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Exploring motivation: Integrating the ARCS model with instruction

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Exploring Motivation: Integrating the ARCS Model with Instruction

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 sessions.

Design/methodology/approach - Case studies describe how instruction librarians began to incorporate the ARCS Model into library instruction. Three librarians used self-reflective practice and a range of assessment techniques to evaluate and improve teaching practice.

Findings - ARCS is valuable for improving student engagement during information literacy instruction. The authors suggest best practices for learning about and integrating the model and propose instructional strategies that align with it.

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). Yet many library and information

science practitioners and scholars have noted challenges engaging college students in information literacy (IL) instruction (Cahoy and Schroeder, 2012; Jacobson and Xu, 2004; Klentzin, 2010; Latham and Gross, 2013). Recently, Hess's (2015) article on motivation in library instruction called attention to a gap in the literature. Motivation and its impact on learning has been addressed extensively in the field of education, but few researchers have identified effective motivational strategies for library instruction (Hess, 2015). 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 affective, as well as cognitive domains (Cahoy and Schroeder, 2012; Klentzin, 2010).

At present, very little literature explores how librarians can learn about motivational strategies for instruction and begin employing these strategies in their IL sessions. This paper highlights the ARCS Model of Motivational Design, a method for motivating students to have successful learning experiences during IL instruction. The ARCS Model was developed by educational psychologist John Keller in the 1980s (Keller, 1987; Keller, 2010). ARCS stands for Attention, Relevance, Confidence and Satisfaction, four components students need to be engaged in new material. ARCS is broken down into subcomponents and process questions, listed in Table 1. Keller recognized that through effective instructional design instructors have significant impact over whether students desire to learn (Keller, 2010). He mapped specific pedagogies to each of the four components so instructors might diagnose where their instruction lacked motivational elements and incorporate strategies to account for any deficits.

Table 1. Keller's (2010) ARCS subcomponents and process questions

During their independent research, the authors recognized that few papers address library instruction and motivational strategies, 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. 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 by our last names in the case studies. The authors' goal is to communicate how three teaching librarians have approached and integrated motivational design into instruction. These case studies are intended to be qualitative and self-reflective, rather than relying on quantitative methods to show evidence for the effectiveness of ARCS. 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 various 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 in instruction, 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). Intrinsic motivation can be stimulated by incorporating challenge, curiosity, learner control, and fantasy in activities (Schunk et al., 2014), and research has shown intrinsic motivation stimulates deep learning (Jacobson and Xu, 2004). Rather than existing on one continuum, it is more accurate to think of levels of intrinsic and extrinsic motivation on separate continuums (Schunk et al., 2014). Students may have high or low levels of both simultaneously, and levels are context-specific (Schunk et al., 2014). Both intrinsic and extrinsic motivation are important in the learning process. 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. Despite their potential drawbacks, extrinsic strategies should not be neglected in an environment focused on grades and achievement. In fact, most library instructors would probably agree it is essential to connect instruction with academic

achievement and students' research assignments in order to demonstrate relevance. However, librarians who use both intrinsic and extrinsic strategies in their sessions appeal to a range of learners and increase the odds students will develop more positive attitudes toward research and lasting interest in developing those skills.

Keller's ARCS Model

Because motivation is such a complex blend of students' cognitive and affective states and environmental variables, McMillan and Forsyth (1991) posited, "No one theory or perspective can be applied to every situation. Each one is insufficient by itself, and thus many theories must be considered simultaneously, in order to take action that will increase students' involvement in learning" (p. 40). In the 1970s Keller recognized the limitations of using just one motivational construct to inform instructional design and endeavored to create a more robust guide for educators (Keller, 2010). His model, grounded in social learning theory and humanist psychology (Jacobson and Xu, 2004), is based on a systems approach that integrates multiple theories. Keller is considered a "pioneer in the field of motivation design," and the model has had a significant impact in the field of computer-based instruction (McMahon, 2014, p. 52). ARCS is one of the most popular models used by educational technologists and is grouped with Robert Gagne's nine events of instruction and D.H. Jonassen's problem-based learning approach as a foundational component for online learning (Carliner et al., 2008). A Google Scholar search revealed Keller's (1987) paper describing the model has been cited in more than 1500 works; a search on Keller and ARCS in the ERIC database yielded more than 60 works that discuss the model.

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 those strategies' 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. In particular, 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 model may be applied to instructor behavior, instructional materials, and lesson design (Keller, 2010). Keller and other researchers have established the model's effectiveness at increasing student motivation (Keller, 2010, p. 46; McMahon, 2014). 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 IL. A review of library literature revealed only a handful of theories have been applied to library instruction, and of those, Keller's ARCS Model has been applied frequently (Chang and Chen, 2015; Gross et al., 2012; Hess, 2015; Jacobson and Xu, 2004; Small et al., 2004). Small and her colleagues applied the model to IL instruction in K-8 settings (Moyer and Small, 2001; Small and Arnone, 2000), and she and Arnone developed the Motivation Overlay for Information Skills Instruction, partially based on ARCS, for use by school library media specialists (Moyer and Small, 2001). In higher education, 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's (2004) book, *Motivating Students in Information Literacy Classes*, also used Keller's ARCS Model to recommend pedagogies to increase engagement, primarily in credit-bearing term-length IL classes. More recently, Chang and Chen (2015) analyzed the impact of ARCS instructional strategies and materials in three blended IL courses (with online and in-class components). Generally, students found the course designs were motivational; 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 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 three case studies.

Integrating new teaching strategies into practice

Reading literature, attending lecture-style professional development or conferences are found to have limited long-term effectiveness for implementing new teaching strategies (Stewart, 2014). Yet, for librarians, much of the professional development happens in isolation using those strategies (Wheeler and McKinney, 2015). Finding institutional and financial support for large-scale professional development work, such as professional learning communities or coaching groups, can appear out of reach. Given the often solo nature of librarians' professional learning, how can librarians effectively improve their teaching practices?

Reflective teaching and writing for library instructors can serve as a framework for individuals to improve their teaching (Booth, 2011; Grant, 2007; Larrivee, 2000). Larrivee (2000) advocated for critical reflection to combine both self-reflection and critical perspectives that encompass our identities, ethics, and deeply held beliefs. She wrote, “[i]f teachers latch onto techniques without examination of what kinds of teaching practices would be congruent with their beliefs, aligned with their designated teaching structures, and harmonious with their personal styles, they will have just a bag of tricks” (Larrivee, 2000, p. 294). While talking and thinking about teaching can be a vulnerable process for many, involving questioning long-held beliefs or practices and uncertainty around embracing new strategies (Larrivee, 2000), these reflective practices are especially relevant as we work to strengthen our classroom practices.

Case studies

The authors of this article, who have a shared interest in using the ARCS Model, decided to engage in reflective writing regarding our teaching practices. The authors offer these case studies of librarians at different career stages and institutions as we have learned about, experimented, and assessed the ARCS Model and begun adapting new instructional strategies and techniques. The authors hope these experiences will encourage others to integrate motivational strategies into instruction and reflect on and discuss these experiences with colleagues. Hauck talks about assessment and faculty partnerships, Reynolds discusses her master’s thesis work and highlights how she uses ARCS to disrupt computer demonstrations, and Roberts uses ARCS with nontraditional students to integrate their life experiences and future goals.

Hauck case study

Hauck 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, Hauck will extend an invitation to meet over coffee. The collaboration involves several exchanges in which goals are discussed, topics suggested and researched, adjustments made, and instruction sessions scheduled. Hauck 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, Hauck felt the need to examine and re-invigorate her instruction techniques, a feeling 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 Hauck because it is based on pedagogical research. Keller formulated the ARCS Model around the 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 Hauck 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, Hauck has found that the ARCS techniques most useful in her instruction sessions are the following:

- **Attention** – *Perceptual Arousal* – Hauck always starts with humor in the form of a joke, and she has memorized a long list of these for use at a moment's notice. Students feel an intrinsic sense of curiosity as they anticipate what's next.
- **Relevance** – *Goal Orientation* – After telling a joke, Hauck assures students that their professor and she have collaborated on their class assignment, and that she will now teach them about tools leading to successful research for that assignment, which connects to students' extrinsic motivation to begin their research.
- **Confidence** – *Success Opportunities* – The main part of the session is composed of Hauck'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. After practicing their research skills for several minutes, students are invited to report promising results to the class (extrinsic rewards), and Hauck invokes an intrinsic sense of pride by affirming their efforts.
- **Satisfaction** – *Extrinsic Rewards* – At the session's end, Hauck 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). Students depart from the session with a tangible extrinsic reward in the form of their findings.

Assessment

Hauck 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 Hauck 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 (5 = Very true, 4 = Mostly true, 3 = Moderately true, 2 = Slightly true, 1 = Not true). Examples of

CIS questions follow:

- **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, Hauck 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. A tally of 172 survey responses 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. Course interest survey results

With practice, it becomes easy to map general qualitative comments to the ARCS Model for assessment purposes, as well. When Hauck 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 Hauck 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, Hauck 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 Hauck 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. Following is the professor’s brief pre/post-survey of her 18 students:

- On a scale of 1-5, how confident are you with finding the following types of sources in the library on your own? (1=I have no idea how to find this; 5=I would easily be able to find this)
 - Subject encyclopedia article

- Book by a credible author
- Anthology or edited book
- Scholarly journal article using an online index
- Newspaper/magazine article using an online index
- On a scale of 1-5, how satisfied are you with your academic research skills and abilities?
(1=I am not at all satisfied; 5=I am very satisfied)
- What skills do you hope to learn/have you learned in these library sessions?

After the professor analyzed the pre-post survey, Hauck was delighted to hear her 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 this professor has returned each of the following semesters for a similar partnership.

Reynolds case study

At a liberal arts institution with approximately 1,200 on-campus students, Reynolds observed wide variation in undergraduate students’ engagement during one-shot library instruction sessions over several years of teaching. One-shot sessions are the primary mode of formal IL 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. Reynolds’ desire to improve student motivation through effective instructional design grew 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 frequently (Chang and Chen, 2015; Gross et al., 2012; Hess, 2015; Jacobson and Xu, 2004;

Small et al., 2004).

Thesis research

To understand whether librarians at other local colleges and universities consider motivational factors in their IL course design and use motivating instructional strategies, Reynolds conducted structured interviews with five librarians with at least ten years teaching experience in City X in the fall of 2015 (Reynolds, 2015). Interview methodology was used so the researcher could learn about librarians' instruction holistically, including their rationales and explanations for their actions and opinions. There is disagreement about ideal sample size in interview research, but five participants is considered adequate for establishing thematic redundancy (Beitin, 2012). Because Reynolds desired to use data collected from the interviews primarily to explore which instructional strategies librarians use to motivate students, a small sample size was appropriate for the purpose. Questions were designed to identify librarians' preferred instruction methods and their rationale for selecting those methods. Reynolds asked interviewees to reflect on a session when students were motivated to learn and to consider factors that might have influenced students' motivation. The full list of questions is found in online Appendix A (<http://libguides.cu-portland.edu/ARCS>). Similar to Small et al.'s (2004) study, Reynolds correlated strategies librarians described with the various ARCS components, listed in online Appendix B (<http://libguides.cu-portland.edu/ARCS>). Results may not be generalized because of the limited number of participants, and non-random convenience sampling was used to select participants. However, themes that emerged from interviews provide insights about what librarians consider to be important when planning instruction.

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 related

to motivation. An analysis of strategies they used indicates overlap with the ARCS Model (see online Appendix B.) 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 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 and suggested that might lower student motivation.

When asked why they preferred specific instructional strategies, librarians gave a variety of responses. Three librarians talked about engaging students, piquing their interest, preventing boredom, or encouraging their participation. Two librarians talked about using techniques to help students feel comfortable, to develop rapport, or to create a safe classroom environment where students felt they could take risks. Two librarians used their preferred techniques to reinforce information, that students learn best by doing and that when learning is tied with emotions, it is more likely to “stick.” Time was also a prominent theme in librarians’ responses. All librarians were cognizant of the time constraints of a one-shot session. Librarians wanted students to make progress on assignments so they would leave feeling satisfied and that their time was well-spent.

When asked whether any of their preferred instruction techniques were used to motivate students, three participants responded affirmatively, and two did not believe so. The librarian who uses facilitated conversation believes it motivates students to learn because it can challenge their beliefs and complicate their thinking. Because that librarian is comfortable using that technique, the librarian can focus on connecting with individual students and building rapport. Similarly, another librarian believes questioning students, making eye contact, and asking

students' names demonstrates a caring attitude. This librarian also believes hands-on practice is motivating and noted that some motivation may come from instruction but it is primarily faculty who motivate students. One librarian uses clickers in a specific discipline where she perceives students are less motivated. Clickers help keep those students engaged. The librarian also noted that when students recommend particular resources to other students, their interest and buy-in seems to increase.

Attention

Before applying ARCS to her instruction, Reynolds had already been using attention strategies that may stimulate students' curiosity and intrinsic motivation, such as beginning a session with a brief quiz, sharing a comic or video that presents a real-world problem, or asking students open-ended questions throughout a session. Because of her experience using these techniques, she desired to focus on increasing relevance and students' confidence and satisfaction.

Relevance

Of utmost importance is tying session goals with students' specific research assignments. At the beginning of class Reynolds lists and reviews session goals and includes goals that allow students to make progress on their assignment, such as developing a search strategy or finding articles (extrinsic motivators). Interviewed librarians mentioned the critical importance of linking instruction to a course assignment as well. 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 students. Another strategy an interviewee revealed, and that Reynolds has since adopted, is to present students with three choices for using their time when they have time to complete work in class. Asking students to

identify their own learning goals and giving them choices about how they complete those goals, such as offering different search tools they can use, may increase intrinsic motivation. Reynolds has also 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 them understand students' library knowledge, tailor a session, and to increase relevance. These strategies allow students some control over content, increasing their intrinsic motivation.

Confidence

Key to helping students build confidence, 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' abilities before a one-shot, one interviewee used a pre-session survey that asked students to rate their confidence level using various tools and services. This allowed the librarian to tailor session content to students' needs—to make it more relevant and help students increase their comfort using those research resources. Challenge is another aspect of intrinsic motivation and confidence-building: one is more likely to initiate behavior toward a goal if it is perceived as moderately challenging (Schunk et al., 2014). One strategy to ensure students feel challenged is to provide differentiated instruction, which gives students diverse options for learning based on their personal learning styles, knowledge, and skills (Lucey, 2015).

Satisfaction

Like Hauck, Reynolds builds satisfaction by ensuring students leave the classroom with sources for their assignment or some other concrete evidence they have progressed (extrinsic rewards). This can be as simple as having students bookmark search tools they can use later. Allowing students adequate time to work independently is important; overloading content into a session at

the expense of work time may lessen satisfaction. Instructors can support students' intrinsic enjoyment of a learning experience by providing positive reinforcement and feedback. Reynolds has learned to praise students for their efforts and make specific comments on students' work rather than an off-hand, "That's great!" Reynolds also discovered that giving students time at the end of a session to reflect on learning is not only helpful for reviewing concepts but can instill positive feelings. Giving students opportunities to provide feedback on sessions makes them feel valued and gives them a sense of control (intrinsic reinforcement). Reynolds 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. Another way to build students' satisfaction is to give them opportunities to share their accomplishments in class with others. Reynolds teaches a session with biology students where students share their learning in a poster/presentation, and student comments about this format have been positive. A future goal is to provide students with specific measurable criteria by which they can evaluate their learning at the end of a session (intrinsic reinforcement and equity).

A session incorporating ARCS strategies

Classes' motivation levels differ based on individual students' characteristics, social dynamics, and relationships with the professor. Thus, the diagnostic piece of Keller's ARCS Model was appealing to Reynolds. Knowing the audience characteristics, such as preferred learning styles and attitudes toward research, is important to plan effective motivational strategies (Keller, 1987). This information might be gathered from students by working with faculty to administer a pre-session survey. In combination with the session goals, Reynolds 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, Reynolds devised activities for 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. Reynolds asked students to write two questions that could be answered using information found on a research guide (attention, curiosity, intrinsic motivation). Instead of demonstrating the use of CINAHL and PubMed, Reynolds asked half of the class to examine one database and the other half examined the other database. Students determined the primary users, content, and whether the resource was subscription (confidence, success opportunities). To tie in with students' career goals, Reynolds asked which database would be freely available 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 (attention, curiosity, intrinsic motivation). After each activity, students were asked to share their findings with the class (satisfaction, extrinsic rewards). As students shared, Reynolds provided feedback about their findings and complimented their research efforts (intrinsic reinforcement). As a way to increase satisfaction (extrinsic rewards), at the end of class Reynolds used an online survey and asked students to respond to, "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 class discussions, and asked each other and the librarian questions.

Roberts case study

Roberts discovered ARCS through literature searching when teaching one-shot IL sessions at a large urban community college as an MLIS graduate student. Choy defined nontraditional students as those who delay enrolling in higher education for a year or more after high school, are part-time students, work 35 hours or more each week, are financially independent of parents, have dependents, are single parents, or completed high school with a GED or other alternative to a high school diploma (2002, p. 2-3). Given this definition, it could be argued that the majority of students now enrolled in higher education meet one or more of these criteria, regardless of age, and students at the institution where Roberts was teaching met many of these criteria. She knew that coursework was only one component of lives that often included full-time jobs 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.

Roberts wondered what she could do to encourage students to participate in research sessions. She realized the demonstrations and lectures she had started with were perhaps not the most appropriate way to engage students, who come with their own life experiences and prior knowledge. Even in the short time frame of a one-shot, Roberts was interested in trying to draw on students' life experiences and interests to help motivate them during library instruction.

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

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 by John Watts and Joshua Vossler at the LOEX 2015 conference, Roberts 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, Roberts practiced fleshing out the stories' sensory details, dramatic moments, and the pacing. She makes clear each story's connection to the IL skills the class covers that day and shows how these skills could be transferred to life outside of class. While Roberts 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 classroom guests, 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, Roberts takes 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, Roberts might ask students to work together in groups. In this way, she can still speak to each group, ask questions, and make recommendations.

Since much of Roberts' teaching has been with nontraditional students, 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 Roberts 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, Roberts invites 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 an effective 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 increase students' satisfaction in the learning experience, Roberts often includes a 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 Roberts 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).

Using the ARCS framework has given Roberts a strategic sense of *why* she chooses to use motivational techniques, keeping her grounded in the overall goals of 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. While Keller presents a comprehensive model for planning, conducting, and evaluating motivational design from start to finish, there are components from the motivational design system that may be used separately to address specific motivational concerns. This author finds it's possible to derive value from experimenting with the individual components of the model in addition to using the full motivational design toolkit. For those beginning to integrate the model into their teaching, experimenting with certain elements of the model is a way to gradually introduce it into practice.

Discussion

The case studies of librarians Hauck, Reynolds, and Roberts show remarkable overlap, given the authors live in different states and only recently met. This is a nod to Keller's ARCS Model of Motivational Design and its broad applicability to varied instructional settings. Yet the case studies also show points of contrast, which can be attributed to the model's customizable nature. Each librarian learned about and experimented with the model in different ways, through interviewing other librarians to glean points of application, piloting the model with a trusted faculty colleague, and focusing on the motivational needs of a specific student group.

Table 2 aligns the four ARCS categories with selected sub-categories, matching them to instructional 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 2. ARCS instructional strategies*Limitations*

Roberts has learned to be careful not to overuse motivational strategies. As Keller cautions, students can 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, Roberts tries to get a sense of how likely they are to participate and what their interest-levels might be. Reynolds typically asks faculty whether students seem generally motivated to learn and about social dynamics within a class. Faculty perceptions are subjective, but their insights have proven to be a helpful part of Reynolds' planning.

The confidence component can also 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 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. How can librarians employ confidence strategies in a way that corrects overconfidence? Reynolds frequently begins a session with a short quiz on concepts that will be addressed during class to help students recognize gaps in their knowledge and gain attention. Based on this information, a librarian can tailor instruction in the moment and over time develop activities with an appropriate level of challenge.

Often, Roberts reviews Keller's Motivational Delivery Checklist when 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 can select and experiment with strategies that feel most authentic for her as an instructor. Roberts takes notes after each session in a teaching journal to chronicle what worked and what didn't over time. Hauck and Roberts have used Keller's (2010) surveys, and Reynolds and Roberts posed reflective questions to gauge effectiveness.

Best practices

Based on their experiences, the authors have derived the following set of best practices for integrating the ARCS Model into instruction:

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

Roberts and Reynolds mentioned the need to analyze one's audience, to determine the motivational characteristics of students in a given class. Roberts discussed her work with nontraditional students, noting the wide range of motivational states from clear purpose to fatigue. Reynolds polled faculty ahead of time to gauge social dynamics 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 elements you feel resonate best or are most comfortable with initially.

While Hauck is comfortable telling jokes, many people are not; some may prefer to use Reynolds' attention-getting technique by showing a cartoon. If controlling large group activities

is an issue, use small-group interactions.

4. Develop and implement a way to gather feedback from students on changes made.

Conclusion

Engaging college students in information literacy sessions is important to help them develop research skills to meet their own needs and employers' expectations. Head (2012) noted 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 has shown that students value learning research skills (Gibbons, 2007; Messineo and DeOllos, 2005; Serotkin, 2005, as cited in Becker, 2012, p. 487); however, the authors' classroom experiences indicate there is wide variation in student engagement in library instruction. It is clear 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 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 2 and online Appendix B 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 compared with non-ARCS designed classes, would provide more robust evidence. Small et al.'s (2004) study, which examined student behaviors during instruction, provides a guide for how to conduct such a project. Also, more research is needed to understand whether using ARCS 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.

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