MOTIVATIONAL DESIGN IN INFORMATION LITERACY INSTRUCTION

Amanda Nichols Hess
Oakland University Libraries

Motivational design theory complements instructional design theory and, when used together, both principles can affect learning, knowledge acquisition, and knowledge retention. In information literacy instruction, motivational design exists throughout the appropriate standards documents. However, there is limited current research on the best practices for using motivation in information literacy or library-based instruction. The existing research does indicate that librarians who deliver information literacy instruction attempt to implement motivational design theories such as Keller's ARCS model into their teaching, although often at a low level. Furthermore, studies of face-to-face and online library learning environments illustrate that using the ARCS model – and, more broadly, considering student motivation – can impact student learning and achievement. In considering how future information literacy instruction can be most effectively designed, expanding research on the meaningful inclusion of motivational design in information literacy instruction could help to shape this discipline's instructional significance, knowledge retention, and learning application.

INTRODUCTION

Understanding the root of motivation and identifying how to engage an individual's intrinsic or extrinsic motivational desires is an important component of instruction. As such, educators and instructors in any setting need to consider structuring learning scenarios so learners are engaged in the knowledge acquisition process, see the relevance of their learning, feel confident that their experience is meaningful and can be applied, and experience satisfaction from the scenario. This can be accomplished by consciously employing instructional design principles that include theories of motivational design.

While motivational design theories can be incorporated in any instructional setting or in conjunction with any subject matter, engaging learners' motivation may be particularly important when addressing inter - or cross-disciplinary concepts. In such scenarios, considering motivational design may help answer the questions, "When will I ever *use* this?" or, "Why do I need to learn this?" One such cross-disciplinary area is information literacy, which can be seen as both an independent discipline in the field of library and information science and an integrated concept across *all* subject matters in which learners demonstrate information-seeking behaviors.

This literature review first considers motivational design as a theory related to instructional design. From there it addresses information literacy instruction as it is represented in the relevant educational standards, and it considers how these standards address motivational design. It then delves into how motivational design

has been used in information literacy instruction to impact learners' knowledge acquisition and achievement. From an analysis of the existing literature, gaps in understanding are identified and future directions for research are suggested. Finally, this review concludes with the implications of motivational design on 21st century information literacy instruction.

INSTRUCTIONAL DESIGN AND MOTIVATION

Instructional design is "the science and art of creating detailed specifications for the development, evaluation, and maintenance of situations which facilitate learning and performance" (Ritchey, Klein & Tracey, 2011, p. 3). While instructional design is an independent discipline with its own theoretical and practical foundations, it is also integrated – intentionally or de facto – into any field in which instruction or learning is a focus. Like information literacy, then, instructional design is interdisciplinary while also independent. Instructional design has its roots in programmed instruction (Skinner, 1954), learning objectives (Bloom, 1956), and evaluation (Scriven, 1967); these ideas have been adapted to meet learners' needs as technology has advanced and provided new vehicles for increasingly constructivist learning interactions.

One of the hallmarks of instructional design as a field is its use of General Systems Theory (GST) in the way it conceptualizes instruction. While GST seeks to define systems that can be broadly applied across diverse scenarios ("General systems theory," 2006), instructional design specifically uses GST effectively to

understand and construct learning experiences. Hall and Fagen (1956) define a system as "a set of objects together with relationships between the objects and between their attributes" (p.18); instructional design models have proliferated with the goal of ensuring consideration of the full learning system. The most famous and frequently used instructional model is ADDIE; through this model, designers **analyze** a given scenario, **design** and **develop** instruction tailored to the situation and learners' needs, **implement** the designed instruction, and **evaluate** the design's effectiveness. This cyclical and iterative process has been modified and adapted to fit a variety of instructional scenarios (see, for instance, Booth, 2011) and is intended to improve the instructional interaction and learners' outcomes.

Motivational Design
Motivational design theories are related to instructional design in that they consider a facet of the learning system: learners' motivation and its impact on the instructional experience. As such, these theories can overlay instructional design principles to ensure learner engagement and perception of instructional value**.** Motivation, as a concept, is thought to influence both an individual's decisions and participation (Vancouver, 2004). It is particularly important in learning and design because influencing an individual's decision to participate in an instructional interaction is essential for learning to occur. Motivation can be divided into two categories: intrinsic, or internal motivation which refers to the personal delight, joy, and interest individuals experience that influence their decisions or levels of participation; and

extrinsic, or external, motivation, which refers to the notion of completing a task or performing a behavior because it leads to a separate, external outcome, such as a reward or avoidance of a punishment (Deci, 2004). Behaviorist learning theories, with their external reinforcement as a key component (see, for instance, Skinner, 1954), explicitly rely on learners' extrinsic motivation while hoping to engage intrinsic motivation as well. At their root, though, many other theories of learning aim to engage learners' intrinsic motivations to acquire new knowledge.

ARCS Theory of Motivational Design
Within the field of instructional design, the most influential motivational design theory is the ARCS Theory of Motivational Design (Keller, 1987). This theoretical framework speaks directly to how instructional designers can craft learning experiences and instructional interactions to engage learners' intrinsic and extrinsic motivations. Keller (2010) defined motivational design for learning as "the process of arranging resources and procedures to bring about changes in people's motivation" (p. 22), and there are three distinct ways to create such designs. First, designers can use a person-centered philosophy that addresses the psychological constructs of interpersonal interactions; second, they may employ an environment-centered philosophy that considers how an environment impacts an individual's responses and interactions; or third, they may focus instruction using an interaction-centered philosophy that considers how human values influence, and are influenced by, their environment. Keller also noted that motivational design models that attempt to incorporate teaching systems can be considered omnibus models.

[ARTICLE]

While Keller (1987) recognized the challenges of motivational design, he also sought to construct a model for how designers can consistently and meaningfully impact learner motivation through instruction in his ARCS model. This structure asks designers and instructors to gain learners' **attention**, demonstrate learning **relevance**, ensure learners are **confident** in their own success, and provide opportunities for learners to experience **satisfaction** from their learning (Keller, 1987). From these four concepts, Keller proposes a systematic process of motivational design to overlay on instructional design models. First, he noted that the designer should obtain information on the course and on the intended audience. Once this information has been identified, the designer should then analyze both the intended audience and existing instructional materials. From this analysis, the designer should list the desired instructional objectives and how these objectives will be assessed; objectives and assessment techniques can help identify potential methods for addressing motivation. At this point, the designer can select desired motivational tactics and determine how to integrate them into instruction. In this integration process, the designer can develop or select any appropriate materials. Once these steps are complete, the designer should evaluate these efforts and revise as necessary (Keller, 2010).

INFORMATION LITERACY INSTRUCTION

Information literacy is interdisciplinary, exists in both the real world and in academe, and can be conceived of in different ways by different disciplines. Because libraries lead the charge in information literacy instruction, librarians are generally responsible for teaching individuals how to find, evaluate, organize, and use that information in meaningful and appropriate ways. As such, the American Association of School Librarians (AASL) and the Association of College and Research Libraries (ACRL) have established standards to ensure instructional focus and quality in information literacy.

A History of Information Literacy Standards

The AASL established the first library standards as early as 1945 with their publication of *School Libraries for Today and Tomorrow*. This provided practitioners benchmarks for differentiating between services offered by a public library and services offered by a school library. Since this guiding document was issued, library instructional standards have seen six additional iterations in 1960, 1969, 1975, 1988, 1998, and 2007. Many of these standards were published in conjunction with either the Department of Audiovisual Instruction (DAVI) of the National Education Association or the Association for Educational Communications and Technology (ACET). These collaborations reflect the interdisciplinary nature of information literacy, particularly as it relates to the use of technology in instruction and to find, understand, and use information.

Following the publication of the AASL and AECT's (1998) *Information Power,* the ACRL (2000) created the *Information Literacy Competency Standards for Higher Education*. This document codified how information literacy instruction should occur at the college and university level and has

[ARTICLE]

five guiding principles. At the higher education level, information literate individuals should be able to: determine their information need; access needed information efficiently and effectively; critically evaluate this information; incorporate and use information in one's knowledge base; and understand and respect ethical and legal concerns for information use and access (ACRL, 2000). Each of these areas maps with performance indicators and assessment outcomes, and for academic librarians, these competencies outline what an information-literate student *looks like* upon successful attainment of a degree or certificate.

In light of the changing information landscape in the 21st century, the AASL offered a revised set of standards, *Standards for the Twenty-First Century Learner*, in 2007. This independent publication represents information literacy learning at the K-12 level as four standards. The first is to inquire, think critically, and gain knowledge. The second is to draw conclusions, make informed decisions, apply knowledge to new situations, and create new knowledge. The third is to share knowledge and participate ethically and productively as members of our democratic society. And the fourth is to and pursue personal growth. These standards are subdivided into skills, dispositions in action, responsibilities, and self-assessment strategies.

In turn, the ACRL has been revisiting what information literacy means in post-secondary educational environments. In part, the need to better align postsecondary standards with the *Standards for the Twenty -First Century Learner* and the goal of

presenting consistent and cohesive information literacy expectations for K-16+ learners drove this revision. However, the new *Framework for Information Literacy for Higher Education* presents a more theoretical and "complex set of core ideas" about information literacy instruction (ACRL, 2015, p. 1). Instead of a prescriptive set of educational objectives, this new guiding document presents six "interconnected core concepts, with flexible options for implementation" (ACRL, 2015, p. 1). These frames – scholarship is a conversation, research as inquiry, authority is contextual and constructed, information creation as a process, searching as exploration, and information has value – provide structure for corresponding sets of knowledge practices and dispositions. This conceptual framework provides librarians and instructors new and more complex ways to consider information literacy in post-secondary education and beyond.

Motivation in Information Literacy Standards

The components of Keller's (1987) ARCS model can be found throughout information literacy standards documents. The AASL standards only explicitly mention motivation once – in a disposition statement, which asserts that learners should "demonstrate motivation by seeking information to answer personal questions and interests" (AASL, 2007, p. 7) – but the ideas of self-efficacy, satisfaction, confidence, and practical relevance weave throughout this document's stated standards and dispositions. Learners are asked to demonstrate "confidence and self-direction," "persistence" and "emotional resilience" (AASL, 2007, p. 4) in searching for information. Furthermore, they are

[ARTICLE]

tasked with applying "knowledge to curricular areas, real-world situations and further investigations" and connecting "understanding to the real world" (AASL, 2007, p. 5) and to "community issues" (AASL, 2007, p. 6). Finally, students need to "create products that apply to authentic, real-world contexts" (AASL, 2007, p. 6). While these standards speak to what *students* must do, the expectation is that school librarians will build instructional interactions that allow for their learners to accomplish these goals.

As in K-12 information literacy instruction, the central ideas of Keller's (1987) motivational design theory exist in the ACRL's (2000) information literacy competency standards and in the new ACRL (2015) information literacy framework. For example, students are tasked with "investigat[ing] benefits and applicability of various investigative methods" (ACRL, 2000, p. 9) and "assess[ing] the… relevance" (ACRL, 2000, p. 10) of the information they find. Information-literate students, as defined by these standards, also "[apply] new and prior information" in the creation of a learning product while organizing the information they find in meaningful and relevant ways for their particular purpose (ACRL, 2000, p. 13). Learners are also asked to "[reflect] on past successes, failures, and alternative strategies" (ACRL, 2000, p. 13), which speaks to Keller's ideas of how learners may see and experience satisfaction in their learning.

Furthermore, the new ACRL (2014) information literacy framework sought to better to represent the "abilities, knowledge, and **motivation** surrounding information

literacy" (emphasis added). In the *Framework*, the committee notes the increasing attention paid to the role of "affect as a driver for critical thinking" (ACRL, 2014, p. 23). As such, there are references to motivation in several of the information literacy frames. For instance ACRL noted that motivation for how information sources are formatted and disseminated may be financially, by reputation, socially, or civically based; whether information is shared is determined in part by these important drivers. Also, in its examination of authority as a constructed and contextual concept, the ACRL framework notes that learners who are developing information literacy in this area must "[m]otivate themselves to find authoritative sources, recognizing that authority may be conferred or manifested in unexpected ways" (p. 4). This illustrates the continued importance of motivation as a component of information literacy instruction, and in individuals' information-seeking behaviors.

MOTIVATIONAL DESIGN IN INFORMATION LITERACY

Jacobson and Xu (2004) broadly considered how motivational design can impact information literacy instruction in their book, Motivating Students in Information Literacy Classes. They asserted that motivational design – specifically Keller's (1987) ARCS model – in information literacy instruction occurs in four teaching formats: course-related instruction, drop-in sessions, first-year experience programs or learning communities, and credit-bearing courses. Enhancing motivational elements in each of these instructional structures takes different forms and has different

[ARTICLE]

limitations; for example, students enrolled in a for-credit course on information literacy may have different levels of intrinsic motivation and desire for success than students asked to participate in first-year experience programs. Jacobson and Xu noted it is important to consider integrating motivational aspects at the initial instructional or course design level, and in the teaching behaviors demonstrated by a librarian; both areas can be impacted by the use of active learning techniques. Through effective design and instruction, the authors noted that students should be able to demonstrate and exhibit autonomy in their learning process, and any assessments that measure student achievement should be authentic in that they ask students "to demonstrate, in a meaningful way, what they know and are able to do" (Montgomery 2002, p. 35, as cited in Jacobson & Xu, 2004, p. 102). By considering these factors, information literacy instruction can effectively address the concerns of student motivation.

Measuring Motivational Design in Instruction

There is a limited body of research that focuses on assessing the use of motivational design in information literacy instruction. In one such instance, Small, Zakaria, and El-Figuigui (2004) sought to identify how motivational design was used in face-to-face information literacy instruction, and considered Keller's (1987) ARCS model, the ACRL information literacy competency standards, and Small and Arnone's (2000) Motivation Overlay for Information Skills Instruction as points of reference. From these guiding documents, the researchers examined how, and which, motivational strategies were used in community college

information literacy programs. To collect information, ten teaching instances were examined at seven different institutions, and data were collected from in-course observations and pre-/post-observation interviews with the teaching librarians.

The researchers found that, while the librarians emphasized the importance of active learning in the classroom – which is one way to demonstrate relevance – the majority of their instruction' focused on finding and accessing information, which fall in the beginning stages of research. As such, the observed lessons were narrow in scope and did not always situate the search process as a component of a broader research process. When aligned with the ARCS model, the data also showed that librarians most frequently used attention-getting strategies by a wide margin – 53 percent, compared to 24 percent of strategies focused on demonstrating relevance, 20 percent focused on confidence-building, and 4 percent focused on ensuring learning satisfaction. Furthermore, the community college librarians focused more on the intrinsic motivating factors of learning rather than on extrinsic motivation (i.e., grades). However, when a random convenience sample of students were surveyed, the researchers found that students perceived the instructional session as interesting and felt very confident in their ability to apply their learning.

For practitioners in a K-12 library setting, there is a dearth of research on effective information literacy teaching methods that incorporate motivational design. Arnone, Small, and Reynolds (2010) specifically noted that there is a lack of instruments available to assess adolescents' perceptions

[ARTICLE]

of their information literacy skills. They asserted that, if such an instrument existed, K-12 school librarians could use it to assess students' motivational levels and then plan instruction accordingly. The researchers developed the Perceived Competence in Information Skills (PCIS) diagnostic instrument to respond to this perceived need; they asserted that both K-12 school and academic librarians could use this tool. The PCIS was honed through a comprehensive process that involved a literature/standards review, expert librarians' review to refine the instrument, pilot testing with a convenience sample of 279 students, and finally a large-scale study with 47 K-12 schools. Based on the data collected from the large-scale study, the PCIS instrument was validated by comparing it to other measures that collected similar data points. Because the PCIS data aligns with other measures' data, the researchers determined this tool should be considered a validated instrument and can be implemented. Arnone, Small, and Reynolds also noted that the PCIS diagnostic instrument could be used both as a planning tool for instruction and designing motivational interventions in information literacy, or as a pre- and post-test survey to assess learners' experiences with motivation in information literacy instruction. In this way, they sought to increase K-12 school librarians' consideration of motivation in their instruction.

Motivational Design in Face-to-Face Instruction

While hard data may be limited on how librarians use motivational design in instruction, there is more information available on case studies and specific instructional programs that attempt to consider the affective components of learning. For instance, Mortimore (2010) discussed how a focused and structured information-seeking process model was implemented at an all-female historically black college in the interest of increasing motivation and addressing learners' affective needs. By using Kuhlthau's (2004) Information Search Process, the researcher and his colleagues sought to impact one-shot library instruction sessions; this model embedded motivation in each of its five phases by considering the cognitive, affective, and physical realms of students as they seek information. The data demonstrate that student achievement increased significantly since the implementation of the Information Search Process structure and that, more broadly, a systematic and consistent approach to teaching the research process to students has "reduced research anxiety" (p. 9).

While Mortimore's (2010) case represents one academic library's undertaking, Melissa Gross and Doug Latham (2013; also as Latham and Gross, 2013; Gross, Latham & Armstrong, 2012) have conducted considerable empirical research on designing effective information literacy instruction to reach college students, especially those who have lower levels of information literacy proficiency. In contrast to Small, Zakaria, and El-Figuigui (2004) and Arnone, Small, and Reynolds (2010), their research focused on *students* rather than on instructors. Throughout the course of a three-year study, Gross, Latham, and Armstrong sought to examine motivation from a holistic perspective.

First, Latham and Gross (2013) assessed community college students' perceptions

about and motivation for information-seeking tasks. Through focus group discussions with 65 students, they measured students' information literacy skills for personal information-seeking needs and imposed information-seeking needs (i.e., a class assignment). From these discussions, the researchers asked students to compare their information literacy skills in each situation, and they also asked students to consider their instructional preferences and motivations to attend information literacy workshops. The researchers found that, in students' personal searches for information, they understood the importance of identifying their need to determine where to search for information; from this need, they identified the importance evaluating information. Generally, students recognized that these skills were also necessary in the academic realm, where they also viewed information-seeking success as a function of cognitive and life management skills. The most significant difference indicated between the two types of information needs, though, was the idea of a self-imposed need and an externally-imposed need. Students preferred to address self-imposed needs and, to that end, they appreciated teaching styles that allowed them to have hands-on practice opportunities. However, the researchers also found that these students needed incentives or extrinsic motivating factors to attend information literacy instruction sessions.

These data present important considerations for librarians and instructional designers as they consider how best to deliver information literacy instruction. Latham and Gross (2013) asserted that students' feedback should impact how librarians and instructional designers create engaging and motivating information literacy instructional

sessions for students. First, students need to have time to practice skills and concepts, either independently or in pairs/small groups. Hands-on practice helps students feel engaged. Also, instructional sessions should be designed so students can engage in self-directed research when possible because this will help impact their motivation to learn and connect the skills they possess for personal research to their academic search process. And, information literacy workshops should be either mandatory or offered with incentives to engage students' extrinsic motivation because depending on learners' intrinsic motivation may not be effective.

Gross, Latham, and Armstrong (2012) also explored student motivation by designing and evaluating instructional interventions for community college students. Specifically, they focused on those students who believed they had above-average information-seeking behaviors but, in actuality, demonstrated below-average information literacy skills. Their data collection process used the validated Information Literacy Test (ILT) produced at James Madison University (Cameron, Wise & Lottridge, 2007) and follow-up structured interviews with a subgroup of participants at two community colleges. Through these methods, the researchers assessed students' proficiencies in the five identified ACRL standards and their perceptions of their own skills. From this data, they designed workshops as interventions, with Keller's (1987) ARCS model and the nine events of instruction (Gagné, Briggs & Wager, 1992) in mind: workshops had small class sizes, allowed for practice time with a partner, involved an interactive teaching style, and made information-seeking relevant to the

[ARTICLE]

students. These workshops focused on three research goals students needed to accomplish: analyze the information need, search for that need using keywords, and evaluate the results in relation to the need.

In the final year of their three-year project, Gross and Latham (2013) assessed the effectiveness of the workshop model. Specifically, they sought to determine if students' perceptions about the necessary research skills and their personal information-seeking abilities had changed, and whether students gained at least one new skill through the workshops so as to improve their information-seeking outcomes. The researchers found that the intervention did impact the skills students thought they needed to find information, and that students recognized they had lacked the necessary skills. They also found that students felt that, through the workshops, they had gained the skills they needed to be effective researchers. However, an analysis of student performance on the Information Literacy Test did not demonstrate significant learning gains post-workshop. The researchers noted that, although the single workshop model boosted participants' understanding of information literacy and increased their own perceptions of their information-seeking skills, it did not make students proficient information seekers. Targeted and focused information literacy instruction that engages students in their learning allows them to interact with their peers, and brings the personal into the process impacted learners' motivation, but as Gross and Latham (2013) posited, this model may not effectively impact actual learning performance. Instead of a one-time workshop, regular, consistent, and mandatory interventions may make more

significant and lasting impacts on students' information literacy proficiencies.

Motivational Design in Online Information Literacy Instruction

In their consideration of motivating students in information literacy instructional situations, Jacobson and Xu (2004) discussed the implications for motivational design in *online* information literacy learning. They noted that many of the motivational techniques that can be used in these environments parallel the strategies for face-to-face classrooms, including using a variety of instructional challenges, engaging students with active learning exercises, and allowing learners to be relatively autonomous. However, the authors also emphasized the importance of recognizing the unique affordances, challenges, and opportunities of online learning environments. In the years since Jacobson and Xu's work, online learning has experienced tremendous change, and it is important to consider what current research illustrates about motivational design in new e-Learning environments.

One study considered how motivational design could be implemented at the course level to teach information literacy skills online. ChanLin (2009) evaluated the effectiveness of a library and information science course through the lens of the ARCS model. Specifically, this study considered four central concerns: motivational problems encountered in a web-based learning process; how the course was adjusted to support students' learning motivation; task engagement and learning exhibited by students as a result of implementing the ARCS model; and, how learners' achievement related to their

[ARTICLE]

involvement in the course. The data demonstrated that the course's design did attempt to engage learners' motivation through tools such as video clips, graphics, and task-oriented assignments. Furthermore, the instructional design of the course attempted to ensure learners were confident in, and satisfied with, learning by giving students agency and asking them to metacognitively reflect on their learning. The researcher also analyzed all textual data from course discussion boards, forums and assignments, and conducted a quantitative analysis by tallying the number of discussion posts per student. From this information, ChanLin determined that there was a positive correlation between students' participation in online discussions and performance on the exam. Furthermore, students expressed positive feelings about the use of the ARCS model, and demonstrated self-efficacy throughout their course experience; however, the extrinsic motivation of academic performance (i.e., grades) may have been a contributing factor.

Although ChanLin's (2009) work focused on an online library and information science course, it has implications for how librarians can address information literacy in online courses. For instance, they can ask students to reflect on their learning through discussion board forums or electronic journal posts; such a structure could be built throughout the information-seeking process (e.g. reflecting on finding, accessing, evaluating, and using information). Also, the extrinsic motivation, which ChanLin noted, may have contributed to performance and perceptions of the ARCS model; this may be something that librarians in both online and face-to-face instruction may consider. Embedding authentic assessment

that carries the weight of grades may engage learners' motivation, and this is feasible at both the K-12 and higher education levels.

While librarians – particularly in higher education – may teach freestanding, credit-bearing courses, information literacy instruction is more often conducted through one-off instruction sessions, both online and in person. It is relevant, then, to consider how motivational design is implemented in online tutorials or lessons. In one such study, Markey, Leeder, and St. Jean (2011) examined college students' behavior playing an information literacy game, BiblioBouts. Their primary consideration was to determine how the gaming environment impacted motivation. Such a format allowed for students to engage in and have direction over their learning: in BiblioBouts, students participated in an online tournament of "bouts," or mini-games, which introduced students to different information literacy skills. During the 2010-2011 academic year, the researchers engaged students in 13 different courses in BiblioBouts, and data were collected from the game logs, students' optional online diaries, and focus group participation.

While Markey, Leeder, and St. Jean (2011) focused their data analysis on several research questions, their inquiry into how students' participation in BiblioBouts could develop best practices for information literacy instruction through games is most significant for this examination of motivation. They found that BiblioBouts was effective in teaching students important information literacy skills, such as resource evaluation and information-seeking as a process. However, students commented that they wanted the experience to be more fun,

[ARTICLE]

and that the addition of more enjoyment and entertaining activities would improve their participation and engagement in the game. Furthermore, the researchers found that some students felt the game was longer than necessary; there were significant numbers of students – 27.8 percent – who either did not engage in the game or dropped out and returned at some point. This fallout rate suggests issues of motivation, and that students *were not* motivated, either intrinsically or extrinsically, to complete the tasks at hand. While the researchers used this feedback to improve BiblioBouts and add more "fun" features, such as badges, personal virtual trophy cases, and a public trophy case to display to the game's other users, students' feedback in this study can help shape and direct online information literacy instruction more broadly. The respondents' comments about fun and engagement speak directly to Keller's (1987) concept of attention-getting, while their issues completing the full game imply issues of satisfaction and relevance. Using this research as a point of information to address learners' concerns in future online learning modules, tutorials, or games can help librarians impact student motivation and engagement in developing information literacy skills.

FUTURE RESEARCH DIRECTIONS

Beyond Jacobson and Xu's (2004) book and the Gross and Latham (2013; Gross et al., 2012; Latham & Gross, 2013) studies, there is a limited amount of meaningful research on motivational design in information literacy instruction. It seems that while librarians and instructional designers believe motivation is important in instructional interactions, it is perhaps assumed as a

given or considered *less* important than addressing various library standards. However, because the existing research is limited, there are several potential directions for future scholarship in motivational design and information literacy instruction.

Motivation and Information Literacy Standards

Since both K-12 and academic libraries have recently revisited their information literacy guidelines, additional research can be conducted as to how to address motivation in light of these changes. In academic libraries, additional research should focus on incorporating motivational design with the new ACRL (2015) *Framework*. As academic librarians begin to design instruction around a new set of standards, scholarship on how to best address learners' motivation – especially that of *adult* learners – in light of these standards would help practitioners in the field. And, in K-12 school libraries, additional research can be conducted on the effectiveness of the PCIS diagnostic tool to effectively identify students' self-efficacy in information literacy; case studies should be conducted to illustrate how school librarians can most effectively use this tool. From such research, teachers and teacher educators can determine how best to include aspects of motivational design models in information literacy instruction.

Online Learning Experiences

As more discipline- and subject-specific instruction moves online, information literacy instruction moves online, as well. It is important, then, to consider assessing how learners can be motivated in online, library-focused instruction. The existing literature on online information literacy instruction is

limited, and it does not consider different permutations of information literacy as an embedded concept *within* online courses or instructional experiences: examples are single skill- or concept-focused tutorials, course-specific learning modules, or librarians "embedded" into subject-area courses. Since information literacy skills and concepts can be seen as disconnected from subject-area learning, considering how best to engage learners and motivate them to persist in online learning interactions that are *part* of a broader course experience is important. Additional research on how such experiences can be constructed to motivate learners to acquire new proficiencies and understandings can help librarians and instructional designers alike.

Also, there is virtually *no* research on online information literacy instruction and K-12 school library instruction. As primary and secondary classrooms increase their digital footprint, school librarians need to keep pace. Investigating how information literacy instruction in these settings can engage student motivation may help school librarians develop new roles and reach learners in new ways in K-12 education.

Sustained Face-to-Face Learning Experiences

While information literacy instruction is increasingly available online, K-12 school and academic libraries still conduct face-to-face instruction, and the research on motivational design in this instructional modality focuses on single workshops or one-off interactions. It would be useful to consider if, as Gross and Latham (2013) suggest, a sustained series of learning interactions designed with motivational models as an overlay could both impact

students' desire and persistence in working through information-seeking processes and significantly shape students' information literacy behaviors. Continued research is needed on how extended instructional interactions may help librarians develop deeper collaborative relationships with faculty and impact student learning in different ways.

CONCLUSION

Motivation is a critical factor in learning and instruction, and so instructional designers should consider how best to incorporate strategies to engage learners' extrinsic and intrinsic motivation when they structure and craft learning opportunities. For librarians who design information literacy or other library-centric instruction, considering motivation may significantly impact their teaching, because these experiences often overlay with discipline-focused instruction and may not naturally engage students' intrinsic motivation. By demonstrating the importance of research, critical thinking, and information evaluation skills to 21st century learners, school and academic librarians may increase knowledge retention and learning application across subject areas. Further research should be conducted to continue to determine how the ARCS model, and other motivational design strategies, can be best applied in both face-to-face and online library learning interactions so librarians and instructional designers alike can create the most meaningful and effective learning environments.

REFERENCES

American Association of School Librarians. (2007). *Standards for the Twenty-First Century Learner*. Retrieved from http://www.ala.org/aasl/sites/ala.org.aasl/files/content/guidelinesandstandards/learningstandards/AASL_Learning_Standards_2007.pdf

American Association of School Librarians and Association for Educational Communications and Technology. (1998). *Information power: Building partnerships for learning*. Chicago: American Library Association.

Arnone, M. P., Small, R. V., & Reynolds, R. (2010). Supporting inquiry by identifying gaps in student confidence: Development of a measure of perceived competence. *School Libraries Worldwide, 16*(1), 47–60.

Association of College and Research Libraries (ACRL). (2000). *Information literacy competency standards for higher education*. Retrieved from http://www.ala.org/ala/mgrps/divs/acrl/standards/index.cfm

Association of College and Research Libraries (ACRL). (2013, September). *The Future of the Standards*. Retrieved from http://acrl.ala.org/ilstandards/?page_id=19

Association of College and Research Libraries (ACRL). (2014, February). *Framework for information literacy for higher education: Draft 1, part 1*. Retreived from http://acrl.ala.org/ilstandards/wp-content/uploads/2014/02/Framework-for-IL-for-HE-Draft-1-Part-1.pdf

Association of College and Research Libraries (ACRL). (2014). *Framework for information literacy for higher education*. Retrieved from http://acrl.ala.org/ilstandards/

Association of College and Research Libraries. (ACRL). 2015. *Framework for Information Literacy for Higher Education*. Retrieved from http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/infolit/Framework_ILHE.pdf

Bloom, B. S. (1956). *Taxonomy of educational objectives: The classification of educational goals*. New York: Longmans, Green.

Booth, C. (2011). *Reflective Teaching, Effective Learning*. Chicago: American Library Association.

Cameron, L., Wise, S. L., & Lottridge, S. M. (2007). The development and validation of the Information Literacy Test. *College & Research Libraries, 68*(3), 229–237.

ChanLin, L. (2009). Applying motivational analysis in a web-based course. *Innovations in Education & Teaching International, 46*(1), 91–103. doi:10.1080/14703290802646123

Deci, E. (2004). Intrinsic motivation and self-determination. In *Encyclopedia of Applied Psychology*. Retrieved from http://huaryu.kl.oakland.edu/login?url=http://search.credoreference.com.huaryu.kl.oakland.edu/content/entry/estappliedpsyc/intrinsic_motivation_and_self_determination/0

Gagné, R. M., Briggs, L. J., & Wager, W. W. (1992). The events of instruction. In *Principles of Instructional Design* (3rd ed.).

[ARTICLE]

(pp. 177-97). Fort Worth, TX: Holt, Rinehart, and Winston.

General systems theory. (2006). In *Elsevier's dictionary of psychological theories*. Retrieved from http://huaryu.kl.oakland.edu/login?url=http://search.credoreference.com.huaryu.kl.oakland.edu/content/entry/estpsyctheory/general_systems_theory/0

Gross, M. & Latham, D. (2013). Addressing below proficient information literacy skills: Evaluating the efficacy of an evidence-based educational intervention. *Library & Information Science Research, 35*(3), 181–190. doi:10.1016/j.lisr.2013.03.001

Gross, M., Latham, D., & Armstrong, B. (2012). Improving below-proficient information literacy skills: Designing an evidence-based educational intervention. *College Teaching, 60*(3), 104–111. doi:10.1080/87567555.2011.645257

Hall, A. D. & Fagen, R. E. (1956). Definition of a system. *General systems: Yearbook of the society for the advancement of General Systems Research, 1*(1), 18–28. Jacobson, T. & Xu, L. (2004). *Motivating students in information literacy classes*. New York: Neal-Schuman Publishers.

Keller, J. M. (1987). Development and use of the ARCS model of instructional design. *Journal of instructional development, 10*(3), 2–10. doi:10.1007/bf02905780

Keller, J. M. (2010). *Motivational design for learning and performance: The ARCS model approach*. Springer.

Kuhlthau, C. C. (2004). *Seeking Meaning: A process approach to library and information services*. Westport, CT: Libraries Unlimited.

Latham, D. & Gross, M. (2013). Instructional preferences of first-year college students with below-proficient information literacy skills: A focus group study. *College & Research Libraries, 74*(5), 430–449. doi:10.5860/crl-343

Marcum, J. (2004). Information literacy. In A. Distefano, K. Rudestam, & R. Silverman (Eds.), *Encyclopedia of distributed learning*. (pp. 228–232). Thousand Oaks, CA: SAGE Publications, Inc. doi:10/4135/9781412950596.n81

Markey, K., Leeder, C., & St. Jean, B. (2011). Students' behaviour playing an online information literacy game. *Journal of Information Literacy, 5*(2), 46–65. doi:10.11645/5.2.1637

Mortimore, J. M. (2010). Making research make sense: Guiding college students into information literacy through the information search process. *Southeastern Librarian, 58*(3), 3–13.

Ritchey, R., Klein, J. & Tracey, M. W. (2011). *The instructional design knowledge base: Theory, research and practice*. New York: Routledge.

Scriven, M. S. (1967). The methodology of evaluation. In R. W. Tyler, R. M. Gagné & M. S. Scriven (Eds.), *American Educational Research Association Monograph Series on Curriculum Evaluation, Vol .1: Perspectives of Curriculum Evaluation*. Chicago: Rand McNally.

[ARTICLE]

Skinner, B. F. (1954). The science of learning and the art of teaching. *Harvard Educational Review, 24*, 86–97.

Small, R. V. & Arnone, M. P. (2000). *Turning kids on to research: The power of motivation*. Westport, CT: Libraries Unlimited.

Small, R. V., Zakaria, N., & El-Figuigui, H. (2004). Motivational aspects of information literacy skills instruction in community college libraries. *College & Research Libraries, 65*(2), 96–121. doi:10.5860/crl.65.2.96

Vancouver, J. (2004). Motivational taxonomies. In *Encyclopedia of applied psychology*. Retrieved from http://huaryu.kl.oakland.edu/login?url=http://search.credoreference.com/content/entry/estappliedpsyc/motivational_taxonomies/0

[ARTICLE]