation; or, as providing extrinsic motivators that will energize learner engagement.   In reality, motivation is the product of a system of influences that are both internal to the learner and external in the learning environment.

The Learner Motivation Systems Framework: An ARCS Model Framework

In the interest of parsimony, rather than describe the diverse motivational theories that may be relevant to learner motivation, let us present the perspective that Keller's (2009) ARCS Motivation Model is an effective applied motivation model that synthesizes much of the relevant motivation research.   The learner motivation systems framework presented here assumes the ARCS framework as a foundation, then amplifies aspects of ARCS and incorporates additional salient perspectives; in this sense, this framework should be considered a subset of the ARCS framework.

The strength of the ARCS Model.   The ARCS Model uses the individual as the primary unit of analysis and this is its strength and limitation.   Since motivation is, in the end, an internal phenomenon, it is logical to use the individual as the basis for analysis and motivational design. The ARCS Model effectively synthesizes a wide range of motivation research and applies it to instructional design. Some of the research and concepts that form the basis for the ARCS Model include Berlyne's (1965) research into curiosity, arousal and boredom; Deci and Ryan's (1975)

research regarding intrinsic motivation; Duffy, Lowyck, and Jonassen's (1993) authentic learning concepts;   Skinner's (1968) behavioral management research; McClelland's (1984) research regarding achievement, affiliation, and power; Czikszentmihalyi's (1990) research on flow; Bandura's (1977) self-efficacy theory; and Weiner's (1974) attribution theory, to name a few.   The ARCS Model is an excellent synthesis of motivation research, but as mentioned, it centers on the individual as the unit of analysis.

The limitations of the ARCS Model. It is important to emphasize that many of the factors that influence motivation are external to the individual.   The ARCS Model does not sufficiently address collaborative learning, social presence, experience structure (flow), environmental conditions, or experience aesthetic.   In addition, the ARCS Model insufficiently addresses the significant motivational influences of identity leveraging and perception.   While the ARCS model is the most complete applied motivation model available to instructional designers, and while it is user-friendly, it does not currently address many of the key factors that influence motivation.   Therefore, the ARCS model needs to expand.

Expanding the ARCS Model to Incorporate Additional Motivational Perspectives

It is helpful to consider our view of motivation as a complex puzzle with many missing pieces. The ARCS Model brings a framework to the puzzle challenge that helps place many of those pieces.   Research and practice in motivation systems, game design, collaborative learning, group dynamics, flow, computer interface design, movie writing and identity formation provide perspectives that help us to place many of the other motivational puzzle pieces.   None of these perspectives are sufficient to close the issue, but together, they serve to clarify the concepts and challenge. Let us examine these perspectives and develop a holistic framework for viewing learner motivation.   Because we grant the efficacy of the ARCS Model in general, we will not critique or discuss the research from which it was developed, we will accept that as "given." For more information on the research foundations to the ARCS model see Keller (2009).

Motivational Systems Theory.   Like most models of complex processes, the ARCS Model presents affordances and limitations: it clarifies some motivational issues and obscures others.   Ford's (1992) motivational systems theory (MST) describes a systems perspective that enhances the ARCS Model as a supplement to it, even if MST is not the complete answer.   Ford presented motivation as centered in the individual (as does ARCS), but also placed the individual in the biological, social, and environmental contexts (or ecological system) that impact motivation.   He referred to this perspective as viewing the "person-in-context (p. 19)."   In other words, motivation is not only focused on the individual, but also on the individual's interaction with their environment. The study of motivation, then, looks at individual elements of motivation, their relationships with each other, but also studies the interaction of all of this with the environment.   This systems perspective provides a more robust view of motivation.   The ARCS Model does not explicitly provide systematic processes for placing the individual in the motivational context of learning or performance.

While MST provides helpful insight towards a systems perspective on motivation, it is not a complete paradigm. For example, MST combines all environmental factors into a construct called 'a responsive environment,' not providing sufficient detail to allow for practical motivational analysis or design. In addition, MST does not include the motivational influence of the structure or flow of an experience.   A new useful motivation framework should provide the

systems perspective introduced by MST, use the strengths of the ARCS Model, and include salient motivation research not explicitly addressed in either the ARCS Model or MST.

Flow Theory.   Flow theory is a way of describing the phenomenon where people are caught up in the flow of an activity or game and so enjoy themselves that they lose track of time and orientation. Czikszentmihalyi (1990) defined flow as "…the state in which people are so involved in an activity that nothing else seems to matter". Rieber (1996), like Malone (1987), held that the most important element in the creation of a flow experience is optimizing the challenge.   This idea is consistent with Keller's ARCS Model as the optimal state for learner confidence (1987). How important is flow in motivational design?   People actively seek flow experiences, and will expend energy and resources to find them (Gee, 2008).

How is flow created? According to Rieber (1996), enjoyment results when an activity includes one or more of the following components:
- Challenge is optimized.
- Attention is completely absorbed in the activity;
- The activity has clear goals;
- The activity provides clear and consistent feedback as to whether one is reaching the goals;
- The activity is so absorbing that it frees the individual, at least temporarily, from other worries or frustrations;
- The individual feels completely in control of the activity;
- All feelings of self-consciousness disappear; and
- Time is transformed during the activity (e.g. hours pass without noticing) (Rieber, 1996).

Lessons from Game Design: Malone's Motivation Theory. Malone (1981) asked two key questions: first, why are computer games so captivating? And second, how can the things that make computer games so captivating be used to make learning—particularly learning with a computer—captivating?   In other words, Malone asked how learning could be developed that mimicked the flow experience of games.   Malone proposed three relevant motivational design factors: challenge, curiosity, and fantasy.   Later, Malone and Lepper (1987) added a fourth motivational factor: learner control.   Malone's four motivational design factors:

- **Challenge.**   Malone held that goal-setting was a key part of developing a game that was intrinsically motivating. Goals should be personal, giving the player a sense of personal capability (Malone, 1981).
- **Curiosity.** Malone believed, consistent with Berlyne's (1965) findings, that optimally motivating experiences would have an optimal level of information complexity.   An effective game or learning experience will engage learners with its complexity and stimulate them to want to bring unknown aspects of the subject to cognitive resolution (Malone, 1981).
- **Fantasy.**   Malone proposed that fantasies can make gaming or instructional environments more interesting.   He defined fantasy in this context as "mental images of things not present to the sense or within the actual experience of the person involved (Malone, 1981, p. 360)."
- **Control.**   Giving learners control of contingencies, choices, and power will increase learner motivation (Malone & Lepper, 1987).

Collaborative Learning and Group Dynamics.   The phenomenal success of social networking sites points to the value that people place on social connection.   Sites like *Facebook*® and *Linked-In*® boast millions of users each.   But how does this value translate into energizing learners for the learning task?   First, though the ARCS model addresses aspects of social learning, including vicarious learning and self efficacy, it does not appropriately address broader social learning variables related to learner motivation, including such variables as group affiliation and peer networks, collaboration, optimal synergy, and presence. Each of these variables has a significant demonstrated impact on learner motivation and achievement and yet are under-represented in the ARCS Model.

Researchers from various theoretical orientations agree on the basic principle that people are social creatures, and social factors influence learning motivation. Social learning theorists, for example, argue that much of what one learns is learned from the example of others (Bandura, 1977; Bruning, Schraw, Norby, & Ronning, 2004). Cognitive learning theorists maintain that much of learning is devoted to "meaning making" which is essentially a collaborative and social process (Bruning, et al., 2004). Interestingly, Hacker and Bol demonstrated that the mere potential presence of others affects individual cognition and behavior (Hacker & Bol, 2004). One does not have to fully adopt all of these perspectives to grant that social factors powerfully influence learner motivation. Palincsar (1998) held that learning and understanding are inherently social, that meaning making is a social process; she presents constructivist approaches, such as reciprocal teaching, where students teach to learn, as necessarily social. It is difficult to argue against Palincsar's observation that both the development of the community instructional plan and the process of learning itself are sociocultural processes.

Visual Design. Though preferred styles vary, global cultures are almost universally visual cultures, and becoming more so with time (David & Gore, 2010; Pink, 2005).   Specifically, visual design plays a significant role in user perspectives of credibility and quality of computer applications.   Internet users assess the credibility of websites primarily by their visual design (Fogg et al., 2002).   The importance of visual design for the web extends to computer-based simulations because of their similarity. Keller (2009) places this visual "excellence" dimension in the "Attention" factor of the ARCS Model, but it is possible that this visual or aesthetic variable is also foundational to learner perceptions of relevance and satisfaction.

In fact, the aesthetic has a systemic role in motivation; it broadly impacts memory and recall at several levels of cognitive processing.   To the degree that one grants the premise that learning is an experience and that the most resonant experiences "win" mind-share and memory-share, the importance of visual design—of aesthetic design—becomes obvious.   Dewey (1938) described learning as experience, as did Gagne (1965).   Parrish (2009) described this approach of including an aesthetic and experiential emphasis in learning design as a holistic approach and presents compelling linkages between aspects of aesthetic design and learning theory.

How important is visual design or aesthetic?   The answer is that it varies from individual to individual, and from culture to culture, but there appears to be a generalized positive effect caused by an attractive visual aesthetic. Dion, Birsheid, and Walster (1972) demonstrated that people make generalized positive predictions about other people based on physical attractiveness.   In their seminal study, students projected intelligence and competence onto

attractive individuals.   More to the point in our case, Tractinsky, Katz, and Ikar (2000) found a similar generalized effect with attractive computer interface designs.   Subjects in their research judged software as more usable—regardless of its actual performance—simply because it was aesthetically pleasing.   Others have qualified these findings (Lindgaard & Dudek, 2003; van Schaik & Ling, 2006), but the general principle still holds: In general, with interface design, what is "beautiful" is also judged as "usable."

Pink (2005) claimed that as a culture visual design is becoming more important.   He used the example of toilet brushes on sale at *Target*®.   In his example, the toilet brushes at *Target*® were not only useful for their intended task, but visually attractive, having been designed by noted designers.   Several factors feed this design-centric trend: a cultural value for entertainment, growing sophistication in visual and cinematic composition, and the widespread use of visualization software.   What was once the elite arena of professional visual artists has become accessible to normal people with relatively modest means.   The widespread use of visualization software (vector, 3-D, and photo-editing) has put professional looking graphics production capability into the hands of many, and this in turn has made our collective palate for visual design more sophisticated and our expectations for visual design in even the most utilitarian objects have risen markedly.

Game developers often put a great deal of emphasis on visual design. Note the visual detail and attractiveness of the screenshot from the popular *Atari*® game, *The Witcher 2* (CD Projekt, 2011), pictured in Figure 1 below.   Great care has been taken in depicting characters and environments that may be objectively assessed as 'beautiful.'   This game was developed with such quality that it became a source of national pride in Poland where it was developed, and Polish Prime Minister Tusk presented a copy of the game to President Barack Obama during Obama's official visit to Poland in May 2011 (Rainier, 2011).

Figure 1: *The Witcher 2*: *Assassin of Kings*, Permission of CD Projekt

Lessons from Screen Writers: Structured Story. Screen, theater, and novel writers have made a science of developing story structure patterns that engage users in their products. Parrish (2009) held that effective learning experiences should have "beginnings, middles, and endings (i.e., plots) (p. 519)." He then articulated practical guidelines for building and

incorporating story-like tension in learning experiences.   There are those who claim that stories provide the primary means by which we understand our world: that story provides context, data, and use-cases for how we live (Schank, 1990). The five-act story plot structure, illustrated in Figure 3, is so ingrained in writing practice that its origins are unclear.   Recent neuroscience research has shown that certain patterns of plot engage large percentages of audiences in similar ways (Hasson et al., 2008).   Game developers, as described above, already use stories to create interest in their games.   The practical implication of these guidelines will be presented with the heuristics for the motivational design of instructional simulations below.

The five-act story structure pictured below in Figure 3 is common in novels and cinema as a means for gaining and keeping participant interest.   Such patterns could be assessed and used in instructional simulations for the same purpose.
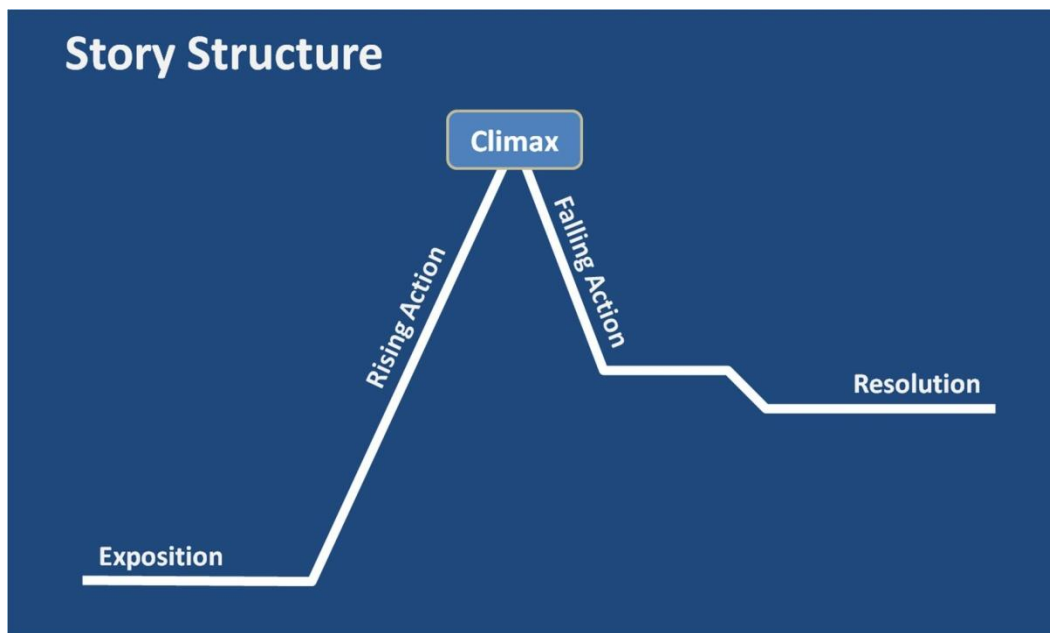

Figure 2. The typical five-act story structure used in literature.

Identity Formation and Identity Leveraging. The search for identity is a primary motivator, particularly for adolescents and young adults. Erikson proposed that this search for 'who I am' and 'what I am capable of' in young adults energized behavior and choice (1980). Since the search for identity is broadly motivating, incorporation of identity facilitating elements would improve the motivational appeal of learning, if appropriate to the simulation objective. Game developers intentionally tap into this motivator.

The U.S. Marines intentionally exercise this principle when they say that one does not work for the Marines, one *is* a Marine.   And, "once a Marine, always a Marine."   If an individual willingly identifies himself or herself as having a particular identity, and if that identity comes with agreed-upon characteristics, then the individual will make choices consistent with that identity.   Lee and Hoadley (2007) refer to this as identity leveraging and observe that game players enjoy the activity.   In *The World of Warcraft* (WoW), players may edit the personality and physical features of their personal avatars to match their fantasies or values (Blizzard, 2010).   *Second-Life* (2011), a virtual micro-world, exists almost exclusively for this purpose: providing users with an outlet to play out roles that express hidden or fantasized aspects of their identity. On its home page, *Second-Life* asks the user the question: "Who will you be?"

Space and Place in Learner Motivation.   The fit of space and place to specific types of learning can have a significant motivational impact.   A concrete example of this is flight simulators.   A flight simulator must emulate the look and feel of the actual airplane, this is especially true with experienced pilots.   An experienced pilot will compare the simulated experience to his or her actual experience (Alessi, 2000), making the design of the simulation space critical.   Further, for a simulator like this to have practical and consistent use, it must be located where student pilots may readily access it.   The principle here is simple: a learning space must match students' expectations and needs, and it must be positioned so that it is practically accessible.

Additionally, a space must be configured to optimally facilitate the interactions that are envisioned to occur within it (Jamieson, Fisher, Gilding, Taylor, & Trevitt, 2000).   It must be configured to match the types of learner-to-learner and learner-to-instructor interactions that will occur, it must be configured to match the flexible needs of the different types of learning experiences that will occur, and it must make optimal use of vertical space.   If learners feel that space is an after-thought, is too small, or that does not match the learning requirements, learner motivation will likely decrease.
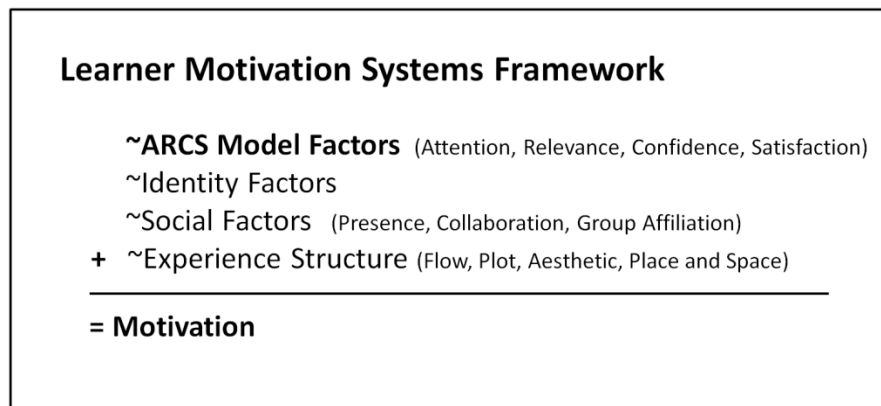
To summarize this section: A new learner motivation systems framework is needed that includes the following attributes:
- The strengths and usability of the ARCS Model
- The systems perspective described in MST that places the person-in-context
- The lessons provided by game developers regarding challenge, curiosity, fantasy and control
- The motivational impact of group affiliation, collaboration, and social presence
- Rieber's perspectives on the creation of flow experiences
- Appropriate attention to aesthetic factors that enhance motivation
- The discovery and use of established patterns of engagement (plotlines)
- The appropriate leveraging of identity to engage learners
- The intelligent use of space and place so that learner motivation is enhanced

The Learner Motivation Systems Framework

The Learner Motivation Systems Framework (LMSF) is presented as an ARCS framework that incorporates a systems perspective and amplifies ARCS to include the motivation research described above. LMSF takes its lead from MST in viewing motivation as the result of a complex system of factors and placing the person in the context of the performance. Chief among these factors are the individual-centered motivation factors that the ARCS Model represents well. In addition, LMSF incorporates processes for analysis and design that optimally use identity leveraging, social and collaborative learning, experience structure, place and space factors, and aesthetic factors to enhance learner motivation. One way to simply represent the LMSF framework is:

Learner Motivation Systems Framework

~**ARCS Model Factors** (Attention, Relevance, Confidence, Satisfaction)
~Identity Factors
~**Social Factors** (Presence, Collaboration, Group Affiliation)
+ ~**Experience Structure** (Flow, Plot, Aesthetic, Place and Space)

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= Motivation

Addressing first objections. At this point, a reader may object that the ARCS Model does address social learning, or that the ARCS Model is so broad that it already includes the proposed additions. Both of these objections are fair and bear discussion. First, the ARCS Model does clearly address social learning factors, but generally from the perspective of Bandura's (1977) social learning theory. It addresses self-efficacy, modeling effects, and several other motivation elements proposed by Bandura. The ARCS Model does not, however, explicitly address the motivational impact of social presence, collaboration or group affiliation, three important social learning dimensions. Second, the ARCS Model is broad enough to include the proposed areas of expansion, which is a testament to its power; but, as currently expressed, it does not practically address motivational factors such as the structure or pattern of the learning experience or the environment. Therefore, an expansion of the ARCS Model is needed that provides practitioners with a framework for dealing with aspects of motivation that the current process descriptions do not sufficiently address.
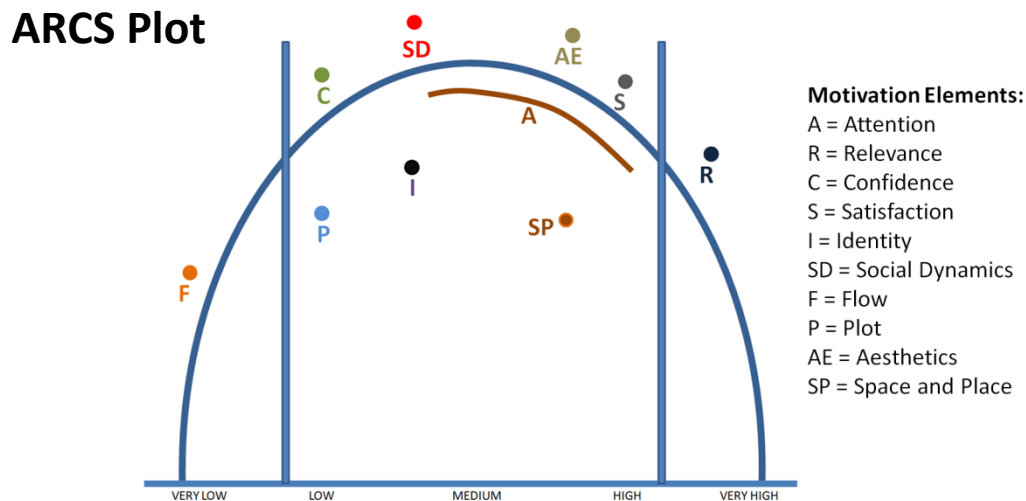
Analyzing Learner Motivation.

The LMSF is an ARCS framework, therefore, the first step is to analyze the current motivational state in relation to the instructional content in accordance with the ARCS process (see Keller, 2009). This process will yield information about the individuals in the learning group in regards to attention, relevance, confidence and satisfaction. A *Learner Motivational Analysis Worksheet* (Appendix A) and *Learner Motivational Analysis Worksheet Directions* (Appendix B) are provided to structure the learner analysis process. The worksheet uses ARCS processes, including Berlyne's (1965) inverted "U", to plot the current level of motivation towards a content area. The worksheet provides the analyst with exploration questions for each

motivation element to aid in assessment.   The analyst's motivation estimate for each element is recorded on the worksheet and then each individual score is transferred to an ARCS plot graph. Using the worksheet, current content-specific motivation is estimated for the following motivational elements:

- Attention (A)
- Relevance (R)
- Confidence (C)
- Satisfaction (S)
- Identity (I)
- Social Dynamics (SD)
- Flow (F)
- Plot Structure (P)
- Aesthetic (AE)
- Space and Place (SP)

Figure 3 is an example of the product of the motivational analysis: an ARCS plot that represents the motivational assessment of each motivational element.

Figure 3: Example of an ARCS Plot

The Product of LMSF Learner Motivation Analysis. The ARCS plot pictured in Figure 3 represents a picture of motivation along several different dimensions.   In this example, a group of learners was analyzed for motivation towards learning to drive a military vehicle. Each point represents the motivational assessment for the identified element. For example, relevance (designated by an "R" on the plot) for this learner group was assessed as "very high." Attention (designated by an "A" on this plot) was assessed as falling along a range from "medium" to "high."   The flow (designated by "F") of the current experience was assed as "very low."   Given this plot, the next step is to develop motivational objectives for the learning experience.   In general, the designer will want to move "low" motivation elements to the right in the learning design.   Sometimes, the designer will want to move "very high" elements a little left—too much motivation towards something can be counter-productive (See Keller, 2009).

The Design and Development of Motivational Components

     Motivational Strategies. Motivational strategies represent the designed plan for addressing the motivational needs.   Once the audience's motivation has been assessed, the designer develops motivational strategies that aim at the specific motivational objectives. Strategies are derived from the answers to key process questions associated with each motivation element.   Table 1 below presents key process questions of each motivational element.

Table 1: Key Process Questions for Identifying Motivational Strategies

Element Categories	ARCS Plot Designation	The Motivational Goal
Attention	A	"How can I make this learning experience stimulating and interesting?"
Relevance	R	"In what ways will this learning experience by valuable for my students?"
Confidence	C	"How can I (via instruction) help students succeed and allow them to control their outcomes?"
Satisfaction	S	"What can I do to help students feel good about their experience and desire to continue learning?"
Identity	I	"How can I (via instruction) help students develop a stronger sense of identity or capacity?"
Social Dynamics	SD	"How can I maximize the benefits of learning with others?"
Flow	F	"How can I create a pleasurable sense of flow in the learning experience?"
Plot or Structure	P	"How can I structure the learning experience to create a rising sense of tension, then a motivating sense of closure?"
Aesthetics	AE	"How can I match the aesthetics of the learning experience to learner needs or expectations?"
Space and Place	SP	"How can I maximize the benefits of space and place for this group of learners in this context?"

     Keller (2009) broke down the key process questions for attention, relevance, confidence, and satisfaction into subcategories that further guide the designer in identifying motivational strategies. Table 2 below presents Keller and Suzuki's (1988) subcategories, and using that same format, provides subcategories to aid the designer in development of motivational strategies for motivational elements outside the traditional ARCS model.   The designer uses this table as a starting place for crafting ideas and strategies to accomplish the motivational goals.

     An example of a motivational strategy that draws on the previous scenario would be reducing the relevance of the training so that learners are not as anxious as they may have been before a designed intervention.   Let us say that in our analysis we discovered that the consequences of poor performance in the training meant that the participant would lose his or her job as a driver for the company.   This would make the training so relevant that some learners would under-perform simply due to anxiety.   The goal could be: "Relevance will be reduced so that learners optimally perform during training and evaluation."   A strategy would be to reduce

the impact of the consequence of not performing well in the training.   In this case, the company may decide to provide three chances to take the assessment at the end of training, or may take away the punitive consequences altogether.   Such a strategy would serve to accomplish the objective of reducing the relevance of the training.

Another example may involve identity.   Let us say that our motivational objective is that learners will choose describe themselves, in part, in terms of the organization.   One strategy may be to provide challenging, but supported, opportunities for success in the context of the mission of that organization.   The U.S. Coast Guard recruit training, for example, puts recruit trainees through a rigorous 48 hour challenge at the end of recruit training, and after successful mastery of the challenge, they are awarded the Coast Guard insignia and called a "Guardian" for the first time.   Graduates often report that as a key identity-forming event in their lives.   The strategy was providing the opportunity for recruits to experience a key success in the context of a Coast Guard challenge.

Table 2: Motivational Design Strategies in the Learner Motivation System Framework

ARCS Dimension		Strategy Subcategory
Attention	A.1	Perceptual Arousal (Keller & Suzuki, 1988)
	A.2	Inquiry Arousal (Keller & Suzuki, 1988)
	A.3	Variability (Keller & Suzuki, 1988)
Relevance	R.1	Familiarity (Keller & Suzuki, 1988)
	R.2	Goal Orientation (Keller & Suzuki, 1988)
	R.3	Motive Matching (Keller & Suzuki, 1988)
Confidence	C.1	Learning Requirements (Keller & Suzuki, 1988)
	C.2	Success Opportunities (Keller & Suzuki, 1988)
	C.3	Personal Control (Keller & Suzuki, 1988)
Satisfaction	S.1	Natural Consequences (Keller & Suzuki, 1988)
	S.2	Positive Consequences (Keller & Suzuki, 1988)
	S.3	Equity (Keller & Suzuki, 1988)
Identity	I.1	Personal Characteristics (Erikson, 1980)
	I.2	Personal Abilities (Erikson, 1980)
	I.3	Leveraging Identity for Fun (Lee & Hoadley, 2007)
Social Dynamics	SD.1	Group Affiliation
	SD.2	Social Presence (Palincsar, 1998)
	SD.3	Collaboration
Flow	F.1	Challenge is optimized (Rieber, 1996)
	F.2	Activity is absorbing (Rieber, 1996)
	F.3	Time is transformed by activity (Rieber, 1996)
Plot/Structure	P.1	Sparkline
	P.2	Entry to learning experience is compelling (Parrish, 2009)
	P.3	Learning experience has resolution that ties together parts (Parrish, 2009)
Aesthetic	AE.1	Visual (Tractinsky, Katz, & Ikar, 2000)
	AE.2	Auditory
	AE.3	Environmental (Jamieson, Fisher, Gilding, Taylor, & Trevitt, 2000)
Space and Place	SP.1	Space: color, volume, novelty
	SP.2	Temperature
	SP.3	Appropriate use of vertical space (Jamieson, Fisher, Gilding, Taylor, & Trevitt, 2000)

Conclusion

        The ARCS Model is the best applied motivation model available to instructional designers but it does not address significant dimensions of motivation. Motivation is best seen as the result of a system that may be intentionally explored and improved.   To fully assess and design a mature motivation system, analysts and designers must address the traditional ARCS elements: attention, relevance, confidence, and satisfaction; but must also address relevant identity, social dynamics, flow, plot, aesthetics, and space and place motivational elements. Practical LMSF tools for analysis and development of motivational strategies were provided as examples of possible approaches. Learning is an act that a learner undertakes and so motivation is fundamental.   Motivation cannot be guaranteed, but it can be systematically designed and encouraged. The Learner Motivation Systems Framework (LMSF) provides one way to maximize the benefits of using the strengths of the ARCS Model while simultaneously addressing other fundamental motivation system elements.

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Learner Motivation Assessment Worksheet

Learner Group: _____
Learning Context: _____
Number of Learners: _____
Are genders equally represented? _____
Average age of learner: _____
Average education level of learner: _____
Important learner or context information: _____

Assessing the Current Motivational State

Directions.   This worksheet is used to assess the current state of motivation towards the learning content area for the target audience. The worksheet directions will guide you through the process. There are questions on the directions sheet that you may use to guide you through the assessment of each motivational element.

Steps:
1. Complete the ten motivational element assessment items on the following two pages.
2. Plot assessment scores on the ARCS plot below. (See directions for details)

ARCS Plot
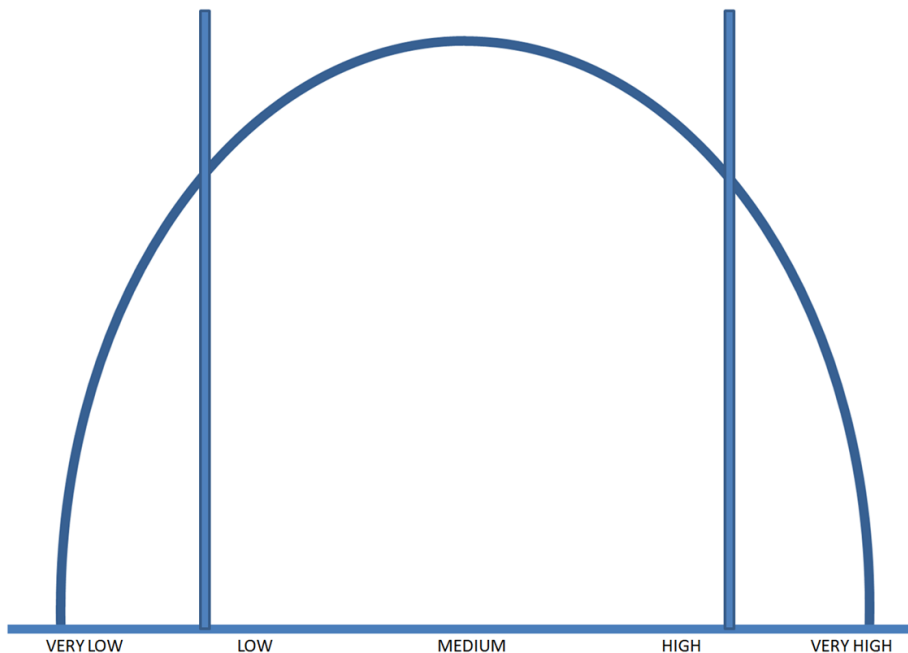
| VERY LOW | LOW | MEDIUM | HIGH | VERY HIGH |

Motivation Elements:
A = Attention
R = Relevance
C = Confidence
S = Satisfaction
I = Identity
SD = Social Dynamics
F = Flow
P = Plot
AE = Aesthetics
SP = Space and Place

Assess the Motivation Elements

Assess the current state of each of these elements towards the learning content (See directions for details). When you complete these items, plot the scores on the ARCS plot on the first page of the worksheet.

1. Motivation Element: **Attention**

❑	❑	❑	❑	❑
Very Low	Low	Medium	High	Very High

2. Motivation Element: **Relevance**

❑	❑	❑	❑	❑
Very Low	Low	Medium	High	Very High

3. Motivation Element: **Confidence**

❑	❑	❑	❑	❑
Very Low	Low	Medium	High	Very High

4. Motivation Element: **Satisfaction**

❑	❑	❑	❑	❑
Very Low	Low	Medium	High	Very High

5. Motivation Element: **Identity Impact**

❑	❑	❑	❑	❑
Very Low	Low	Medium	High	Very High

6. Motivation Element: **Social Dynamics: Group Affiliation, Presence, Contact**

❑	❑	❑	❑	❑
Very Low	Low	Medium	High	Very High

7. Motivation Element: **Flow**

❑	❑	❑	❑	❑
Very Low	Low	Medium	High	Very High

8. Motivation Element: **Plot and Experience Structure**

❑	❑	❑	❑	❑
Very Low	Low	Medium	High	Very High

9. Motivation Element: **Aesthetics**

❑   ❑   ❑   ❑   ❑
Very Low   Low   Medium   High   Very High

10. Motivation Element: **Space and Place Importance**

❑   ❑   ❑   ❑   ❑
Very Low   Low   Medium   High   Very High

Remember, after completing the assessment of each motivational element, return to the first page and plot the scores on the ARCS plot.

Learner Motivation Assessment Worksheet Directions

Assessment of Current Motivational State

Directions.   Before assessing the motivation of the learner group, you will complete the short questions used to describe the group at the beginning at the worksheet.   Then, use your best judgment to assess the current state of motivation towards each learning content area. The worksheet is designed to be used with this directions sheet. Use the guiding questions to assess each motivation element.
Follow this procedure:

1.   Mark the estimated level of motivation for each element on the corresponding line on the assessment sheet.
2.   After you have estimated the level of motivation for each element and marked the assessment sheet, transfer your assessment to the ARCS plot on the first page of the assessment worksheet.
3.   The learners' current level of motivation towards the subject is represented by the ARCS plot.

Step 1: Mark the estimated level of motivation of each motivation element. (You may mark the level as a point or as a range.   See the examples below.)
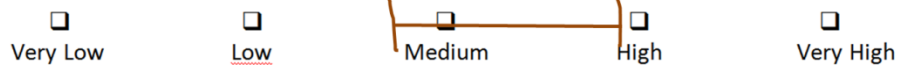
Example of plotting a distinct point:

Motivation Element: **Attention**

❑	❑	❑	☑	❑
Very Low	Low	Medium	High	Very High
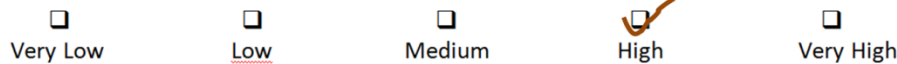
Example of plotting a range:

Motivation Element: **Attention**

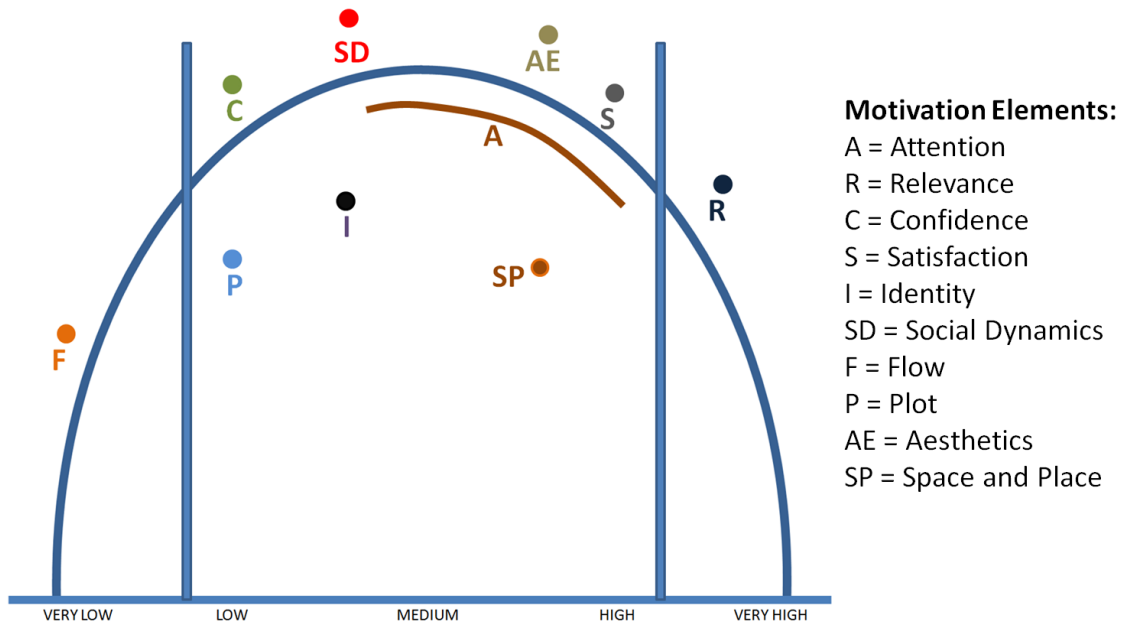| ❑	❑	❑	❑	❑
Very Low	Low	Medium	High	Very High

Step 2: Transfer your assessment from the assessment worksheet to the ARCS plot. All of the elements are plotted on the same ARCS plot (Again, you may mark the level as a point or as a range.)

Example of an ARCS plot with every motivational element plotted. Notice that the point or range is identified by the letter corresponding to the motivational element (e.g., "A" corresponds to *attention*, "AE" corresponds to *aesthetics*, etc.).   This sheet is simply a representation of the plots, the "height" of the plot does not matter, only its left-and-right position related to the level of motivation referenced along the bottom axis of the ARCS plot. (Note: this plot assumes a Yerkes-Dodson curve, meaning that the vertical axis relates to performance level)

ARCS Plot

Motivation Elements:
A = Attention
R = Relevance
C = Confidence
S = Satisfaction
I = Identity
SD = Social Dynamics
F = Flow
P = Plot
AE = Aesthetics
SP = Space and Place

VERY LOW   LOW   MEDIUM   HIGH   VERY HIGH

Understanding the Main Goal for Each Motivation Element

The table below describes the motivational goal for each motivation element.

Element Categories	Plot Designation	The Motivational Goal
Attention	A	"How can I make this learning experience stimulating and interesting?"
Relevance	R	"In what ways will this learning experience by valuable for my students?"
Confidence	C	"How can I (via instruction) help students succeed and allow them to control their outcomes?"
Satisfaction	S	"What can I do to help students feel good about their experience and desire to continue learning?"
Identity	I	"How can I (via instruction) help students develop a stronger sense of identity or capacity?"
Social Dynamics	SD	"How can I maximize the benefits of learning with others?"
Flow	F	"How can I create a pleasurable sense of flow in the learning experience?"
Plot or Structure	P	"How can I structure the learning experience to create a rising sense of tension, then a motivating sense of closure?"
Aesthetics	AE	"How can I match the aesthetics of the learning experience to learner needs or expectations?"
Space and Place	SP	"How can I maximize the benefits of space and place for this group of learners in this context?"

Learner Motivation Element Assessment Questions

Use these assessment questions to guide your motivation assessment worksheet responses.

Motivation Elements	Assessment Questions: Are learners currently engaged by the….
Attention	1. novelty or excellence of the content? (Keller, 2009) 2. questions that arise from the content? (Keller, 2009) 3. variety in the presentation or experience? (Keller, 2009)
Relevance	4. familiarity of the content or presentation? (Keller, 2009) 5. degree to which the content matches their goals? (Keller, 2009) 6. degree to which the contant matches their motives? (Keller, 2009)
Confidence	7. level of difficulty of the learning… is it too easy or too hard? (Keller, 2009) 8. opportunities for success? (Keller, 2009) 9. amount of control they have over the process or learning? (Keller, 2009)
Satisfaction	10. natural consequences of success? (Keller, 2009) 11. positive consequences? (Are they appropriate to the level of achievement?) (Keller, 2009) 12. fairness (or equity) of the learning process? (Keller, 2009)
Identity	13. opportunity to learn about their own capabilities? (Erikson, 1980) 14. opportunity to establish themselves in a valued role? 15. opportunity to "try on" new roles and identities? (Lee & Hoadley, 2007)
Social Dynamics	16. degree of connectedness in the learning community? (Palincsar, 1998) 17. opportunities to create meaning with others? (Palincsar, 1998) 18. challenge and benefits presented by colleagues? (Palincsar, 1998)
Flow	19. learning experience itself? (Rieber, 1996; Czikszentmihalyi, 1990) 20. nature of the learning experience—the challenge, opportunities for expertise, etc. (Rieber, 1996; Czikszentmihalyi, 1990)
Plot or Structure	21. entrance into the learning process? (Parrish, 2009) 22. "story" of the task performance? (Schank, 1990) 23. way the learning experience is resolved or concluded? (Is there an experience that ties all the learning together?) (Parrish, 2009)
Aesthetics	24. aesthetics of the content presentation? (Tractinsky, Katz, & Ikar, 2000) 25. aesthetics of the environment? (Jamieson, Fisher, Gilding, Taylor, & Trevitt, 2000) 26. match of aesthetics to learner audience preferences? (Tractinsky, Katz, & Ikar, 2000)
Space and Place	27. appropriateness of the space? (Jamieson, Fisher, Gilding, Taylor, & Trevitt, 2000) 28. match between activity and space? 29. appropriate use of vertical space? (Jamieson, Fisher, Gilding, Taylor, & Trevitt, 2000)