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Exploring Motivation: Integrating the ARCS Model with Instruction

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Abstract
Purpose - This paper provides an overview of Keller's ARCS Model of Motivational Design and explores how three instruction librarians at different institutions have integrated the model into their teaching practices to improve student motivation during information literacy (IL) sessions.
Design/methodology/approach - Case studies describe how instruction librarians began to incorporate the ARCS Model into library instruction. In order to assess the model, the authors used a range of methods including surveys, interviews with students and librarians, and observation to understand how ARCS can improve student motivation.
Findings - ARCS is valuable for improving student engagement during information literacy instruction. It works well alongside principles and techniques of instructional design.
Originality/value - This paper fills a gap in literature on practical applications of motivational design in library instruction and suggests best practices for teaching and assessment using the ARCS Model.
Keywords (up to 12)- library instruction, motivational design, ARCS Model, Library Instruction West 2016, information literacy, student engagement, teaching methods, assessment
Paper type Case study

Introduction
Instruction librarians are acutely aware that participants in today's knowledge economy must be information resilient and adapt and retool for a changing multimodal landscape (Head, 2012; Head et al., 2013; Lloyd, 2013; Mackey and Jacobson, 2014). As information literacy (IL) instructors we hope to prepare our students to be lifelong learners. Yet many library and information science practitioners and scholars have noted challenges engaging college students in IL instruction (Cahoy and Schroeder, 2012; Jacobson and Xu, 2004; Klentzin, 2010; Latham and Gross, 2013). These challenges persist despite the importance and value placed on IL skills by the Higher Learning Commission, American Association of Colleges and Universities, various accrediting bodies, and a proliferation of professional standards.

Recently, Hess's (2015) article on the use of motivation in library instruction called attention to a gap in the literature. Theories of motivation and the use of motivational strategies during instruction may be the missing link for librarians teaching IL to more effectively engage their learners by appealing to the affective, as well as cognitive, domains (Cahoy and Schroeder, 2012; Klentzin, 2010). This paper will showcase an innovative instructional method for motivating students to have a successful learning experience during IL instruction. The method, known as the ARCS Model of Motivational Design, was developed and described by educational psychologist John Keller (Keller, 1987; Keller, 2010). ARCS stands for Attention, Relevance, Confidence and Satisfaction, four components students need to be engaged in new material.

At present, very little literature explores how librarians can learn about motivational strategies for instruction and begin employing these strategies in their IL sessions. The authors recognized this gap during their independent research, which subsequently inspired two ARCS-related presentations at Library Instruction West 2016. At the conference they connected with the third author, who had recently completed a master's thesis on motivation in library instruction. Challenged by keynote speaker Donna Lanclos (2016) to show the "seams" of scholarship, the authors decided to share their experiences learning about and incorporating ARCS into their library instruction. The case studies in this paper explore the use of Keller's motivational strategies in teaching and assessment practices of three instruction librarians at different institutions, referred to as Librarians J, K, and L in the case studies. The paper suggests best practices for instructors interested in exploring the ARCS Model in their teaching and makes recommendations for future research in the use of motivational strategies.

Literature review

What is motivation?

Psychologists have defined motivation in several ways as different schools of psychological theories have gained prominence and evolved (Schunk et al., 2014). The most current theories that frame motivation focus on cognitive, emotional, and affective aspects of behavior (Keller, 2010, p. 4). The following definition is useful for educators because instruction is typically goal-oriented and instructors expect students to engage in behaviors (activities) that result in learning: motivation is "the process whereby goal-directed activity is initiated and sustained" (Schunk et al., 2014, p. 5). It is important to note that motivation and learning are correlated, but a state of motivation does not guarantee learning will occur. Motivation is multifaceted and dynamic and is impacted by one's physical and psychological needs, previous experiences, and environmental variables (Schunk et al., 2014). Librarians certainly cannot control all of these factors through their instruction, but through careful planning they can create learning opportunities that leverage educational psychology to improve student motivation to learn IL.

Many educators are probably familiar with the terms extrinsic and intrinsic motivation. Those students who are extrinsically motivated pursue a task for a reward (e.g. a high score or recognition), not because they enjoy the task itself (Keller, 2010, p. 17). When extrinsic motivators are used, learners might feel a diminished sense of control and can experience a decreased sense of satisfaction in learning (Keller, 1984). In contrast, Keller (2010, p. 17) states, "individuals with intrinsic motivation engage in tasks for the pleasure that comes from them". Instruction that helps build intrinsic motivation is vital because students who are intrinsically motivated tend to seek challenges, participate actively in class, and are focused on learning rather than an external goal (Jacobson and Xu, 2004). In her study of freshmen attitudes about research, Klentzin (2010) found that students were generally not intrinsically motivated to do academic research, but they valued conducting research when a topic had a personal connection. Extrinsic strategies should not be neglected in an environment focused on grades and achievement, but librarians who use strategies to build intrinsic motivation in their sessions

increase the odds students will develop more positive attitudes toward research and lasting interest in developing those skills.

Keller's ARCS Model
Keller (2010, p. 44) asserted attention, relevance, confidence, and satisfaction are the major dimensions of learning motivation. The four motivational components relate to specific psychological foundations or theories prominent in the field of educational psychology, such as curiosity (attention), the expectancy value theory (confidence and relevance), and reinforcement with rewards (satisfaction) (Keller, 2010, p. 5-6). Research has demonstrated the validity of the model as a whole (Keller, 2010, p. 46).

Keller (2010, p. 24) advocated for motivational design to occur alongside instructional design. He described in detail how to assess a group's motivation, plan intervention strategies, and evaluate their effectiveness. Keller (2010) provided extensive descriptions of the ARCS components and their related psychological constructs, corresponding examples of instructional strategies, and checklists to guide planning and evaluation processes. The Motivational Delivery Checklist, developed by Keller and Armstrong, helps instructors plan for and evaluate the motivational aspects of instruction (Keller, 2010, p. 292). The authors of this paper refer readers to Keller's (2010) *Motivational Design for Learning and Performance* for in-depth descriptions of the ARCS subcategories and assessment instruments.

ARCS Model applied to library instruction
Few librarians have written about motivation related to learning information literacy. Small and her colleagues identified more than fifty motivational theories that relate to learning (Librarian K, 2015). A review of library literature revealed only a handful of those theories have been applied to library instruction, and Keller's ARCS Model has been applied most frequently (Librarian K, 2015). Small et al. (2004) observed community college librarians' classroom instruction using ARCS to classify motivational strategies. They found, out of the four components, attention strategies comprised more than half of all motivational strategies used. Librarians used relevance and confidence strategies about equally (24% and 20%, respectively), and only 4% of strategies fit into the satisfaction category (Small et al., 2004). Student engagement during a session seemed to be correlated with librarians using strategies from multiple ARCS components, rather than with the overall number of strategies used (Small et al., 2004). This latter finding suggests librarians should incorporate a range of strategies, but not overemphasize any particular component, in order to maximize motivation.

Jacobson and Xu (2004) wrote a book, *Motivating Students in Information Literacy Classes*, and also used Keller's ARCS Model to recommend pedagogies, primarily in credit-bearing term-length IL classes, to increase engagement. More recently, Chang and Chen (2015) analyzed the impact of ARCS instructional strategies and materials in three blended (with online and in-class components) IL courses. Generally, students found the course designs were motivational, and they thought materials were valuable academically and in a broader life context (Chang and Chen, 2015, p. 138). However, the researchers did not have a control group

for comparison. Amanda Hess (2015, p. 56) advocated instruction librarians use motivational models, such as ARCS, to "create the most meaningful and effective learning environments". She also noted the dearth of research on best practices for incorporating motivational strategies in IL instruction (Hess, 2015, p. 44). The authors of this paper address that gap through the following case studies.

Case studies

Next, each of the three authors will present a case study of her work with the ARCS Model. Librarian J will talk about design and assessment, Librarian K will discuss her master's thesis work and highlight how she uses ARCS to disrupt computer demonstrations, and finally, Librarian L will detail her application of ARCS with respect to adult learners.

Librarian J case study

J is a librarian at a medium-sized liberal arts institution in the Pacific Northwest. She has been an enthusiastic collaborator with classroom faculty for a number of years, and has taught numerous course-integrated library instruction sessions. Professors have come to expect that whether casually discussing their classes or formally requesting an instruction session, J will extend an invitation to meet over coffee. The collaborative effort involves several back-and-forth instances in which goals are discussed, topics suggested and researched, adjustments made, and instruction sessions scheduled. J has found that this process fosters a sense of partnership (what can we do together?), not merely a sense of service (what can I do for you?), and produces a sense of motivation in the faculty member even before students attend the instruction session.

Several years ago, J found herself at the point of wanting to examine and re-invigorate her instruction techniques; a need that will come to almost every librarian at some point. At the suggestion of a former LIS faculty member, she began to investigate and then apply the ARCS Model of Motivational Design. This model resonated with J because it is based on pedagogical research. Keller formulated the ARCS Model around expectancy-value theory, which presumes that individuals are motivated to learn if there is value in the knowledge presented, and if there is an optimistic expectation of success (Keller, 2010, p. 7).

The application of Keller's Model provides scaffolding for each session by allowing the instructor to move through the model's four steps, to the ultimate goal of student satisfaction. Each of the ARCS elements of: A – attention, R – relevance, C – confidence, S – satisfaction has several instructional methods from which to choose, and this has allowed J to make choices compatible with her teaching style. Surveys of students and faculty show that high levels of student motivation result from these sessions, along with excellent output from student research. For now, J has found that the ARCS techniques most useful in her instruction sessions are the following:

· **Attention** – *Humor* – J always starts with a joke, and she has memorized a long list of these for use at a moment's notice.

·   **Relevance** – *Motive Matching* – After telling a joke, J assures students that she and their professor have collaborated on their class assignment, and that she will now teach them about tools leading to successful research for that assignment.

·   **Confidence** – *Success Opportunities* – The main part of the session is composed of J's demonstration of a tool or tools, then an easy hands-on exercise done by students and librarian together, and finally a focused exercise performed individually by each student on his/her research topic.

·   **Satisfaction** – *Research Takeaway* – At the session's end, J has each student choose the best research result and check it out (book), print it (article), or email it to him/herself (citation, link, other).

In addition, throughout an instruction session, J provides extrinsic rewards by having students report promising results to the class, while affirming their efforts and abilities.

Assessment

J has found Keller's Course Interest Survey (CIS) to be most applicable to her typically 50-minute sessions. The 34 questions on the CIS are fairly evenly linked to the four ARCS elements, and J selects from the four categories to formulate short surveys that she can administer at the end of each session. Each question is answered on a five-point Likert scale, with 5 being the top score (5 = Very true, 4 = Mostly true, 3 = Moderately true, 2 = Slightly true, 1 = Not true). Examples of CIS questions are:

·   **Attention** – The variety of examples, exercise, and illustrations helped keep my attention during this session.

·   **Relevance** – The content of this session conveys the impression that the information is worth knowing.

·   **Confidence** – After working on these exercises for a while, I was confident that I would be able to successfully complete them.

·   **Satisfaction** – It felt good to successfully complete the exercises during the session.

For one case in point, J collaborated with a faculty member to provide instruction in several sections of an introductory composition course. On the CIS administered at the end of each of three instruction sessions, students were asked four questions related to attention, four to relevance, four to confidence, and four related to satisfaction. J was pleased that a tally of survey results showed an overwhelmingly high percentage of fives (very true) and fours (mostly true.) When graphed and separated into the ARCS components (Figure 1) the results are even more striking. Of particular note is the extremely high confidence level reported by these introductory writing students, and the extent to which they found the content relevant to their research needs.

Figure 1. Student responses to ARCS elements of instruction

With practice, it becomes easy to map general qualitative comments to the ARCS Model for assessment purposes, as well. When J hears a student say, "Thanks for helping me in my time

of need!" she knows that the ARCS element of relevance has been achieved. A comment like, "Now I have a much better understanding of how to move around the library's resources!" points to the ARCS element of confidence, while "Thanks for helping me focus my topic and ignite a book-loving passion – I borrowed 15 books already!" clearly demonstrates satisfaction. Finally, it is always good to satisfy one's faculty collaborators, and J draws inspiration to continue applying the ARCS Model when she receives comments like these from faculty:

· "One of the great benefits of incorporating this discussion and assignment into my course was the stronger final papers that resulted."

· "I thoroughly appreciated your willingness to talk to my class on how to do library research – several students came up to me excited about new searches they had conducted."

· "I was very impressed with the presentation – even I learned new information about library resources and how to access them!"

Collaboration with faculty

As a result of longstanding collaborative successes, J was pleased when she shared her new-found knowledge of the ARCS Model with one of her frequent faculty collaborators and found instant support. First, the professor conducted a pre-session survey to provide an audience analysis for J, and then allotted three sessions for library instruction. She made time for a Keller survey of the ARCS components after each session, and then followed up with a post-survey to assess the knowledge gained. J was delighted to hear the professor say, "The fact that the majority of my students felt they could confidently replicate this process on their own makes me very happy!" and it is worth noting that this professor has returned each of the following semesters for a similar partnership.

Librarian K case study

At a liberal arts institution with approximately 1,200 on-campus students, Librarian K observed wide variation in undergraduate students' interest levels and engagement during one-shot library instruction sessions over several years of teaching. One-shot sessions are the primary mode of formal information literacy instruction at the university, which does not offer a credit bearing IL course. Instead, librarians work with faculty to embed IL instruction within course research projects. Librarian K's desire to understand and improve student motivation blossomed into a Master of Education thesis project. She reviewed various theories of motivation, especially those applied to library instruction settings, and discovered Keller's (1987) ARCS Model had been applied most frequently.

Thesis research

To understand whether librarians in higher education consider motivational factors in their IL course design and use motivating instruction strategies, K interviewed five instruction librarians in City X in the fall of 2015. She also surveyed students who participated in her spring 2015 library sessions to determine whether they were motivated to learn research skills and to discover whether they preferred pedagogies that other researchers have suggested are motivating. Based

on these findings, K has integrated several instructional strategies that map to the four ARCS components and plans to add more in the near future.

In order to identify different themes related to motivation and the ARCS Model, K coded interviews with five librarians who discussed instruction sessions where they perceived students were generally either motivated or unmotivated to learn. None of the librarians explicitly used theories of motivation to plan their instruction, but they were very aware of and selected strategies to improve student engagement, which is indicative of motivation. For example, librarians mentioned giving students hands-on experiences and using small group activities to keep students on task. One librarian talked about designing a game based on a popular television program to increase student interest. All of the librarians mentioned demonstrating a research tool using a computer, but some expressed reluctance using this technique because it is so frequently used. Small et al. (2004, p. 110) observed that many student off-task behaviors happened when librarians repeatedly searched the web. Because K spent a significant amount of time demonstrating using a computer, she was particularly interested in finding alternatives to this activity.

Attention and relevance
Before discovering the ARCS Model, Librarian K had already been using attention strategies, such as beginning a session with a brief quiz, sharing a comic, or changing vocal tone and volume throughout a session. Because of her comfort with these techniques, she desired to focus on increasing session relevance and students' confidence and satisfaction.

More than 85% of students Librarian K surveyed on the day library instruction occurred responded they were motivated to learn research skills. Their reasons were primarily extrinsic in nature, such as to complete an assignment, improve writing skills, general academic achievement, and utility in a chosen career. Librarians should make explicit how the session connects with these values. Of utmost importance is tying session goals with the students' specific research assignment. Librarian K always includes goals that allow students to make progress on their assignment, such as developing a search strategy or finding articles. Interviewed librarians mentioned linking instruction to a course assignment is critically important in planning their sessions as well. At the beginning of class K always lists and reviews session goals with students. One tip learned from a librarian she interviewed is to ask students whether there is anything they would like to add to the session. This is an easily implemented strategy to secure buy-in and build rapport with them.

Confidence
The confidence component can be problematic to plan for because students may believe, due to their facility using search engines to find information, that their research abilities are stronger than in actuality. Gustavson and Nall (2011) noted also that students who had individual instruction with a librarian (e.g. a reference interaction) in a K-12 or college setting tended to be overconfident in library research abilities. Forty-seven percent of students surveyed as part of

K's research reported feeling confident they could complete their research assignment and almost 19% felt very confident before IL instruction took place.

How can librarians employ confidence strategies in a way that corrects overconfidence? K frequently begins a session with a short quiz on concepts that will be addressed during the session to help students recognize gaps in their knowledge and gain attention. Alternatively, she has asked students to write down a question they have about research and submit it anonymously, a method which Hanz and Lange (2013) have also used successfully to help instructors understand students' library knowledge and to tailor a session to make it more relevant to students. This opportunity to reflect may also help students recognize they do have questions about research and there is more to learn. The Committee on Undergraduate Science Education suggested guided active learning exercises that expose students' misunderstandings and then help them develop a new schema could combat overconfidence (as cited in Gustavson and Nall, 2011). Librarian K plans to develop such exercises in the future.

Key to helping students build confidence which is grounded in their actual abilities is an accurate understanding of their skills and knowledge upon entering a session. To overcome the problem of not knowing students' knowledge before arriving to a one-shot, one librarian K interviewed used a pre-session survey that asked students to rate their confidence level using various tools and services. This allowed the librarian to tailor the session content to the needs of students—to make it more relevant and help students increase their comfort level using those research resources.

Satisfaction

Like Librarian J, K builds student satisfaction by ensuring students walk out of the classroom with sources for their research assignment or some other concrete evidence they have made progress. This can be as simple as having students bookmark search tools they can return to later. K has also discovered that giving students time at the end of a session to reflect on what they learned is not only helpful for reviewing concepts but can instill positive feelings. Giving students the opportunity to provide feedback on the session makes students feel valued. K often asks, either formally through an online survey or informally by talking with students, what they liked about the session or thought was most helpful to them. She has learned that allowing students adequate time to work independently is important; overloading content into a session at the expense of work time may lessen student satisfaction. Another way to capture students' intrinsic motivation and build satisfaction is to give students choices when completing activities. One simple strategy revealed by one of K's interviewees, and that she has since adopted, is to present students with three choices for using their time when they have time to complete work in class. A future goal is to develop and provide students with specific measureable criteria by which they can evaluate their learning or progress at the end of a session.

A session incorporating ARCS strategies

Librarian K had observed that individual classes vary in their apparent levels of motivation. They differ based on the characteristics of individual students, social dynamics, and relationships with

the professor. Thus, the diagnostic piece of Keller's ARCS Model was appealing. Knowing the characteristics of the audience is important in order to plan effective motivational strategies. In preparation for IL sessions, K typically asks faculty whether students seem generally motivated and about the social dynamics within the class. In combination with the session goals, she considers each of the ARCS components when selecting instructional strategies and aims for a balance among the different components.

To give students autonomy, help them build confidence, and avoid librarian-centered demonstrations using a computer, K devised activities that she has used with junior nursing students. Students were asked to work in pairs to meet their needs for social interaction (to increase relevance related to learning styles) and to lessen potential fear of embarrassment in front of peers. Instead of the librarian showing students what resources are available on a course research guide, K asked students to write two questions that could be answered using information found on the guide (attention, inquiry arousal). Instead of demonstrating the use of CINAHL and PubMed, K asked half of the class to examine one database and the other half examined the other database (confidence, success opportunities). Students determined the primary users, content, and whether the resource was subscription. To tie in with students' career goals, K asked which database would be freely available to them after college (relevance, goal orientation). She asked students to find whether "high blood pressure" is a subject term used in each database and discover possible alternative terms (confidence, success opportunities). This led to a brief discussion about subjects versus keywords. After each activity, students were asked to share their findings with the entire class (satisfaction, extrinsic rewards). As a way to increase satisfaction, at the end of class K used an online survey and asked students to respond to the question, "What behaviors will you adopt (beginning today!) to ensure you incorporate evidence based practices?" The high response rate (97%) and action-oriented responses suggest students felt they learned something valuable they will be able to apply. Students participated, shared their discoveries freely during the full class discussions, and asked each other and the librarian questions. One student approached K after the session to tell her the information shared was immediately applicable and useful.

Librarian L case study
Discovering ARCS
Librarian L discovered ARCS through literature searching when teaching one-shot information literacy sessions at a large urban community college as an MLIS graduate student. Students were busy adults, and L knew that coursework was only one component of lives that often included full-time jobs, children, and family responsibilities. Some students seemed to have a clear purpose for pursuing their degrees. Other students seemed tired and harder to engage during library instruction. L wondered what she could do to encourage these students to participate in research sessions. She realized that the demonstrations and lectures she had started with were perhaps not the most appropriate way to engage adults, who come with their own life experiences and prior knowledge. Even in the short time frame of the one-shots, L was interested

in trying to draw on students' life experiences and interests to help motivate them during library instruction.

Through keyword searches on intrinsic motivation and learning, L came across Keller's ARCS Model. She felt that Keller's work offered practical solutions that could be applied to IL teaching. She particularly liked that ARCS provides a way of conceptualizing the necessary components for adult students to be connected to the material and learning experience. In the four years since, she has experimented with using ARCS in her teaching in different ways at a suburban community college and a large research university.

Incorporating ARCS
Attention and relevance

For attention and relevance at the beginning of a session, using storytelling can help orient the class and engage students in the day's topic from the start. After hearing a presentation on storytelling in teaching by John Watts and Joshua Vossler at the LOEX 2015 conference, L developed four stories. She chooses one of the four to use at the beginning of one-shot classes based on the goals and subject matter of the class. As the LOEX presentation advised, L practiced fleshing out the stories' sensory details, the dramatic moments, and the pacing. She makes clear each story's connection to the IL skills the class covers that day and to show how these skills could be transferred to life outside of class. While L does not use the stories for every class, she finds that when stories are used they set the tone for the rest of the session. As a transition and opening, she finds stories to be very effective in readying the group for hands-on activities and pulling students away from their cell phones or other distractions. Especially when librarians are guest lecturers, stories can help build a common connection with students, opening the door to greater participation and engagement.

Confidence

Keller (2010, p. 162) noted immediate corrective feedback is key to building student confidence. Like many library instructors, L tries to take time to walk around the room, making sure to visit each student, understand their topic and the strategies they are using to find information, and make suggestions. She has learned not to ask "Do you have any questions?," which often yields silence, but instead to ask, "What is your topic? What have you tried so far? What would you like to see instead of the results you're getting now? What strategies could you try to change the results?" This approach can contribute to student satisfaction, as students find that their successes are coming from their own efforts to troubleshoot (Keller, 2010, p. 176). If a class is large, L might ask students to work together in groups. In this way, she can still speak to each group and give feedback and suggestions.

Since much of L's teaching has been with adults, she also recognizes the importance of giving learners choices about how they work as a key component of confidence (Keller, 2010, p. 162). She tries to build in options for students to work alone or together. For group work L sometimes suggests that groups leave the classroom and find space to work elsewhere in the

building. Often she will suggest several possible options for completing an activity, and leave the choice to students to select how they work best.

Satisfaction

To increase relevance and build satisfaction in the learning experience, L tries to invite students to share their own experiences in every session, whether they share a research experience they have had in a previous class, or a personal experience that relates to or contradicts the information found during the session. Recognizing that students are the experts of their own lives and valuing that expertise has been a valuable way of building rapport in sessions and has opened the door to interesting conversations on authority, dissemination of information, and the economics of information.

 To help increase students' intrinsic satisfaction in the learning experience, Librarian L often includes a wrap-up question at the end of a session to the effect of, "Which of these strategies will you take home and use in other areas of your life?" Sometimes L poses this question for open discussion, or captures it in a minute paper, or as part of a more formal end-of-session assessment. The goal of asking this or similar questions is to encourage students to reflect on the learning experience they've just completed and to connect it both to what they are learning in their course and also to their work and personal lives outside of the class. Through this self-reflective element, students are more likely to transfer their learning to other contexts and find support for greater metacognitive awareness (Billing, 2007, p. 488; Perkins and Salomon, 1988, p. 23).

Lessons learned

L has learned to be careful not to overuse motivational strategies. As Keller points out, students can actually become disengaged if strategies are overused or if they are already highly motivated when they come into the class (2010, p. 62). For one-shots, it can be difficult to gauge students' motivation levels when they enter. By standing near the door and greeting students as they arrive, L tries to get a sense of how likely they are to participate and what their interest-level might be.

 Sometimes, L reviews Keller's Motivational Delivery Checklist when she is planning a session to think about which strategies she wants to use and when during the class she wants to employ them. She appreciates that the checklist has a wide variety of strategies grouped for the beginning, middle, and end of a class. She is able to select and experiment with strategies that feel most authentic for her as an instructor. L jots down notes after each session in a teaching journal to keep track of what worked and what didn't over time.

 Using the ARCS framework has given L a strategic sense of *why* she chooses to use motivational techniques, keeping her grounded in the overall goals of the instruction and being mindful of how these techniques contribute to a student's engagement and motivation. She also appreciates that there is much to explore with the ARCS Model of Motivational Design. While L has primarily been dipping into Keller's book and assessments as needed for help and inspiration, she feels that there is much valuable content for planning, teaching, and assessing--it

seems possible to keep experimenting with the model indefinitely. In the coming semester, L plans to explore setting specific motivational objectives along with learning objectives to help match students' motivation and interest levels with the flow of in-class activities.

Assessing using ARCS

In 2013, L conducted a series of workshops which incorporated ARCS into the pre-test and post-test to gauge students' perceived confidence levels and whether they found the material to be relevant to their interests and needs. L used questions 6, 16, and 33 from Keller's Instructional Materials Motivation Survey (p. 283) and question 5 from the Course Interest Survey (p. 279) to assess relevance (Librarian L, 2017). She was interested in using ARCS to help benchmark where students saw themselves before and after the workshop. The workshop did have statistically significant improvement in students' perceptions of their confidence. There were also strong indicators that students found the material relevant to their lives and goals.

Discussion

The case studies of Librarians J, L, and K show remarkable overlap, given the authors live in three different states and only recently met one another. This is a nod to Keller's ARCS Model of Motivational Design and its universal appeal. Yet the case studies also show notable points of contrast, which can be attributed to the model's customizable nature. Librarian J has found success with traditional undergraduates and first-year composition students. Librarian K has worked closely with nursing students who are gaining a specific set of research skills, and Librarian L has applied her techniques to adult learners with a wide range of motivational levels. With a common goal of fostering motivation in students, all three authors have been enthusiastic about discovering the model and the success that has resulted at each of their institutions.

There are many instances of overlap in ARCS strategies mentioned in this paper. Librarians J and L both gained students' attention with stories; J's are in the form of jokes, and L uses lengthier storytelling to build common connections. K and J noted the critical importance of tying session goals to course assignments to demonstrate relevance. Both K and L mentioned the importance of giving students choices about how they work or what they wish to share with the class, to build confidence. Librarians J and K make sure students leave the classroom with takeaways that give them a start on their research assignment, which provides satisfaction. As the reader might suspect, many of the strategies satisfy more than one ARCS category. This is to be considered a good thing, because the flow of any instruction session will seem natural while a motivational structure is maintained.

Table 1 aligns the four categories of attention, relevance, confidence, and satisfaction with selected ARCS sub-categories, matching them to library instruction strategies the authors have used and described in the case studies. Selecting among these strategies may be helpful to librarians seeking to incorporate the ARCS Model into their teaching.

Table 1. ARCS instructional strategies

Best practices
Based on their experiences, the authors have derived a set of best practices for integrating the ARCS Model into any librarian's instructional practices. These practices include:

1.   Try to get to know the motivational characteristics of your audience.

Librarians L and K mentioned the need to analyze one's audience, to determine the motivational characteristics of students in a given class. L discussed her work with adult learners, noting the wide range of motivational states from clear purpose to fatigue. K polled faculty ahead of time to gauge the class social dynamic and levels of motivation, and resorted to Keller's principle of treating similar audiences in similar fashion, when needed.

2.   Start slowly, trying one or two new strategies at a time, rather than taking a whole new approach. This makes it easier to avoid overusing strategies.

3.   Feel free to customize, since each ARCS element offers several different application strategies; integrate the elements you feel resonate best or are most comfortable with at first. While J is comfortable telling jokes, many people are not; some may be more comfortable using K's technique for gaining attention by showing a cartoon. If controlling large group active learning activities is an issue, use small-group interactions.

4.   Develop and implement a way to gather feedback from students on changes one is making.

J and L used Keller's (2010) surveys, and K and L posed reflective questions. These can be used to examine if one's changes are effective or need to be modified.

Conclusion

Engaging college students in information literacy sessions is important to help them develop a positive attitude toward lifelong learning and learn research skills to meet their own needs and employers' expectations. Head (2012) noted that graduates must use a variety of research skills to be successful solving problems at work, and that relying on their online search skills is insufficient. Today's college students often juggle multiple responsibilities, such as jobs and families, and may believe they are proficient at research because they are accustomed to using search engines to find quick answers to information problems. Previous research (Gibbons, 2007; Messineo and DeOllos, 2005; Serotkin, 2005, as cited in Becker, 2012, p. 487; Librarian K, 2015) has shown that students value learning research skills; however, the authors' classroom experiences indicate there is wide variation in student engagement in library instruction sessions. It is clear that students who are motivated engage in learning by showing interest, making effort, and persisting when they encounter challenges (Schunk et al., 2014). Attitudes translate into

actions, and students with motivation to learn IL skills will probably be more successful doing so and are more likely to retain information beyond a class session.

For instruction librarians who wish to add motivational elements to their teaching, Keller's (2010) ARCS Model is valuable. The authors have each found their own ways of incorporating ARCS in their teaching, and have observed positive impacts on student engagement. The authors encourage instruction librarians to experiment with the model, and the strategies listed in Table 1 are offered as a starting point. The model allows librarians to customize their instruction to meet the unique needs of particular groups of students.

Research in other disciplines and in online settings has demonstrated ARCS-designed instruction is motivational. Additional research is needed to provide stronger evidence that ARCS is effective in face-to-face library instruction settings. Studies that use an experimental design, where student on- and off-task behaviors are observed in classes designed using ARCS strategies and then compared with non-ARCS designed classes, would provide more robust evidence. Small et al.'s (2004) study, which examined student behaviors during instruction, could provide a guide for how to conduct such a project. Also, more research is needed to understand whether using ARCS motivational design in IL sessions translates into improved student learning and better performance on research assignments. Thus, there are several areas librarians might investigate to improve the profession's understanding of students' motivation in developing their information literacy.

References

Billing, D. (2007), "Teaching for transfer of core/key skills in higher education: cognitive skills", *Higher Education*, Vol. 53, pp. 483–516.

Cahoy, E.S. and Schroeder, R. (2012), "Embedding affective learning outcomes in library instruction", *Communications in Information Literacy*, Vol. 6 No. 1, pp. 73–90.

Chang, N. and Chen, H. (2015), "A motivational analysis of the ARCS model for information literacy courses in a blended learning environment", *Libri: International Journal of Libraries & Information Services*, Vol. 65 No. 2, pp. 129–42.

Gustavson, A. and Nall, H.C. (2011), "Freshman overconfidence and library research skills: a troubling relationship?" *College & Undergraduate Libraries*, Vol. 18 No. 4, pp. 291–306.

Hanz, K. and Lange, J. (2013), "Using student questions to direct information literacy workshops", *Reference Services Review*, Vol. 41 No. 3, pp. 532-546.

Head, A.J. (2012), "Learning curve: how college graduates solve information problems once they join the workplace", available at: http://projectinfolit.org/images/pdfs/pil_fall2012_workplacestudy_fullreport_revised.pdf

Head, A.J., Van Hoeck, M., Eschler, J. and Fullerton, S. (2013), "What information competencies matter in today's workplace?" *Library and Information Research*, Vol. 37 No. 114, pp. 74–104.

Hess, A.N. (2015), "Motivational design in information literacy instruction", *Communications in Information Literacy*, Vol. 9 No. 1, pp. 44–59.

Jacobson, T.E. and Xu, L. (2004), *Motivating Students in Information Literacy Classes*, Neal-Schuman Publishers, Inc., New York, NY.

K, L. (2015), [Thesis on motivation]

Keller, J.M. (1984), "The ARCS model of motivation in teacher training", in Shaw, K. and Trott, A.J. (Eds.), *Aspects of Educational Technology Volume XVII: Staff Development and Career Updating*, Kogan Page, London, pp. 141-145.

Keller, J.M. (1987), "The systematic process of motivational design", *Performance & Instruction*, Vol. 26 No. 9/10, pp. 1-8.

Keller, J.M. (2010), *Motivational Design for Learning and Performance*, Springer, New York, NY.

Klentzin, J.C. (2010), "The borderland of value: examining student attitudes towards secondary research", *Reference Services Review*, Vol. 38 No. 4, pp. 557–570.

L, L. (2017), [in press]

Lanclos, D. (2016), "Teaching, learning, and vulnerability in digital places: Library Instruction West 2016 keynote", presented at Library Instruction West, Salt Lake City, UT, June 9.

Latham, D. and Gross, M. (2013), "Instructional preferences of first-year college students with below-proficient information literacy skills: a focus group study", *College & Research Libraries*, Vol. 74 No. 5, pp. 430–449.

Lloyd, A. (2013), "Building information resilient workers: the critical ground of workplace information literacy. What have we learnt?" in *Worldwide Commonalities and Challenges in Information Literacy Research and Practice European Conference in Istanbul, Turkey, October 22-25, 2013*, Springer International Publishing, Berlin, pp. 219–228.

Mackey, T.P. and Jacobson, T.E. (2014), *Metaliteracy: Reinventing Information Literacy to Empower Learners*, Neal-Schuman Publishers, Inc., Chicago, IL.

Perkins, D.N. and Salomon, G. (1988), "Teaching for transfer", *Educational Leadership*, Vol. 46 No. 1, pp. 22–32.

Schunk, D.H., Meece, J.L. and Pintrich, P.R. (2014), *Motivation in Education: Theory, Research, and Applications* (4th ed.), Pearson Education, Inc., Boston, MA.

Small, R.V, Zakaria, N. and El-Figuigui, H. (2004), "Motivational aspects of information literacy skills instruction in community college libraries", *College & Research Libraries*, Vol. 65 No. 2, pp. 96-121.

Watts, J. and Vossler, J. (2015), "Hacking the framework: using the art and science of story to address the dispositions", presented at LOEX 2015, Denver, CO, May 1.