

## **On the Continuity of Life: Tracing Early Influences on my Career Development, the Creation of the ARCS Model, and the Future**

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*This paper contains information in support of the presentation I made at this conference<sup>1</sup>. However, it is not an exact text of what I said. My presentation included all of the topics in this paper, but not the detail. The presentation was highly visual with a great many photographs. Also, it contained some surprises and specific points of interest that were meaningful in the context of the presentation, but would not be as effective if they were presented here in ordinary prose!*

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### **Introduction**

As the "Last Lecture" celebrating my retirement from my professional career, I will look back at my personal and professional life to share thoughts about my conceptual orientation to the field of Instructional Systems or, in other words, educational media and technology. I will include reflections and stories about events throughout my life that led to this career focus and the development of the ARCS Model which I recently expanded to include volition (the ARCS-V Model). In fact, my first presentation of an early version of this expanded theory of motivation, volition, and performance (MVP) and the ARCS-V model was at this ICoME conference at Kansai University in Osaka in 2004!

### **Why a “last lecture” at this conference?**

On the one hand, it seems strange to be delivering a final lecture here at this conference of Japanese and Korean scholars. But, on the other hand, it seems very natural because of the strong influences that people from both of these countries have had on my career. In my numerous trips to Japan during the past 19 years I have had the pleasure to work with numerous students at Tohoku Gakuin University in Sendai, Iwate Prefectural University in Iwate, and now

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<sup>1</sup>Annual meeting of the *International Conference for Media in Education (ICoME)*, Kumamoto, Japan, July, 2010.

at Kumamoto University. I have also enjoyed the many opportunities that I have had to do presentations at various universities and government agencies such as ICNR. I have appreciated the contributions that researchers in Japan have made to knowledge about motivational design, such as the work of the late Roberto Okada. But most of all I am deeply appreciative of the work of Professor Katsuaki Suzuki in relation to motivation and learning, to the dissemination of the ARCS model, and to the development of tools in support of the ARCS approach to motivational design. And, I greatly appreciate and am honored by the work he and his team have done to translate my recently published (Keller, 2010) book into Japanese so quickly after its publication in the United States. With respect to South Korea, it has been very gratifying to have had numerous Korean students who completed their doctoral dissertations under my sponsorship and who are working in both Korea and the United States. I especially appreciated the opportunity to visit South Korea in 1999 thanks to the efforts of Dr. Sang Ho Song, who was my first Korean student to complete his doctoral work and who collaborated with me on an early version of a book about the ARCS model.

## **The conceptual foundation of instructional systems design (ISD)**

There are many different perspectives and definitions with respect to what this field of instructional systems is. My view, which I described in the latest edition of “Principles of Instructional Design” (Gagné, Wager et al. 2005), is somewhat unique compared to the standard definitions (Seels and Richey 1994; Januszewski and Molinda 2007), but then all of us have somewhat unique perspectives in that we see the world through our own eyes. This, of course, is part of the perspective of constructivist psychology and design which is a reflection of a much older philosophical orientation which Wheelwright (1962) called a perspectivalist philosophy. I am not a constructivist, but neither am I a behaviorist, cognitivist, or post modernist. Each of these schools of thought, and others that I did not mention, can be incorporated into the instructional design process (ISD) because ISD consists of a method of looking at the world combined with an approach to defining and achieving goals. ISD incorporates general systems theory as the means by which we describe phenomena in terms of their component parts and the processes that connect those parts based on inputs and outputs. ISD also incorporates systematic problem-solving processes to guide us in the identification of gaps between the way things are and the way we want them to be, the design of activities that will lead to the accomplishment of our goals, and the development and implementation of those solutions together with an evaluation of the outcomes.

The ISD process includes many complex tools and processes that support everything from needs assessment in order to determine what the real gaps in performance are that we want to close, the types of knowledge and skills and attitudes that people should have to achieve their goals, the design of learning activities, to the design of the learning environments that support the learning process. Specific types of learning theories, such as constructivist, behavioral, or cognitivist can guide the development of learning activities that are most appropriate for accomplishing the defined goals.

I also do not consider ISD to be equivalent with “educational technology” or “educational media” as ways of representing this field. Just as theories of learning support the development

of learning activities, educational technology and media support the development of effective learning environments. But, overall it is ISD that provides the glue and the explanations that combine all of these things. In this sense, ISD is holistic providing both a means for describing the objects of our endeavors and the problem-solving process that we incorporate in trying to bring about improvements in human attitudes and behavior. This means that ISD is challenging; it requires a high level of knowledge and skill to be an expert in all aspects of this field of work. The fact that it is challenging is also what makes it exciting, and this leads into an explanation of why and how I discovered and chose this profession.

### **How and why did I end up in this field?**

There are multiple answers to this question and they can be explained by a variety of events related to serendipity, synchronicity, freakinomics (Levitt and Dubner 2005), and chaos theory (Gleick 1987). Serendipity means more or less the same thing as luck. In other words, it means being in the right place at the right time based on your previous experiences that have brought you to this point. It is not serendipity to learn about a job opportunity in the field of engineering if you have no education or interest related to engineering, but it is serendipitous to discover that there is a fellowship program that is in its final year of funding and matches your professional goals and previous education. This is what happened to me when I was applying to graduate programs in the field of instructional systems which I had only recently discovered. Obtaining that well-funded government fellowship is what enabled me to take my family to Indiana University to work on my doctoral degree. It was also serendipitous that there was a vacant faculty position at Syracuse University the year I graduated from IU.

In contrast, the way I found out about this field was an example of synchronicity. It occurred in a conversation with a fellow teacher at Granite Hills High School in which he told me about the field of educational technology and the graduate programs at the University of Southern California, Michigan State University, Indiana University, and Syracuse University. I had been actively examining my career and planning for the future without knowing exactly what direction I would take. At that time, my goal was to go into psychology, but my colleague's description of educational technology made me realize that it was a field that tied together virtually all of my experiences and interests. This was a meaningful convergence of my readiness to move in a new direction and the discovery of a career field that was "made for me!" Another fabulous example of synchronicity in my life occurred when I met Cecilia, my wife. But, more about that in my presentation!

Another source of influences can be represented by the concept of "freakinomics" which, according to Levitt & Dubner (2005), the inventors of the concept, is based on four fundamental ideas:

1. Incentives are the cornerstone of modern life.
2. Conventional wisdom is often wrong.
3. Dramatic effects often have distant, even subtle, causes.
4. "Experts" use their informational advantage to serve their own interests.

These assumptions provide a dramatically different way, compared to conventional research, of looking at behaviors that are seemingly unrelated or coincidental. For example, they talk about sumo wrestling in which there had long been suspicion but no proof that cheating sometimes takes place. In a sumo tournament, all wrestlers in the top division compete in 15 matches and face demotion if they do not win at least 8 of them. The sumo community is very close-knit, and the wrestlers at the top levels tend to know each other well. The authors found a statistically unlikely probability that a wrestler with 7 wins and 7 losses would win in a contest against a wrestler with 8 wins or more and 6 or fewer losses. Statistically, the 7-7 wrestler should have a slightly below even chance, since the 8-6 wrestler is slightly better. However, the 7-7 wrestler actually wins around 80% of the time. Based on these data and other investigations, the authors concluded that the “safe” wrestlers let the ones at risk win. Their work illustrates how shared cultural values overrode individual competitive incentives in this sport which combines religious and material rewards. In a less dramatic but similar study with respect to finding relationships based on unexpected and unlikely correlations, which I describe in my book, I found that although middle school students had widely varying opinions toward various academic subjects compared to the teacher’s expectations, the teachers always underestimated the student’s fear of failure which they tended to hide, or mask, from the teacher. Also, throughout my career I have learned that my perspectives are sometimes divergent from the mainstream, which is probably one reason why I got into the study of motivation!

Another strong influence in the directions my life has taken and the interconnections among these various directions and episodes can be explained by a liberal, if not metaphorical, use of chaos theory which postulates that extremely small changes in the initial conditions in a system can dramatically change the long-term behavior of the system. Furthermore, these unpredictable outcomes are due in part to the interconnectedness of the elements of a system. This has been referred to as “the butterfly effect” which postulates that actions as seemingly insignificant as the flights of butterflies in China can ultimately be related to weather patterns in North America (Gleick 1987). We also saw examples of this belief in the metaphysics of the inhabitants of Pandora in the movie “Avatar” which portrayed the interconnectedness of people and nature.

When considering the complexity of most systems, especially those that permeate the events during one’s lifetime, it is not surprising that it is difficult to predict exactly how a current event will affect one’s future directions. These effects can be reduced by having clearly defined goals, and some people are very good at this. But for some of us it is almost impossible to do so because we are embarking on pathways which can lead to unknown outcomes. Certainly, when beginning a doctoral program, for example, one can expect that with effort and persistence the end result will be an earned doctorate. But, this foreseeable outcome is relatively minor compared to all of the unknowns about the actual directions one’s life will take while pursuing the doctorate and subsequent to earning it.

Yet, when one reflects on one’s life experiences it can be possible to see many connections that were real but unknown at the time. The whole concept of connections is intriguing and was explored in detail in a famous TV series called “Connections, An Alternative View of Change.” This program and the theory that propelled it rejected the conventional linear and teleological view of historical progress. James Burke, the scientist who was the originator of the series contends that one cannot consider the development of any particular component of the modern

world in isolation from other parts. Rather, the overall patterns of events that occur are the result of networks of interconnected events, even when the networks are not apparent. Thus, there were many inventors who contributed to the discoveries in electricity and aviation and this progress was influenced by other seemingly unrelated cultural events and discoveries.

## **My quest**

How, you might wonder, does this relate to reflections on my life and career and my attitudes toward them? It used to bother me that I did not have sharply defined goals when I was younger, and I don't have them now as I enter retirement. In the past I considered this to be a weakness. But now, I have learned that it is healthy for many of us to live with various degrees of uncertainty as we explore challenges and ideas without knowing for sure where they will lead. In fact, this is how things occurred in much of my life. As I progressed through the various events that I have selected from my life and will briefly describe, I had no sense of their leading in an organized manner toward the achievement of a predefined goal. Within the frame of reference of my life, I moved forward into uncharted territory at each of its stages. For example, no one in my family had gone to graduate school, earned a Ph.D., or entered a professional life. Thus, I had no guidance from within my family and I did not have a mentor outside my family to advise me. Each of the events that I have selected can be considered as a specific episode among a collection of episodes that did prove to be interconnected. In many parts of my life I had very general, abstract goals, but my focus was primarily on process, on moving forward and letting the goal become more well-defined as I progressed. For example, when I first began a conscious effort to discover whether I could create a meaningful, workable synthesis of motivational concepts, no one else had done it and some of my colleagues tried to discourage me. They thought it would be a waste of time. But, I could not abandon that desire. It was something that I truly wanted to attempt, and as can be seen in my subsequent work, it was worthwhile.

Following several brief summaries of some of the key events in my life, I will return to a reflective discussion of how these events illustrate my overall philosophy as illustrated in the preceding comments. And, I will explain how all of this relates to my view of ISD which is also an integral part of my overall philosophy.

### **Developing complex cognitive skills (school, Boy Scouts, small businesses as in bicycle shop, fireworks stand, soda business)**

During elementary and middle school I had several entrepreneurial experiences that helped prepare me for professional activities later in life. My father had a proclivity for helping to establish me in a small business and then leaving it to me to manage it. Actually, he left me too much on my own, but I must say that I learned many valuable lessons. These businesses included a soda stand at the tennis court across the street from my house when I was 11 years old. Two of the lessons that I learned from this experience were that when you have a business, you have to be there! Your freedom to roam around the neighborhood or to play tennis with your best buddy is curtailed. The second lesson was that if you drink too many sodas, which I did, you will have no profits. This was an early lesson in the concept of return on investment

which is one of the important business decisions to be made in front end analysis in the ISD process. Later, after moving to another small town in Oklahoma, my dad and another father helped my friend and I set up a fireworks stand in our front yard as the American Independence Day holiday approach. This was exciting and also rewarding in that we made a little money and had many fireworks that we could explode for our own entertainment. A final example occurred during this same time while I was in junior high school. I set up a bicycle sales and repair shop in our garage and it taught me many things about inventory control, mechanics, and salesmanship. Later, I would use this knowledge and skill while working as a business management trainee at the J. C. Penny Company while attending college, when designing and teaching a managing instructional development course, and in many of my consulting projects in business and industry.

### **U.S. Marine Corps**

Another episode of my life that contributed training and experience related to my ultimate career focus was provided by the U.S. Marine Corps. After finishing secondary school, I joined the marines. This was after the war in Korea and before the one in Viet Nam. My specialty was in the area of flight training and I worked on flight simulators. That job required training in electronics, trouble shooting, maintenance, and instruction. The flight simulator crew was responsible for all maintenance on the simulator as well as instructing pilots on navigational and emergency procedures. Little did I realize how this knowledge of computers, both analog and early digital circuits, knowledge of other training devices, and experience in conducting training would become incorporated in my work as a teacher and professor.

### **Baccalaureate Studies & Early Teaching Experience**

I began my undergraduate studies with a focus on a business major, but I soon switched to philosophy. I found the liberal arts to be much more fulfilling with respect to intellectual challenges and exploring important life questions. I supplemented my philosophy major with a focus on literature and both of these topics contributed greatly to the development of my skills in inquiry, my love of exploring people's motivations and belief systems throughout history, and the pleasure of meaningful intellectual challenges. One of the exciting things about the Riverside campus of the University of California was that even though it was part of a large university system, this campus was deliberately designed to be small with a heavy focus on the undergraduate program. I had many small classes of 10 to 18 students with famous professors. One of them, Philip Wheelwright, used a class management tactic that greatly impressed me and it foreshadowed a technique that was developed by one of my graduate students and that I adopted and adapted in much of my research and that of other students.

In a small class on metaphysics which had approximately 8 students, Dr. Wheelwright would send us post cards from time to time that had specific information and guidance relative to the class. These were not ordinary postcards. They were from his large collection that he gathered in his world travels. For example, one contained a picture of a famous courtyard in Florence, Italy, with classical statues and the spires of famous buildings in the background. The message simply stated that "Books may be open at the final examination." In this day of email, twitter, and other instant communications it might be difficult for you to appreciate the thrill of receiving one of

these postcards from a famous professor depicting an exotic scene and providing a personal bit of useful information that was both informative and motivating. Knowing that we could have open books relieved a lot of stress! In later years, Jan Visser (Visser and Keller 1990) developed a strategy called “motivational messages,” which has many of the same motivational effects and can be used systematically to support student motivation.

In retrospect, it is easy to see how my shift of major from business to humanities combined with the courses I took and experiences such as the one with Professor Wheelwright provided a foundation for my later interest in and research on human motivation, but at the time my primary concern in life was to obtain meaningful work. I had been on my own financially since I was 18 years old with my parents able to do little more than provide a bedroom for me; thus, to become financially secure was a strong motivation! However, I had discarded the idea of a career in business and so I decided to become a teacher. For six years I taught high school in Riverside and then San Diego, California.

As a teacher, I had many experiences that contributed to my future development. Concurrently with teaching at a San Diego school, I took courses in psychology at San Diego State University. At the high school, I taught World Literature, American Literature, Science Fiction, Psychology, and Multimedia. I also sponsored a poetry club and had the pleasure of working with many creative young people. And, one of the more interesting projects that I did was to obtain an innovation grant and engage my classes in film making. I wanted them to learn that even though each medium has unique properties, there are basic principles of communication that apply in all mediums. This project combined systematic planning and design with creativity and it was amazing to see some of the short films that the students produced.

While teaching, I was trying to develop a direction for the next stage of my life. Even though I was having highly successful experiences as a teacher, I knew that this was not what I wanted to do for my entire career. I also knew that I did not want to have a professional career in philosophy or English. When I reflected on the things that were most interesting to me in my previous work, I realized that what I really enjoyed was learning more about human experiences. I was not interested in the technical, analytical side of philosophy represented by the logical positivists and studies of symbolic logic and, with respect to English, I was not interested in studies of linguistics or doing critiques of other people’s works. I wanted to be in a field where I could do research and make original contributions to knowledge. Thus, I decided that my main interest was human behavior and I decided to study it directly by doing a bachelor’s equivalency course of study in psychology and then going to graduate school. Notice that my interests in media and technology did not enter into this decision. I didn’t even consider this issue due to its seeming lack of relevance. I viewed those interests more in the nature of hobbies than areas of professional work.

However, my plans had an abrupt change of direction. As I mentioned previously, I had an impromptu conversation with a fellow teacher who, after listening to me talk about all my varied interests, suggested that I look into educational technology, as most universities called it, or Instructional Systems Technology, which was what Indiana University called it. I immediately began to do research on this field and applied to several universities. I received a wonderful fellowship from Indiana and moved there to do my doctoral studies. I was excited by

the fact that in this relatively new professional field I could combine all of my varied interests in  
human behavior,  
media – multimedia,  
teaching,  
inquiry,  
technology, and  
practice (making things)!

Furthermore, it seemed that it would provide an opportunity for me to be “on the edge” of a field of inquiry and make original contributions. Also, because it was a relatively small field, I expected that it would provide many opportunities for social networking.

### **Doctoral study at Indiana**

The program of study at Indiana was very rigorous with strong requirements in the development of foundational knowledge in educational philosophy as well as quantitative inquiry skills. Yet, within the Instructional Systems Technology program, we had a great deal of flexibility to build a personalized course of study that reflected our interests. My focus of study was in the recently developed curriculum on instructional development, in contrast to the curriculums on media and technology and management of instructional development. In addition, I did minors in Research and Evaluation and in Organizational Behavior. This program of study was even more exhilarating because of the numerous famous professors in each area of focus.

While at Indiana, I did studies and formal research that provided the foundation for the work that would later grow into the ARCS model. I did two studies on the concept of locus of control that were published in prestigious journals (Keller and Pugh 1976; Keller, Goldman et al. 1978), and my doctoral dissertation was on the concept of learned helplessness. This study was a perfect example of combining my interests in intellectual questions with technology applications (Keller 1975). My experiment required the construction of a complex apparatus that contained two response stations. At the first station, the subjects would receive helpless training. They would be presented with an obnoxious noise and a small box with a push button on it. They would try to stop the noise by pushing the button, but there was nothing they could do. At the second station, there was a more complex apparatus. At this station, they could stop the noise if they did enough trial and error explorations with the apparatus. But, because of the previous helplessness training, most of them gave up before discovering the solution.

One of the things that excited me about designing and creating this study was that I had to develop logical circuitry with timers and a variety of logical interfaces to manage the entire process and collect accurate data about performance. Today, this would be done rather simply once the logic of the process were defined, but I was working with small plug-in elements, switches, timers, recorders, and display units. Basically, it was necessary to design the binary logic, select individual electrical components for each function in the logical diagram and then wire them together. It was time consuming but immensely satisfying when it was constructed and the trouble shooting was finished. This task build upon the electronics training I had received in the Marine Corps and it foreshadowed much of the work I have done in my career. Even though computer technology has not been the primary focus of my specialization,

computers have figured heavily in my work, and I taught a computer applications course when I first joined the faculty at Florida State University.

### **ARCS development at Syracuse University**

All of this background information brings me to the point where I joined the faculty at Syracuse University where, within a fairly short time, I began the program of research that resulted in the ARCS model. After being there for a year or two, another serendipitous event led me to an awareness of a huge gap in the instructional design literature with regard to learner motivation. As a result of this, and as I have documented in several writings (Keller 1979; Keller 1983), I first endeavored to build a synthesis of motivational concepts by clustering them based on shared attributes. This resulted in the four component model that became known as the ARCS model (Keller 1984). The other part of the model was a systematic design process that existed in rudimentary form while I was still at Syracuse but became more formalized after I moved to Florida State University (Keller 1987; Keller 1999).

During the past 20 years, people all over the world have become aware of the ARCS model, an observation that can be easily confirmed via Google. They are applying it directly to lesson design, presentation development, and curriculum development in K-12 institutions, higher education, and adult learning settings. However, as I mentioned in my introductory comments, there have been especially strong influences from Japan and South Korea.

### **Early contributions in Japan**

When I arrived at Florida State University, I met Katsuaki Suzuki who was a doctoral student at the time. He was incorporating the ARCS model in his dissertation and in 1988 we published a book chapter on applying the ARCS model to courseware design (Keller and Suzuki 1988). My first visit to Japan was in 1991 where I did one or two presentations, and then, during my second trip to Japan in 1992, I presented an invited address at the 20th Annual Faculty Seminar, College of Liberal Arts, Tohoku Gakuin University, Sendai (Keller 1992). I was the first foreigner to present this annual address. During this trip, I also made presentations at the International Christian University (ICU) and the Tokyo Institute of Technology. In subsequent years, I made numerous trips to Japan, either as a “destination” trip or as a supplement to a trip to other Asian countries. In addition to the numerous presentations that I did, Professor Suzuki and I collaborated on several presentations and publications.

One of my more significant trips to Japan was in 1995 to attend the final conference of a national demonstration project on computers in education at the First Junior High School in Sendai. Professor Suzuki had invented a simplified approach to motivational design that he used with the teachers in the project during the previous year or two (Suzuki and Keller 1996). It was an honor for me to meet the teachers, listen to their presentations, visit their classrooms, and see displays of their work. In addition, a group of Suzuki’s students from Tohoku Gakuin University had prepared a special room called “The Keller Room.” It contained a self guided tour of the various phases of the ARCS model and included interactive games and exercises to teach ARCS fundamentals to the participants. Each participant received a “passport” upon entering the room and had their passports stamped at each of the four A-R-C-S stations if they completed the

exercises. At end of the “journey,” they received an attractive origami cup filled with pieces of candy if their passports had all four stamps! This, even until today, remains as one of the most creative elaborations and demonstrations of ARCS principles that I have ever seen. Furthermore, Suzuki’s simplified approach to motivational design has been modified, adapted, and applied in numerous studies (Visser 1998; Song and Keller 2001). It is now one of the standard tools that can be used in support of motivational design. Furthermore, with respect to my relationship with the ARCS model and Japan, I recently expanded the ARCS model to include concepts of volition and I introduced the new theory and model at this conference in 2004. Since then, I have presented it several times and published a paper describing it (Keller 2008).

### **Interactions with South Korea**

At Florida State University, there was a long history of interactions with South Korea. There were many doctoral students in residence in Tallahassee and, historically, virtually all of them worked with Professor Robert Morgan as their major professor because his projects provided their financial support. The first person to break with this tradition was Sang Ho Song who asked me to be his major professor. He completed his program and is, as many of you know, now a professor at Andong University. We published a paper based on his dissertation (Song 1998) and also wrote a book on the ARCS model that was published in Korea in 1999. Parts of the work that I did for that book have provided the foundation for parts of the motivational design book that I published last December which is a comprehensive presentation of the theory, concepts, design process, tools, and emerging motivational design research trends with respect to the ARCS model (Keller 2010). Including Dr. Song, I have been the major professor for 12 doctoral students from South Korea and all but two of them have graduated. One left the program before finishing and is a very successful business woman in the USA and the other one is still in process. I will continue to work with her until she finishes. I have also been on the doctoral committees of at least 10 Korean doctoral students. Almost all, if not all, of my Korean graduates are working as professors in Korea and the USA and it was a pleasure to see many of them when I travelled to Korea in 1999. During that trip, I did a keynote presentation at the KSET meeting at Ewha University, presentations for Samsung, LG, and Seoul National University in Seoul, and also travelled to Andong to do a presentation at Dr. Song’s university. While there, we had an exciting visit to Hahoe where I had some fun social interactions, which consisted of sharing shoji and snacks with Korean vacationers! Since that time, I have had the good fortune to collaborate with others of my Korean advisees and publish studies reflecting current trends in ARCS-based research (Kim and Keller 2008).

### **Other International Connections**

One of the gratifying parts of my career has been the interactions I have had with people in many parts of the world and each of these has contributed to the overall development of the ARCS model and helped make it successful as a cross-cultural theory and design process. In addition to the extensive involvement with Japan and Korea, these interactions have included a fellowship at the University of Twente in the Netherlands, teaching a summer course at Salzburg University in Austria, working on an Open University Project in Indonesia, conducting presentations and a workshop in Turkey, introducing the ARCS model to a major school district and government research institute in China, serving as an external assessor in Malaysia,

conducting a presentation and consultation in Cuba, and advising doctoral students in North Ireland, Brazil, and the Netherlands. Additionally, I have had opportunities to work with many different private and public sector organizations with regard to general processes of instructional system design and applications of the ARCS model. The U.S. Coast Guard, for example, has adopted the model in many of their training processes and doctrines. All of these experiences have helped to add validity and diverse examples in the development of the ARCS model.

### **Summary of my feelings**

I have described these personal experiences because I believe they illustrate what have been my primary professional goals. One of the reasons I chose this field over psychology was because I wanted to make contributions to practice as well as to knowledge. I wanted opportunities to work with serious and dedicated students, which I could have achieved in many different areas of professional focus, but instructional systems design offered a clear opportunity to be engaged in hands-on work as well as conceptual knowledge development. And because of the international affiliations of educational media programs with most of the major universities in this country, the opportunity to develop a social network of colleagues and friends around the world seemed very possible. It is very gratifying to experience the positive outcomes of my career work thanks to my initial dedication to finding and working on an area of meaningful development within this field, the contributions of graduate students and colleagues, and the contributions of people all over the world whom I do not even know.

However, these outcomes were not without obstacles, setbacks, and even failures. In my motivation seminar, I used to talk about the critical importance of audience analysis and the dire results that can occur when you do not have adequate or accurate knowledge about your audience. Thanks to some disastrous workshop experiences, I learned a great deal about how to implement the design process as well as how to open a workshop in a manner that engages the audience and helps them develop a sense of personal relevance. Also, with regard to the theoretical and conceptual side of my work, I have learned a great deal from the severe criticisms that were levied against some of my manuscripts. When this happens, it can be a severe blow to one's ego, but the only thing to do is to learn from the experience and persist in your efforts to do better next time. The bottom line for me is that I am extremely happy that I entered this field and I have had the fortunate opportunity to work with such talented students and colleagues throughout my career.

### **What do I think about the future?**

With respect to the future of this field, it is difficult to predict what will happen next. When I entered the field there was still a feeling of pioneer spirit and excitement because the field was still relatively new. Now, the field is more mature and faces challenges and threats from other academic disciplines as well as from some of the professors within our own discipline. A few years ago, some professors in our field pronounced that ISD is dead. This occurred at the time of the introduction of constructivist psychology into our field. When I read these criticisms from well-known professors, I could not believe what I was seeing. They demonstrated a total

misunderstanding of what ISD actually is. They were equating ISD with the application of behavioral principles of reinforcement to the design of instruction. It is true that much of the early instructional development work was in the development of programmed instruction and other areas of application that incorporated behavior reinforcement principles. This was reinforced by the emphasis on behavioral objectives. But, this was not ISD. This was a focus on applying behavioral reinforcement principles to the design of instruction. ISD, as I said in my introduction, is the use of systems theory as a means of describing phenomena in terms of their components, inputs, processes, and outputs combined with the use of systematic problem solving methods to identify gaps, goals, solutions, and results. ISD is not grounded in behavioral reinforcement theory or any other learning theory. In fact, the relationship is the opposite. ISD helps you determine what learning goals are appropriate and to then determine what types of learning environments will help you achieve those goals. The incorporation of a given learning theory is a means not an end; that is, the learning theories provide means, or ways of creating instructional and learning environments that enable and support learners.

The sad thing is that I believe this fundamental principle is not always well understood, even by people within our own profession. However, I fervently believe that it is critical to understand this principle if our field is to survive. There are challenges to our field such as those posed by the radical constructivist advocates who view constructivism as the only appropriate way to design learning environments, from other academic disciplines that have emerged such as instructional science and more recently learning science, and the mode of inquiry called design based research which is what we have always done within our profession. Thus, I encourage you to be well versed in the fundamental principles of our field and to advocate them in your professional work. I know of no other professional field that adopts a systematic and holistic approach to understanding learning environments by incorporating general systems theory and incorporates holistic design processes that account for the many interacting variables in a learning setting. Recently, it has become increasingly popular to talk about inquiry methods that are based on the multiple interacting elements in a given environment, which means that there is a growing recognition of the value of the design based research processes that we have always used. This represents a movement away from controlled studies in which everything is presumably held constant except for one or two variables of interest or tightly controlled path analysis studies. This type of research is valuable, but it is not the same as working in action research settings to create models and methods that will be operational and where it is impossible to hold all but one or two variables constant. These approaches require flexibility and modifications to one's methods during the course of a study. Thus, I hope to see a resurgence of dedication and excitement with regard to what our field has contributed to knowledge about learning environment design and to the continued pursuit of higher levels of knowledge and sophistication!

## **In conclusion**

Finally, I want to make a brief comment about what I consider to be one of the primary insights I have gained from my life and professional experience. There is a saying that if you don't know where you are going, any road will get you there. This proverb is in the tradition of rational planning which postulates that you should always have clearly defined goals. It is very

ends-oriented. I take issue with this. The opposite of this perspective is not to be without goals, but to focus on process as well as goals, especially when it is not possible to pre-determine exactly where your path will take you. I believe that the most important thing is in the choosing of appropriate paths. If you are able to identify a specific and concrete goal, it is much easier to choose an appropriate path. But, sometimes, as in my case, I did not know where each new phase of my life would take me, but I certainly knew when I was on a pathway that was taking me forward in an exciting and usually fruitful way. And then, as my interests and the possibilities became clearer, my goals became clearer. In retrospect, I can see evidence of the “butterfly effect,” as it is called in chaos theory, that helps explain the interconnectedness among the events of my life even when there were no apparent connections at many of the moments when these events were occurring. There is no doubt in my mind that being reflective as well as proactive, persistent, and accepting of the help of others are habits that will help you maximize your satisfaction with your career and your life!

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