Can Research "Send Me High?": Addressing Flow Theory
Mihaly Csikszentmihalyi’s (pronounced "chicks send me high") theory of flow state is a major component of positive psychology. Flow is considered the attainment of optimal experience and enjoyment, and constitutes a seminal concept in creativity theory. In popular parlance, flow is “being in the zone,” that exquisite purview generally achieved by artists, musicians, and athletes. Csikszentimihaly characterizes the flow state as autotelic, or intrinsically rewarding, an experience of ecstasy and self-motivation that paradoxically culminates in a simultaneous loss of self-consciousness and sense of time. Flow "...lifts the course of life to a different level. Alienation gives way to involvement, enjoyment replaces boredom, helplessness turns into a feeling of control, and psychic energy works to reinforce the sense of self, instead of being lost in the service of external goals. When experience is intrinsically rewarding life is justified in the present, instead of being held hostage to a hypothetical future gain." (Flow, 69)

Since the 1970s, flow studies have been widely implemented in education, business management, computer human interaction, the arts, and athletics, with groups as disparate as Japanese motorcycle gangs, sailors, Jesuits, and agrarian communities (Csikszentmihalyi, et al. 1992). The results indicate that flow occurs under eight conditions: having clear goals with a
defined objective and immediate feedback; having the opportunity for decisive action and skill levels comparable to the challenges; a merging of action and awareness; focused concentration; a sense of potential control; loss of self-consciousness; an altered sense of time; and the experience becoming autotelic or intrinsically worthwhile (Csikszentmihalyi, 1993 Evolving Self, 178-9). Of these conditions, the chief catalyst is the second: the relationship between the individual's skill level and the challenge of the task. Flow is achieved when an individual's skills and the challenge posed are equal, thus enabling a continual upward trajectory in both. Conversely, when a challenge is too great for an individual’s skill level, it leads to anxiety, and when skill level surpasses the challenge, the individual becomes bored. Finally, when both challenge and skill levels are too low, the result is apathy (Csikszentmihalyi, Optimal 262).i

Intuitively, one might expect flow to occur primarily during leisure activities, yet a cross analysis of studies of Italian students, Alpine farmers, Navajo community college students, blind nuns, and former addicts shows that it is "more often than the everyday work activities, the hard concentration of reading and studying, and the self-effacing discipline of religious rituals that make people feel good about their lives” (Massimini, Optimal, 76). Adjunct to this counterintuitive finding is the notion of complexification of the self, whereby a person gains a higher level of confidence with the realization that he or she has the skills to complete a complex challenge, and thereby “is prepared to face even greater challenges” (Massimini, 73). While many flow studies encompass the activities of everyday life, and are analyzed for the achievement of flow (or anxiety, boredom or apathy), during the course of a regular week, researchers have focused on specific processes, including writing high school research papers, ocean cruising, and surviving extreme solitary conditions (Larson, MacBeth, and Logan, 1992), as well as video gaming, human-computer interaction, “Facebook depression,” online consumer

In 1977, Csikszentmihalyi, Larson and Prescott developed a standard methodology called the Experience Sampling Method (ESM) to capture momentary subjective experiences at random times by participant self reports, and thus measure flow. ESM, also known as Ecological Momentary Assessment or Event Sampling Methodology, (depending on the focus of the study), has evolved from beepers and printed booklets to software that texts participants on a random or scheduled basis for the set period of the study (Optimal, 268; Hektner, et. al 2007).

The Experience Sampling Method measures individuals' emotional states multiple times over a specific time period, using scheduled electronic alerts. Participants are linked to a survey that asks what they are doing, including environmental details such as location and whether alone or with others, and uses Likert Scales to measure variables required to initiate the flow experience. Typically, flow studies are scheduled for a week with randomized alerts sent when participants aren't sleeping, and usually yield 56 data points per participants. Studies in everyday life capture a broad range of activities. However, event contingent study samples can be scheduled based on whenever the activity being measured is performed or encountered. This method has been used to track high school bullying and discrimination, for example, and requires a much longer timeframe than daily life studies because such incidents are not daily occurrences. Rather than receiving random alerts, subjects in event contingent studies may be prompted at a scheduled time to complete an entry based on whether the targeted experience occurred that day.

This study employs multiple qualitative methods including an intra-individual analysis of ESM results with a sample of five self selected undergraduate students in an introductory literature class to see whether students could attain flow while doing research for their
assignments, and whether and how, an ongoing relationship with a librarian could facilitate reaching flow. Although the majority of flow studies capture data from hundreds and even thousands of participants, analysis may be pursued from an individual level using ESM. Such analysis is used to measure intra-individual changes. In their handbook, *Experience Sampling Method: Measuring the Quality of Everyday Life*, Hektner, Schmidt, and Csikszentmihalyi stress the importance of comparative analysis in operationalizing flow using ESM: "[t]he important thing is not to attach a numerical value to this frequency, but to use the results comparatively, both within individuals and within groups, to assess where flowlike experiences are most likely to exist" (287). They offer multiple types of analyses of ESM data, including response-level, reflecting “one self-report form completed by one person in response to one ESM signal. A summary of these moments can be created in tables or graphs” (84). Small participant samples include Csikszentmihalyi’s study of ten blind nuns. Larson uses four examples from a larger sample of 90 to analyze the effects of over arousal and boredom on students writing high school research papers. (Csikszentmihalyi, Larson, Optimal). An ESM study on Latino children’s school careers conducted by Weisner, et al. (2001) had only eight participants culled from a larger study of ninety students whose participation did not entail ESM. As a phenomenological methodology, ESM interrogates individuals’ experiences, and lends itself to well to partnership with other qualitative methods, including ethnography, focus groups, and reflective journaling. Its strength is in providing in the moment feedback unclouded by the passage of even minimal time.

Flow theory has been generally embraced in the educational realm, with numerous studies across the developmental range, and in online education (Zirkel, 2015, Shin, 2006, Enrique, 2001). However, it has been only minimally employed in information behavior to
determine the likelihood of flow in users of mobile libraries in China. Zha (2015) and others found that mobile libraries require more development as users’ flow experience were significantly lower than that of users of digital libraries. Applying flow theory and ESM methodology to information behavior provides an opportunity to evaluate affect, to enlarge upon Fisher and Landry's call to take a "right brain" approach, and "raise research to a higher level by continuing to concentrate on context but add to it an emboldened emphasis on affect" (Nahl and Bilal, 229). It is impossible to separate the processes of cognition and emotion: feelings influence thought; thought influences feeling in all human activity. While much information behavior theory focuses on negative affect and its mitigation, flow theory instead asks, "Is this experience enjoyable?"

**Review of Related Literature**

*Flow and Existing Information Behavior Theory*

Wilson's General Model of Information Behavior provides a theoretical framework to integrate and operationalize Csikszentmihalyi’s flow concept into the literature, with its openness to "the interrelated nature of theory....whether drawn from other disciplines," and its effort to be "hospitable to explanations set out by others." (Wilson, T.D., as cited in Fisher 35). Flow theory incorporates affective and cognitive states, as well as environmental factors. Its holistic approach reflects the primacy of social constructivist theory in higher education.

Dervin's Sense-Making Model is similarly encompassing: "demand[ing] attention not only to the material embodiment of knowing but also to the emotional and feeling framings of knowing. …[a] holistic picture is drawn and there are no false dichotomies between cognitive versus affective elements constituting the fodder/ product. Hence, the issues of information use
are not limited to the cognitive realm of experience." (Savolainen 1118) The Model’s phenomenological based unit of analysis includes users' emotional states as they determine the efficacy of various sources during personal and academic information seeking situations. Sense Making Methodology's explicit focus on users, who "can usefully be turned to as 'theorists' of their own information seeking and use and inform us about how they saw their emotional and cognitive states and their consequences" especially echoes ESM. (Dervin in Nahl, 56)

Savolainen's Everyday Life Information Seeking (ELIS) model's "sense of coherence," or ongoing sense of confidence in one's capability to meet challenges that are meaningful and worthwhile leads to a "positive mastery of life" (Savolainen, 264 1995). This sense of coherence is similar to Csikszentmihaly's notion of ordered consciousness and study participants' strategies of cognitive restructuring to meet with external demands of their jobs. (Optimal, 136). ELIS characterizes approaches to information seeking by incorporating levels of optimism-pessimism and cognitive-affective, with corresponding levels of success. (as cited in Fisher, 147).

Finally, Foster's Non-linear Information Seeking model, (2005) strives to "show information seeking to be non-linear, dynamic, holistic, and flowing." Although it emphasizes cognitive aspects over emotional, and has experts as participants, it offers applicable constructs in its core processes, especially the idea of opening, which includes eclecticism and serendipity. These by their natures support flow theory's conditions of cessation of ego, loss of time, and intrinsic or autotelic motivation. In fact, these variables can easily be applied to Kuhlthau's invitational mode, as described below.

**The Effects of Affect Studies**

Information professionals have formally recognized the importance of user affect for over three decades, beginning with Mellon's grounded (and groundbreaking) theory of library

Nahl's Affective Load Theory (ALT), focuses on the mitigation of disruptive affective states to achieve information seeking success, and comes closest to addressing the areas of personal control, optimism, and motivation that are necessary to achieve the flow condition. User Coping Skills are measured by "two affective sub components acting together: Self Efficacy (SE) and Search Optimism (Op)." (Nahl Information, 16-17)\textsuperscript{1} Nahl's methodology is similar to the Experience Sampling Method (ESM) in its use of self reporting, although her participants predicted their levels of optimism and efficacy before performing specific searches. ALT emphasizes cognitive over affective behavior and seeks intervention once a high level of affective load is reached, when negative "learned affective norms" cause students to reach high levels of anxiety and frustration (Nahl 2007, 19-20). In contrast, flow theory measures affect grounded within the users' experiences, which are reported at specific moments or after the fact, instead of predictively.

Kracker showed that teaching Kuhlthau's Information Search Process (ISP) prior to students' need to perform research succeeded in lowering anxiety levels (Kracker, 2002). The ISP consists of six stages: Task Initiation, Topic Selection, Prefocus Exploration, Focus Formulation, Information Collection/Selection and Search Closure. Students experience
corresponding emotional ranges of confusion and anxiety, momentary confidence, anxiety and ambiguity, and finally, increasing confidence during information collection once a true focus has been achieved. (Kracker, 2002a 282). Kracker's participants knew to expect some level of anxiety and frustration as they encountered a wide array of sources that could pull them in too many directions, and experienced somewhat lower levels of anxiety than their classmates who did not learn about the ISP stages. Luo and Nahl further focused on searchers' emotional states during assigned internet search exercises contextualized to Kuhlthau's ISP stages, and found the model relevant to internet searching, with generally corresponding emotional responses. (Luo, 5-6)

Fulton states that "the affect revolution often focused on correcting breakdowns, mishaps, and misunderstandings in the information seeking process," and overlooked the possibility that research can be a pleasurable experience in and of itself. Yet relatively few approaches examine information seekers' potential for positive affect. Her interviews with amateur Irish genealogists found that pleasure is both inherent in the process as well as an outcome of their research. Participants indicated sheer delight in and even possible "addiction" to their research (Fulton, 253). Interestingly, Csikszentmihalyi cites ancestral genealogical knowledge in preliterate societies as an example of the necessary role memory plays in achieving flow, concluding that, "reciting lists of ancestors' names is a very important activity even today, and it is one in which the people who can do it take great delight" (Flow, 121).

Most poignantly, Bowler's study of metacognition in high school students found that their need to control their curiosity while researching was, in her word, "sadly," useful in order for them to complete the task of writing their papers. Curiosity about their topics caused both pleasure and pain- pleasure because of their personal interest, and pain due to the imposed nature
of the 7-8 page paper assignment. Such findings serve to validate Gross's imposed query findings (1998). "Sadly, it seems, ignoring the pleasurable aspects of information seeking is what actually gets you ahead." (1340). Her eloquent analysis bears repeating:

Intellectual curiosity is the lifeblood of learning and one of the goals of education is to promote this intrinsic desire to learn. To reflect this, information systems, teaching methods, and classroom structures are designed in ways that invite or invoke curiosity. Given this framework, it seems paradoxical, and perhaps ironic, that the participants in this study often associated curiosity during the search process with pain, not pleasure." (1342)

**Original Conception and Project Background**

Colorado State University-Pueblo is a regional comprehensive Hispanic Serving Institution located in Southern Colorado with an enrollment of just over 4500 students as of fall 2014. Students are a mix of traditional age and commuter students with jobs and families. The study was originally conceived as a partnership between a literature professor and librarian that would take place in an upper division research seminar class in American realism. The professor uses New Historicism in his pedagogical approach, which allows students a broad range of choice in artifacts and topic choices. As in Bowler’s study, this research-based curriculum lets students gain ownership of their work by having "choice and control over the questions, activities, and artifacts," thus making the research project interesting to them (1333). The researchers anticipated that a majority, if not all, members in this class would want to participate
since most of those enrolled had been inspired and excited in previous classes with the professor. That this class had many seasoned students familiar with the requirements of a research seminar would provide a firm grounding for the study of flow. Both researchers expected a high level of enthusiasm and participation by students who had the metacognitive abilities to think about the research process while engaged in it. Additionally, this group was less likely to succumb to the pressures inherent in Gross’s implied query model. After discussion of the implied query and its timeframe and grade-driven constraints, the librarian and faculty member wondered how lower level students might compare in their self reporting to the upper division students? They decided to widen the scope to include the professor's two sections of English 201, the first discipline-based course. Both courses used the same pedagogy and required three short article and artifact-based research papers that culminated in a longer paper and presentation.

Research questions were two-pronged. Student-based research questions included:

1. How/does flow manifest in the research process?
2. How/does this vary over time, according to research needs (e.g. from being introduced to the process to embarking on a specific assignment)?

While librarian-based questions were:

1. Does librarian affect in a one on one situation have an effect on students’ sense of, and potential attainment of flow?
2. Are there practices that librarians can use to model flow while doing research? If so, how do they best manifest in individual research consultations?

Project goals were to emphasize the iterative nature of research and to prove Csikszentmihaly’s hypothesis that as skill levels increase, so therefore will students’ intrinsic
satisfaction even in the imposed query classroom milieu: that indeed, they can achieve a state of flow, moving from one idea/resource to another. The pedagogical goal of the course was for students to move from imposed query information seeking to self generated searching based on readings and connections made between the primary and secondary resources that they found.

Participation requirements included four meetings with the librarian (initial intake, twice at student’s discretion, debrief), an orientation meeting, pre and post Bostick Library Anxiety Scale survey, event contingent ESM responses each time class-related research was performed, and brief reflection papers. The librarian would present two library instruction sessions to the entire class at key times during the semester and be available during scheduled class research time. The total semester participant time commitment averaged 12-15 hours, based on each ESM survey taking three and a half minutes to complete. Because the time involved was substantial, the researchers sought and obtained an internal research grant to provide up to twenty-four stipends for participants as well as to purchase Survey Monkey and Survey Signal software. Institutional Research Board approval was obtained concurrently with the grant application.

*The Best Laid Research Plans*

Due to unforeseen circumstances, the faculty research collaborator was only able to teach the first week of classes. The faculty member and librarian presented the project in tandem at initial class meetings, where some enthusiasm was generated. The second week, the librarian made research presentations (based on the original syllabi) to the three classes. By the third week of the semester, classes were re-assigned. The librarian took over teaching the upper division class and was able to partner with two faculty who took over the ENG 201 sections. Because of the obvious ethical considerations, the first targeted class was unable to participate in
the study. These significant changes greatly impacted the study in terms of student participation, the integration of course content and pedagogy, library instruction and survey design.

**Method**

*Addressing Flow*

In order to measure flow, a validated ESM data collection form used for Schneider and Waite's 2005 Family 500 Survey was created on Survey Monkey. The ESM survey was customized to include various local library and archives as well as specific library research tools, Google Scholar, and popular search engines. It was structured based on the number of class assignments and could be filled out an unlimited number of times. Survey Signal software is designed for ESM studies and provides scheduled texting with survey links. Participants registered their smart phones and agreed to receive daily texts each day of the semester at 7:00 p.m. until the last day of class. Typically, set rather than randomized alerts are used for event-contingent studies, while daily living studies use random alerts to capture the broadest range of activities. Those participants who did not own smart phones were sent regular email reminders from Survey Monkey linking to the ESM form. The form was filled out only when research had been done for the class.

For the purposes of this study, flow was operationalized as achieving one standard deviation over the mean for the individual's research session based on zscores for each search session. In this way, an individual's experiences are compared only to that individual, and not with the results of others whose mean may vary considerably. In ESM, "mean values are calculated for each person's responses to a given item, and these means, rather than specific
responses, are used in analysis. Thus, the unit of analysis is the *person*, not the *response*
(Hoogstra, 21).

*Addressing Librarian Affect*

In order to address questions about librarian affect, the Bostick Library Anxiety Scale
was administered initially to provide baseline data, and at the conclusion of the semester to
measure changes in student perception of the librarian. Due to the many procedural changes and
new syllabi, project requirements were reduced to one reflection paper for the entire semester.
Participants responded to the prompt: "Describe your experiences researching this semester- did
you gain confidence as you conducted more research during the course of the semester? If so,
what factors helped you to gain confidence? If not, what factors prevented you from gaining
confidence? What was your initial response to having to find specifically scholarly sources? Did
you have an idea before taking this class of what scholarly sources are? Do you now? Please
speak to the various resources you used: library databases (which ones?), the book catalog,
Google, Bing, Google Scholar, and any others. Did knowing a librarian was interested in your
research process help you feel more comfortable? Did meeting in class or outside of class
increase your abilities? Your confidence in your abilities?"

**Results**

*Project Participation*

Ultimately, six students of a total of twenty-nine in the two sections of Introductory
Literary Studies (ENG 201) self selected for participation, with five actively completing the
study. They ranged in age from 21 to 62, and were comprised of sophomores and juniors.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Age</th>
<th>Ethnicity</th>
<th>Year/Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>transgender</td>
<td>43</td>
<td>Hispanic</td>
<td>Sophomore/History</td>
</tr>
<tr>
<td>B</td>
<td>female</td>
<td>29</td>
<td>Caucasian</td>
<td>Sophomore/English</td>
</tr>
<tr>
<td>C</td>
<td>female</td>
<td>25</td>
<td>Caucasian</td>
<td>Junior/English/Secondary Education</td>
</tr>
<tr>
<td>D</td>
<td>male</td>
<td>62</td>
<td>Hispanic</td>
<td>Junior/English</td>
</tr>
<tr>
<td>E</td>
<td>male</td>
<td>21</td>
<td>Caucasian</td>
<td>Junior/English</td>
</tr>
</tbody>
</table>

Participants A, C, and D had transferred from local community colleges and were new to the university. All participants demonstrated a high level of metacognition and were able to articulate their research experiences, skill levels and confidence levels in their reflection papers.

**Increased Skills, Increased Confidence and Flow**

Of the search sessions captured via ESM, one yielded a flow state. For most participants, z-scores increased as the semester progressed, supporting the hypothesis that searching becomes more enjoyable as students’ skills and familiarity with the databases increased. Z scores for participants’ search sessions are included in Figure 1. Participants C and E provided surveys for two sessions, respectively, making their results statistically invalid as there was no mean. Participant D’s third research session yielded a flow state based on the operationalized definition of one standard deviation above the mean for all of his search sessions.
Anxiety Decreased: Librarian's Role Mildly Vindicated

Over the course of the semester, participants showed mild decreases in library anxiety. As measured by the Bostick Scale protocol there was an 11 point level of decrease using raw scores, from an average of slightly over 122 to 111.5. Participant A's level decreased by 23%, from 121 to 98, while Participants D and E had more modest decreases of 12% and 5%, respectively. Participant B's score remained the same throughout. She indicated her lack of engagement in her reflection paper: "My initial response was a lack of enthusiasm for the research we had to do and I felt like I had to actually try to push myself to start the work. I usually really enjoy doing research, I think that because I had too much going on this semester, I lost most of my excitement for it." Participant C did not complete a post project Anxiety Scale, and is not represented.
Of specific interest for this project were the Bostick tool subscales measuring Affective Barriers, Barriers with Staff, and Knowledge of the Library. Respectively, anxiety in these areas was reduced by averages of two and a half points (33.5 to 31); a mere 3/4 of a point (38.25 to 37.25); and two points (14.75 to 12.75). These results, although discouraging in a study focused on user and librarian affect, were mitigated by statements in the reflection papers. These reemphasized students' sense of confusion and not-knowing how to effectively and confidently use library resources, and their increasing sense of relief in knowing they can ask a librarian for assistance.

**Consultations**

Because of the significant changes in syllabi, class visits and consultations for one class were merged. The librarian attended a research day where students spent time choosing a topic for their paper. This time was not particularly well spent because it was too early in the research
process. Although the librarian assisted three of the participants in preliminary searching, all ended up modifying or vastly changing their topics. These individual sessions were counted as consultations for the project. Two participants scheduled one each out of class consultation, one participant gradually faded away after one consultation, and one was a regular visitor of the librarian’s at the reference desk and in her office. One student’s confusion about finding sources in an ESM response prompted the librarian to e-mail her with suggestions, including discussing her topic choice with her instructor.

Participants' Research Processes

This small sample lends itself to the intra-individual analysis ESM provides by monitoring individuals’ experiences. And, indeed, each individual’s experience in gaining and applying search skills was unique. For her paper, Participant A traced the evolution of Batman, his various nemeses and the graphic novel *Maus* while pursuing her interest in graphic novels. She displayed increased levels of cognitive restructuring as the semester went along by routinely checking sources such as the catalog, JSTOR, ArtSTOR, MLA, and (although the library doesn't have a subscription), Project Muse. She did not schedule consultations, but received assistance during scheduled research time in class. She voiced her frustration via the ESM survey: "My research material involves the graphic novel Batman the Dark Knight Returns. The problem with some of the journals one in particular starts off addressing the novel but it veers off with the movie. Neither of them are alike so I'm not sure whether I can use it or not. I think the author of the journal might just be comparing the two." This led to email assistance from the librarian in using database format limiters.

Participant B in three separate research sessions sought sources on Dante's *Inferno* using JSTOR; *The Inferno* and *The Odyssey* using Google Scholar and Google; and ecocriticism on


Fight Club using Google Scholar and Google. She stated in her reflection paper that, "I did not use the library databases as much, but the ones I did use it for was for my Animal Behavior class and I used the science databases for my project....My confidence has improved considerably since last semester and I know that I will be able to cruise the databases with a little more efficiently (sic) and I know that if I cannot find what I am looking for, I can go to a librarian and receive help."

The remaining three participants met with the librarian outside of class and at various stages of their research. Participant C focused on Japanese haiku and Anne McCaffrey sources, and found MLA and Gale Literature Criticism allowed her to hone in on works by title and critiques. She had worked previously at a community college library, but extended her knowledge of the University's collections. Participant D admittedly had a high level of anxiety about using the library initially, writing, "I was very apprehensive at first about learning the processes of researching, considering I was new to the University and the Library in general." Through the semester, he traded in his habit of doing schoolwork at home for a specific workstation in the library. He worked full time during the evenings, and thus had to schedule himself strictly to accommodate his studies. Of all the participants, he benefited the most by knowing he had a contact in the library that would assist him in his acclimation to the university and the increased rigor of the assignments. His assignments required literary critiques of specific works, and in his research sessions, he utilized the library's metasearch tool and the catalog. During consultations, he learned about MLA, JSTOR, and Linguistics and Language Behavior Abstracts, the last which assisted him for another class.

Finally, Participant E demonstrated that timing is everything with regard to research consultations. He had worked with the librarian to find sources on The Kite Runner during the
topic selection class, but it wasn't until he met at the end of the semester for project debriefing, that he realized his interest didn’t lie with that work. A nearly hour long search consultation and conversation ensued, as he changed his focus to the analysis of reason and nonsense in *Alice in Wonderland*. The session involved elements of flow in that both librarian and student evaluated sources while making connections, engaging in focus formulation. The sense of time was lost while a thesis evolved based on the student's interests and in conjunction with the focus of the criticism found in the databases. While there is no numeric artifact of this session, it resulted in a very successful research collaboration.

**Discussion**

This project was unable to be accomplished as originally conceived. Without the faculty collaborator and the curricular construct of New Historicism, the organic extension to flow theory was profoundly impaired. Losing the opportunity to include upper division English students familiar with the research seminar milieu severely limited the number of participants. Library instruction was updated to support new course content for the introductory classes. However, the grant funding had to be disbursed within the academic year, adding impetus to continue with the study as planned despite the many changes.

Certainly a much larger study with the benefit of a research team and long term funding would yield deeper and broader results. However, even these limited data support the idea that flow is attainable, that with the increase of skills comes an increase in confidence and hence, even enjoyment. It should be noted that those who did participate were highly motivated to succeed and interested in examining their own cognitive processes. This may be a limitation of ESM in that participants know they are committing to a time intensive process and therefore only those who are more motivated will join a study. Future studies of flow in the academic research
process would benefit from faculty collaboration and more focused activities. In retrospect, there were too many pieces and perhaps too many requirements of participants. With regard to librarian affect, approachability remains key. An open door and willingness to be engaged with students whether by schedule or chance encounter are signals of support. Modeling Kuhlthau’s invitational mode when a student is seeking her topic can help broaden her ideas or apply her personal interests to the assignment. Study participants noted their appreciation for the librarian's personal attention and willingness to meet with them, even while they were in the initial stages of their process and very unsure of their topics. A direct result of this project has been adding a presentation of the Information Search Process to library instruction to let students know that their feelings are valid and they are not alone in their initial confusion as they seek clarity and focus. Having a librarian acknowledge and explain the affective dimensions of research opens the way for future communication at the reference desk.

Conclusion

"You Don't Need It 'til You Need It"

Library instruction and research consultations' efficacy hinge on timing. As Participant E wrote, "[The librarian] has been in my classes before talking about these databases but it never really clicked how important they were until now." This student also wrote "...it was really great to have someone be interested in what I was writing about as well." Student interest in a topic is necessary to creating a meaningful learning outcome and a goal to achieve during consultations. Without interest, there is little desire to learn more and little chance of enjoyment in learning.

Perhaps the most meaningful result of the project for the students has been the potential to view their research as a positive experience with the acquisition of research skills and the
knowledge that they have allies in their academic librarians. Equally important is that librarians can acknowledge flow potential and seek to invigorate students toward that end. Students need not be embarrassed to ask for assistance, while librarians need reassure them of their friendliness and accessibility, and be willing to *Look people in the eye (and) Make them feel good.*

**Notes**

i Massimini and Carli’s work on Milanese teenagers led to this quadrant based result, which was incorporated into ESM methodology.

ii For a comprehensive description of ESM and a well-argued and impassioned call to educators to use ESM in creative ways, see Zirkel, et al.

iii Nahl measures Self Efficacy using three items at the beginning of the search session: "How sure are you that you will succeed in this task? Doubtful (1) to Almost certain (10). How likely is it that you will become good at this type of task? Pretty doubtful (1) to Almost certain (10). How much luck do you have in searching in comparison to other types of tasks? I have bad luck (1) to I always find something useful (10).” Search Optimism is measured using these three items: "How motivated are you to keep on trying today until you succeed? Slightly motivated (1) to Very highly motivated (10). Computers and search engines make it easy for people to find what they're looking for. I strongly disagree (1) to I very much agree (10). How likely is it that there will be something specific on what you're looking for? Not likely (1) to Very likely (10)." (Nahl Information 17) It is important to distinguish Nahl's social-biological and ecological constructionist approach which evaluates users' information seeking based on affective, cognitive and sensorimotor behaviors from Dervin's and Csikszentmihalyi's phenomenological approaches, which measure the users' self reported experiences during and after the fact. (Bilal in Nahl Information 41).]
Appendix

Figure 3 ESM Form (based on 500 Family Study)

Indicate how you felt as you were researching: (Please circle one number for each question)

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all</th>
<th>A little</th>
<th>Somewhat</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you enjoy what you were doing?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was this activity interesting?</td>
<td></td>
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<tr>
<td>How well were you concentrating?</td>
<td></td>
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<tr>
<td>Were you living up to your own expectations?</td>
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<tr>
<td>Did you feel in control of the situation?</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the situation allow you to be involved or to act?</td>
<td></td>
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<tr>
<td>Did you have the abilities to deal with the situation?</td>
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<tr>
<td>Was the activity important to you?</td>
<td></td>
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<tr>
<td>Were others expecting a lot from you?</td>
<td></td>
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</tr>
<tr>
<td>Were you succeeding at what you were doing?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you wish you were doing something else?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you feel good about yourself?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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