
Investigating How English Language Learners Feel during their Research Project with the Framework of Kuhlthau's ISP

Sung Un Kim

**Department of Library and Information Science
Catholic University of America, USA**

As part of a larger study about the information-seeking process of English language learners (ELLs), this article reports on affective states of ELL students during their research project with the framework of Kuhlthau's Information Search Process (ISP). Forty-eight ELL students from three classes of a high school in the United States participated in the study. Data were collected through a demographic questionnaire and process surveys. The results indicate that ELL students, as a whole group, became significantly more relieved and satisfied and less frustrated and confused as they progressed in the research project. When three different ELL level groups were compared, only the intermediate group showed significant increases in positive feelings, particularly in relief and satisfaction. In addition, students who received systematic interventions during the research process showed less confusion in the initiation stage than those who had few interventions. When the research topic was about students' life decision, their personal lives and situation influenced their feelings during the research project.

Introduction

From the constructivist perspective, people's emotions during their information-seeking process have received attention as a factor influencing their thoughts and actions throughout their knowledge construction process (Bilal, 2005; Kuhlthau, 2004). However, school instructions have not adequately recognized the interaction between emotions and learning (Kort, Reilly & Picard, 2001) and have not been successful in teaching that "all these feelings associated with various levels of failure are normal parts of learning, and that they can actually be helpful signals for *how* to learn better" (p. 43).

Related to this, research has shown that native language is one of the influential factors to predict college students' anxiety during the learning process (Jiao, Onwuegbuzie & Lichtenstein, 1996) and non-native English speaking students tend to be more anxious about their research (Jiao & Onwuegbuzie, 1997). However, little attention has been paid to understanding how English language learners feel during the research process in the high school context.

As part of a larger study that investigated three dimensions of the ISP model – affective, cognitive, and behavioral – during the research process of ELLs, this paper reports on the affective aspect of the findings, highlighting the emotional changes and impacts of English language proficiency and

the nature of research task on students' feelings. The cognitive aspect of the study was reported in another paper (Kim, 2015b) which examined the knowledge development process of ELLs in terms of amount and substance of knowledge, labeling of knowledge, estimate of interest and knowledge, and amount and substance of learning outcome. The behavioral aspect explored ELL students' easy or challenging tasks, the types of assistance they need during their research process, and instructional strategies employed by teachers and librarians (Kim, 2015a).

This paper will address the following research questions: (a) What emotional changes do ELL students experience, with particular focus on positive affect (confidence, relief, optimism, and satisfaction) and negative affect (disappointment, frustration, confusion, uncertainty, anxiety and concern about their English proficiency), as they engage in a research task? (b) How do ELL students' levels of English language proficiency impact their feelings during the research process? (c) How does the nature of research task impact ELL students' feelings during the research process?

The term *English language learner (ELL)* used mainly in the United States to describe kindergarten through high school students who are acquiring English and have a first language other than English. The term *English as a Second Language (ESL)* is formerly used to designate ELL students. *ESL* is still used to refer to multilingual students in college, and to describe an instructional program or a teacher supporting ELL students (NCTE, 2008).

Literature Review

Kuhlthau's ISP and Related Studies

Reflecting a constructivist learning paradigm, Kuhlthau (1991, 2004) developed and confirmed the ISP from a series of five studies investigating users' information-seeking patterns (Kuhlthau, 1983, 1988a, 1988b, 1989; Kuhlthau, Turock, George, & Belvin, 1990). The ISP articulates "the user's constructive activity of finding meaning from information in order to extend his or her state of knowledge on a particular problem of topic" (Kuhlthau, 1991, p. 361) by demonstrating affective, cognitive, and behavioral dimensions of search process according to six information tasks: initiation, selection, exploration, formulation, collection, and presentation (Figure 1).

Tasks	Initiation	Selection	Exploration	Formulation	Collection	Presentation
Feelings (affective)	uncertainty	optimism	confusion/ frustration/ doubt	clarity	sense of direction/ confidence	satisfaction or disappointment
Thoughts (cognitive)	vague	→		focused	→	
Actions (physical)	seeking relevant information exploring		→		seeking pertinent information documenting	

Figure 1. Model of the Information Search Process (ISP) (Kuhlthau, 2004, p. 82).

Kuhlthau's (2004) ISP played a pioneering role in considering the feelings of information users, along with thoughts and actions, as crucial components of the information search process. The ISP demonstrates that people initiate a research task with uncertainty, go through optimism,

confusion, frustration and confidence during the search process, and feel satisfied or disappointed at the completion. Kuhlthau (1993) defined uncertainty as “a cognitive state that commonly causes affective symptoms of anxiety and lack of confidence” (p. 347). Negative feelings are often associated with vague thoughts about a topic in the beginning, thus once thoughts become more focused and developed, those negative feelings tend to diminish (Kuhlthau, 1993, 2004). The uncertainty principle has been acknowledged as a useful variable in understanding information seeking behavior, particularly in complex search situations (Wilson, Ford, Ellis, Foster & Spink, 2002).

Research has found that awareness of the ISP reduces the anxiety that people experience during research. Kracker (2002) investigated how undergraduate students’ knowledge of the research process influences their feelings during their work on a research paper. The findings show that a 30-minute presentation of Kuhlthau’s model reduces students’ anxiety (Kracker, 2002). The content analysis of students’ writing about their feelings identified and categorized 25 affective categories in three dimensions: emotional states (negative, positive, or a change from former to later), perceptions of the process (difficult or easy), and affinity for research (dislike or interest). The results show that the presentation of the ISP model increased awareness of emotional states, while it showed little effect on the other two dimensions (Kracker & Wang, 2002). Battle (2004) examined the effect of information literacy instruction on library anxiety among international students at a community college. This study showed that students who had information literacy instructions, based on Kuhlthau’s ISP model, had less library anxiety than those who did not, after they completed the library assignment (Battle, 2004).

Emotions during the Information-Seeking Process

Research has revealed that feelings occur in association with thoughts, and their relationship with search performance is mutual. Tenopir and her colleagues (2008) examined how academic users (faculty, students and librarians) interact with the ScienceDirect information system while they complete a given task in a lab setting. Their findings exhibit that positive feelings are more likely to occur with thoughts related to search results, while negative feelings were associated more often with thoughts about the system, search strategies and task (Tenopir, Wang, Zhang, Simmons & Pollard, 2008). Wang, Hawk and Tenopir (2000) found reciprocal relationships between users’ feelings and search performance. Positive feelings reinforce users’ interactions with a system, while negative feelings hinder them. On the other hand, successful search performance diminishes negative feelings and increases positive feelings (Wang, Hawk, & Tenopir, 2000).

There have been efforts to develop a model to demonstrate interactions between feelings and crucial factors that influence them. To examine the anxiety graduate students experience while writing research proposals, Onwuegbuzie (1997) collected and analyzed students’ reflexive journals, anxiety questionnaires, and research proposals in research methodology classes. The results show that students’ anxiety during the writing process consists of library anxiety, statistics anxiety, composition anxiety and research process anxiety. Among various components of library anxiety, fear of seeking help from a librarian and a lack of available resources appear to be predominant factors influencing students’ research performance. After continuous studies on library anxiety, Onwuegbuzie and Jiao (2004) proposed and tested the Anxiety-Expectation Mediation (AEM) model of library anxiety, which shows library anxiety and academic self-perception mediate the relationship between research performance and other personal variables such as age, learning style, grade point average, and academic procrastination. Kwon, Onwuegbuzie and Alexander (2007) examined the association between critical thinking disposition

and library anxiety (affective barrier) among graduate students, and found weak dispositions toward critical thinking, particularly in critical thinking self-confidence, inquisitiveness, and systematicity, were associated with high levels of library anxiety in the areas of affective barriers and knowledge of the library.

Gwizdka and Lopatovska (2009) found that people with less effective search strategies and fewer relevant results saved felt less satisfied with the search, but felt less lost during the search. Also, people who estimated the task to be easy and felt happy before and during the search process were more likely to feel happy after the search, but with worse search outcomes and lower satisfaction (Gwizdka & Lopatovska, 2009). Lopatovska's (2014) proposed model indicates associations between primary emotions (collected from analysis of facial expressions) and search actions and between secondary emotions (collected from interviews) and searchers' assessment of quality of search performance.

In spite of recent attention to the emotional dimension of information search process, only a few studies explored the feelings of culturally and linguistically diverse people during their information search process. Jiao, Onwuegbuzie and Lichtenstein (1996) revealed that native language is one of the influential variables, along with age, sex, year of study, grade point average, employment status, frequency of library visits, and reason for using the library, to predict college students' library anxiety. In another study, Jiao and Onwuegbuzie (1997) found that non-native English speaking students are likely to show higher levels of library anxiety in terms of barriers with staff, affective barriers, and mechanical barriers than native English speaking students. Furthermore, little has been studied about ELL students' emotions in the high school context while they interact with information for a specific research task (e.g., Ellis, 2008; Kim & Todd, 2008).

Research Design

Participants

The participants in the study were 48 ELL students in a public high school, located in New Jersey in the United States. They came from a theme class where an ESL teacher taught language and literature on contemporary themes, and two biology classes where a biology teacher taught in collaboration with the bilingual/ESL supervisor. There are the six levels of English language proficiency defined by the World-Class Instructional Design and Assessment Consortium (WIDA, 2013): 1–Entering, 2–Emerging, 3–Developing, 4–Expanding, 5–Bridging, and 6–Reaching. Among them, the theme class consisted of ten ELL students with ELL level 5 (11th grade), and the biology classes consisted of eighteen students and twenty students, respectively, with mixed ELL levels from level 2 through level 5 (9th through 12th grade). According to the terms used in the recruited school, this study uses *beginning group* for level 2 (29.2%, n = 14), *intermediate group* for levels 3 and 4 (33.3%, n = 16), and *advanced group* for level 5 (37.5%, n = 18). (For a more detailed description of the research design that is generally applied to the larger study, see Kim (2015a, 2015b).)

Research Tasks

Students in the theme class and the biology classes performed different types of research tasks. Ten students in the theme class were required to write a research paper on their career and college preparation through 20 class sessions for 5 weeks with systematic interventions provided. Thirty-eight students in the two biology classes were required to create a six-page, multilayered foldable on a self-chosen genetic disorder through 12 sessions for 4 weeks, with only few interventions provided. The research tasks are compared in Table 1.

Table 1. Comparison of research tasks.

	Theme class (n = 10)	Biology classes (n = 38)
Topic	Career and college preparation	Genetic disorder
No. of sessions/duration	20 sessions for 5 weeks	12 sessions for 4 weeks
Instructions	Systematic interventions provided, e.g., vocabulary, background knowledge, database search, outlining, citations	Only few interventions provided, e.g., overview of different kinds of genetic disorders, visit to school library
Midpoint products	Note cards, outline, rough draft	N/A
Final products	Research paper	Six-page, multilayered foldable with bulleted statements
ELL level	Level 5	Levels 2–5

Data Collection

While the participating students were undertaking their research project, the researcher collected data through a demographic questionnaire and process surveys.

Demographic questionnaire. The researcher conducted the paper-based questionnaire before students began the research project. The questionnaire included questions about students' age, gender, ethnicity, ELL level, country of birth, length of time living in the United States or other countries, and language(s) spoken at home.

Process surveys. The researcher conducted process surveys at three points during the research project: initiation (PS1), midpoint (PS2), and completion (PS3). The surveys were based on the Student Learning through Inquiry Measure (SLIM) toolkit (Todd, Kuhlthau, & Heinström, 2005). The surveys consisted of questions about cognitive, affective, and behavioral aspects of information search process. This article includes findings about the affective aspect (questions 5 and 6). Through the process surveys, students were asked to quantify their affective status as "0=not at all," "1=a little," "2=some," or "3=a lot" in terms of positive feelings – confidence, relief, optimism, and satisfaction– and negative feelings – disappointment, frustration, confusion, uncertainty, and anxiety – which were identified and tracked in ISP studies (Kuhlthau, 2004; Kuhlthau, et al. 2008). They were also asked to explain reasons for their feelings. In addition to those nine feelings, students were asked to rate their concern about English language proficiency, and explain what concerns they had with reading, writing, listening, and speaking in English for the project.

Data Analysis

The participating students' answers on the questionnaire and three process surveys were typed in Excel spreadsheets. The researcher coded categorical answers into numbers, and analyzed open-ended answers with content analysis. Then all manipulated data were entered in SPSS and analyzed to produce descriptive statistics and to use analysis of variance (ANOVA) and *t*-tests to determine whether students' feelings varied significantly by English language proficiency (comparison among three ELL groups in the biology classes) and research task (comparison between the advanced students in the biology classes and those in the theme class). Repeated-

measures ANOVA were used for examining the changes of students' feelings over time. Of the 48 total participants, 28 students who submitted the process surveys at all three times were included in the statistical analysis, while all participating students were considered in analyzing the open-ended answers.

Results

Confidence

Students' overall confidence decreased from PS1 to PS2, and increased from PS2 to PS3. However, the changes in confidence between stages were not significant (Figure 2). When students were asked about reasons for their feeling, they reported:

"[I feel confident] because this is not the first time I've researched a project for biology." (s11, PS1)

"... because I have that all planned out." (s48, PS1)

"... because now I know more about what I like to do." (s10, PS2)

"... because I know more about my topic and I can do better." (s22, PS2)

"... because I am learning a lot." (s33, PS2)

"... because I finish my project and I want to know if good or not." (s1, PS3)

There were no significant differences in confidence among the ELL level groups or between stages in all ELL groups of the biology classes and the advanced group of the theme class. However, there were some interesting patterns found. For instance, in the biology classes, the beginning group was less confident than the other groups throughout the research process. In addition, in all ELL level groups of the biology classes, the students' confidence decreased from PS1 to PS2 and increased from PS2 to PS3. It appeared that in the biology classes, difficulty caused from finding information between PS1 and PS2 reduced students' confidence at PS2. Conversely, students in the theme class, who were expected to use one main database, Family Connection, and had structured instruction on how to use it, showed increased confidence at PS2 (Figure 2).

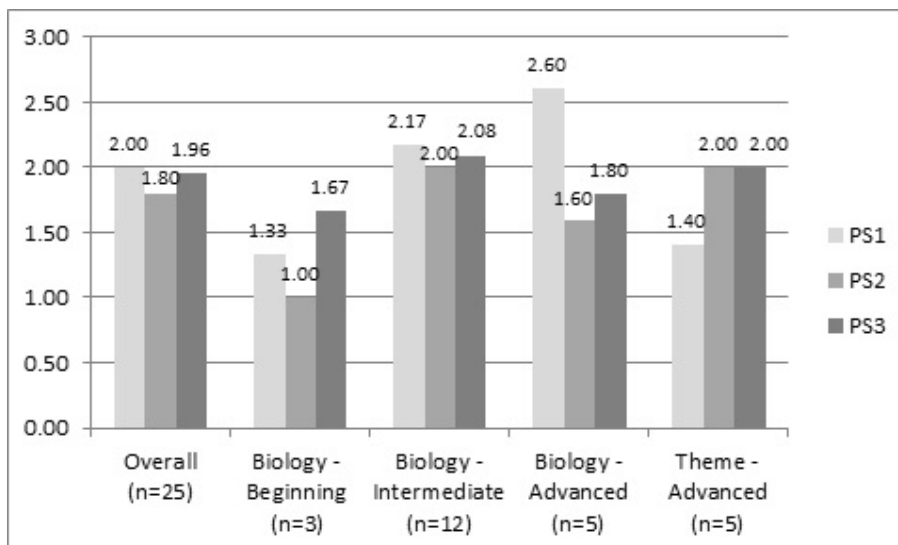


Figure 2. Confidence by ELL level and class (n=25).

Relief

Students, as a whole, expressed more relief as their research projects progressed. The level of students' relief stayed between "1=a little" and "2=some." There were significant differences in relief: PS1–PS2, $t(24) = 3.219$, $p < .01$; and PS1–PS3, $t(24) = 3.392$, $p < .01$ (Figure 3). When students were asked about reasons for their feeling, they reported:

"[I feel relieved] because I have much information now that is very helpful for my essay. And by reading and researching about my topic it makes easier for me to write." (s7, PS2)

"... because I get much more information than before by researching." (s18, PS2)

"... because before I started this project I was little nervous, but when I finished I realized that it wasn't that hard." (s7, PS3)

"... I finished it on time." (s48, PS3)

In the biology classes, different from the beginning group and the advanced group, the intermediate group expressed progressively more relief throughout the research project and a significant difference in relief: PS1–PS3, $t(11) = 3.079$, $p < .05$. No significant differences in relief were found among the ELL level groups or between the types of research project; however, there were tendencies found that the beginning group was less relieved than the other groups throughout the research process, and the advanced group in the theme class expressed progressively more relief throughout the research project (Figure 3).

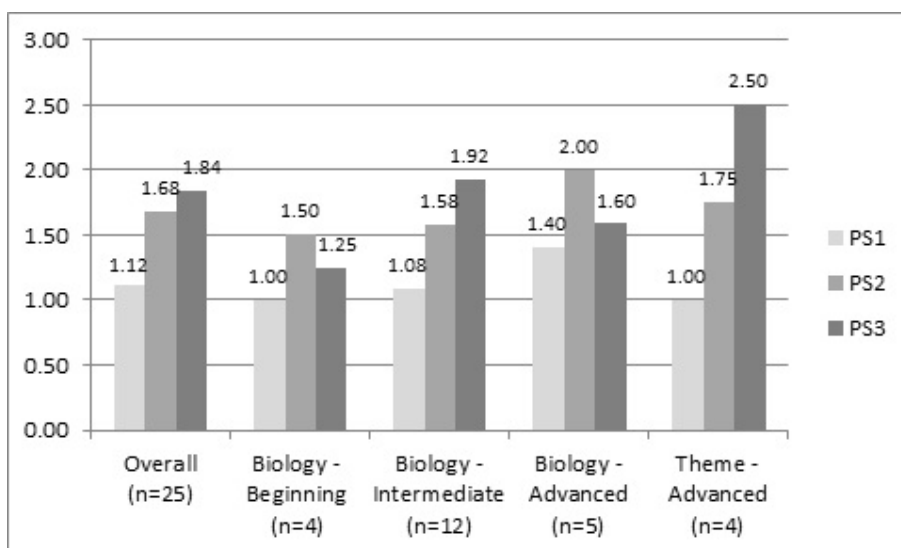


Figure 3. Relief by ELL level and class (n=25).

Optimism

Overall, students felt more optimistic as they progressed in the research project. The level of the students' optimism stayed between "2=some" and "3=a lot." The changes between stages were not significant (Figure 4). When students were asked about reasons for their feeling, they reported:

"[I feel optimistic] because I like the topic, and I think that is really important." (s9, PS1)

"... because I know I can do it." (s15, PS1)

"... because I want to learn more about this disease, and also I can help people with sickle cell anemia." (s22, PS1)

"... because I can see an opportunity to make up my grades in this class." (s24, PS1)

"... because I like the topic and I can learn searching information." (s26, PS1)

"... because I get help from other people I start after-school to use the computer to do my project." (s38, PS3)

"... because I can't wait now to go to college and start learning more about this career." (s10, PS3)

"... because I did a good job." (s22, PS3)

In the biology classes, only the intermediate group showed continuous increases of optimism during their research process; however, the changes between stages within each ELL level group were not significant. Moreover, there were no significant differences in optimism at each stage among the ELL level groups (Figure 4).

The advanced group in the theme class differed from the advanced group in the biology classes in that they showed continuous increases in optimism; however, there were no significant differences between stages, or between the advanced groups in the biology classes and in the theme class (Figure 4).

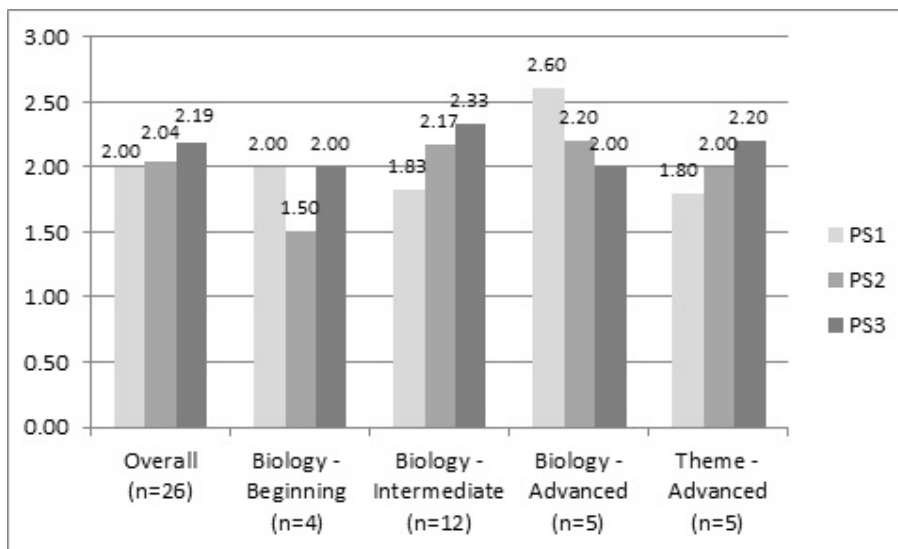


Figure 4. Optimism by ELL level and class (n=26).

Satisfaction

Students, as a whole, became more satisfied as they progressed in the research project. There were significant differences in satisfaction: PS2–PS3, $t(25) = 2.184$, $p < .05$; and PS1–PS3, $t(25) = 2.273$, $p < .05$ (Figure 5). When students were asked about reasons for their feeling, they reported:

"[I feel satisfied] because I know many things about Hotel Management than before." (s3, PS3)

"... because I've done with the project and I think I did good." (s15, PS3)

"I feel very happy with my project because I know I did my best." (s17, PS3)

"... because I did it with my full concentration and hard work." (s20, PS3)

"... because I've improved my knowledge." (s41, PS3)

In the biology classes, the beginning group maintained the same level of satisfaction throughout the research process. The advanced group in the biology classes showed continuous decreases in satisfaction, whereas the intermediate group showed continuous increases throughout the research process. There were significant increases in satisfaction of the intermediate group: PS2–PS3, $t(10) = 2.609$, $p < .05$; and PS1–PS3, $t(10) = 3.105$, $p < .05$. The advanced group in the theme class exhibited continuous increases of satisfaction; however, the increases were not significant. They had no significant differences in satisfaction from the advanced group in the biology classes (Figure 5).

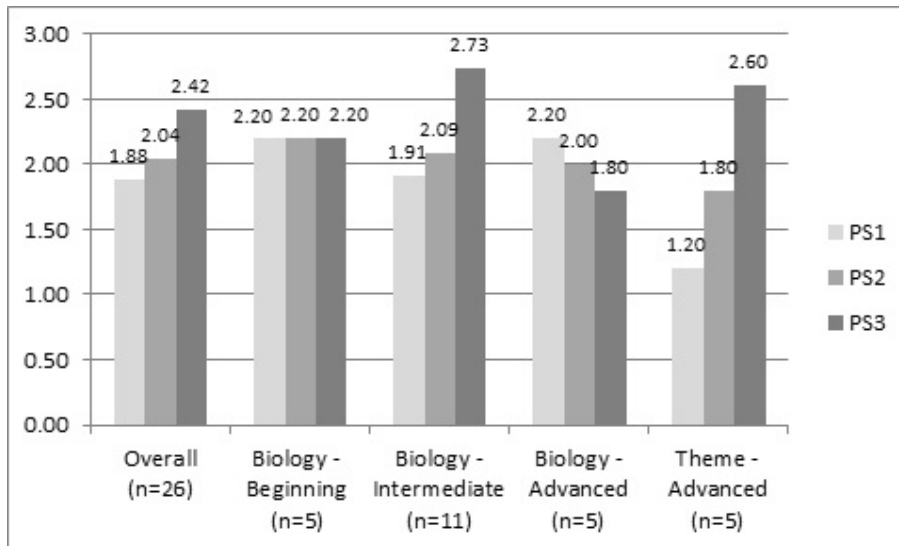


Figure 5. Satisfaction by ELL level and class (n=26).

Disappointment

Students became less disappointed as they progressed in the research project. Throughout the research process, students stayed between “0=not at all” and “1=a little” in terms of their disappointment. However, the changes in the students’ disappointment between stages were not significant (Figure 6). When students were asked about reasons for their feeling, they reported:

“[I feel disappointed] because the due date is close and I have nothing done yet.” (s44, PS2)

“... because sometimes I don’t understand vocabulary.” (s36, PS3)

In the biology classes, the beginning group was more disappointed than the other groups in PS1 and PS3, and the advanced group was less disappointed than the others in PS3. The intermediate group was less disappointed than the others in PS1. While the other groups showed the same or a decreased level of disappointment between stages, the intermediate group became more disappointed from PS1 to PS2. There were no significant differences among the ELL level groups at each stage or between stages within each ELL level group in the biology classes. The advanced group in the theme class did not exhibit a significant difference in disappointment when compared with the advanced group in the biology classes at each stage (Figure 6).

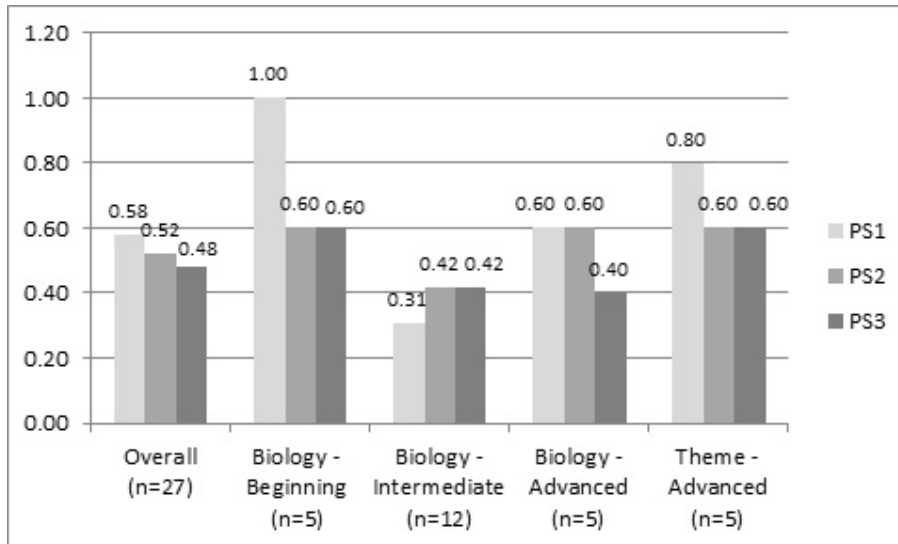


Figure 6. Disappointment by ELL level and class (n=27).

Frustration

Students became less frustrated as they progressed in the research project. The students' frustration stayed between "0=not at all" and "1=a little" throughout the research process. There was a significant decrease in frustration: PS1–PS3, $t(23) = 2.387$, $p < .05$ (Figure 7). When students were asked about reasons for their feeling, they reported:

"[I feel frustrated] because there are some words that I don't understand." (s8, PS1)

"When I can't find college or universities that matches with me I feel frustrated, but I feel good too because I'm doing a project that is going to change my life." (s5, PS2)

"... because I don't really like doing projects." (s35, PS2)

"... because I didn't really finish all my project." (s4, PS3)

The beginning group in the biology classes was more frustrated than the other groups throughout the research process. The advanced group in the biology classes maintained the same level of frustration throughout the research project. There were no significant differences in frustration at each stage among the ELL level groups or between stages within each ELL level group. The advanced group in the theme class became less frustrated throughout the research process. However, the decreases were not significant. At each stage, the advanced groups in the biology classes and the theme class did not differ significantly in their level of frustration (Figure 7).

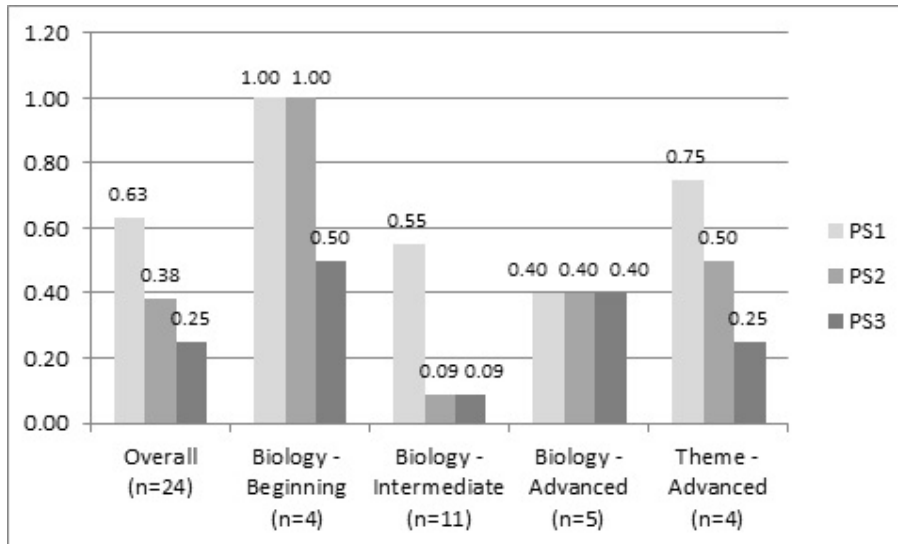


Figure 7. Frustration by ELL level and class (n=24).

Confusion

Students became less confused as they progressed in their research project. On average, they began research with “1=a little” confusion and became continuously less confused until completion. There were significant decreases in confusion: PS2–PS3, $t(26) = 3.075$, $p < .01$; and PS1–PS3, $t(26) = 3.017$, $p < .01$ (Figure 8). When students were asked about the reasons for their feeling, they reported:

“I don’t know too much about my career and that makes me confused.” (s3, PS1)

“I feel confused because I don’t know if I wanna do college here or in my country.” (s2, PS2)

“I have material but confused what to change from that.” (s20, PS2)

In the biology classes, the beginning group was more confused than the other groups in PS1 and PS3, whereas the advanced group was less confused than the other groups in PS1 and PS3. However, there were no significant differences in confusion among the ELL level groups in the biology classes. The intermediate and the advanced groups in the biology classes became more confused from PS1 to PS2. However, there were no significant differences in confusion between stages in each ELL level group of the biology classes (Figure 8).

The advanced group in the theme class became significantly less confused: PS1–PS3, $t(5) = 3.796$, $p < .05$. They were significantly more confused than the advanced group in the biology classes at PS1, $t(9) = 2.482$, $p < .05$ (Figure 8).

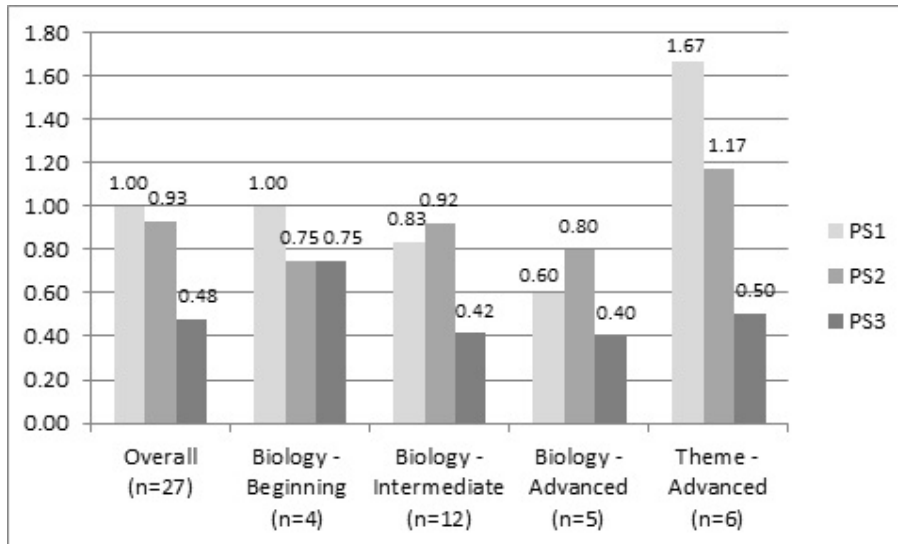


Figure 8. Confusion by ELL level and class (n=27).

Uncertainty

Students’ uncertainty stayed lower than “1=a little” throughout the research process, and the changes in uncertainty between stages were not significant (Figure 9). When students were asked about the reasons for their feeling, they reported:

“[I feel uncertain] because I really don’t know anything about this topic.” (s33, PS1)

In the biology classes, the beginning group exhibited a higher level of uncertainty than the other groups in PS1 and PS2, while the advanced ELL groups exhibited a lower level of uncertainty than the other groups in PS2 and PS3. The intermediate ELL group showed an increase of uncertainty in PS3. However, there were no significant differences in uncertainty among the ELL level groups or between stages within each ELL level group in the biology classes. The advanced ELL group in the theme class maintained the same level of uncertainty from PS1 to PS2. They showed an increase of uncertainty from PS2 to PS3; however, the difference was not significant. There were no significant differences in uncertainty between the advanced groups in the biology classes and the theme class (Figure 9).

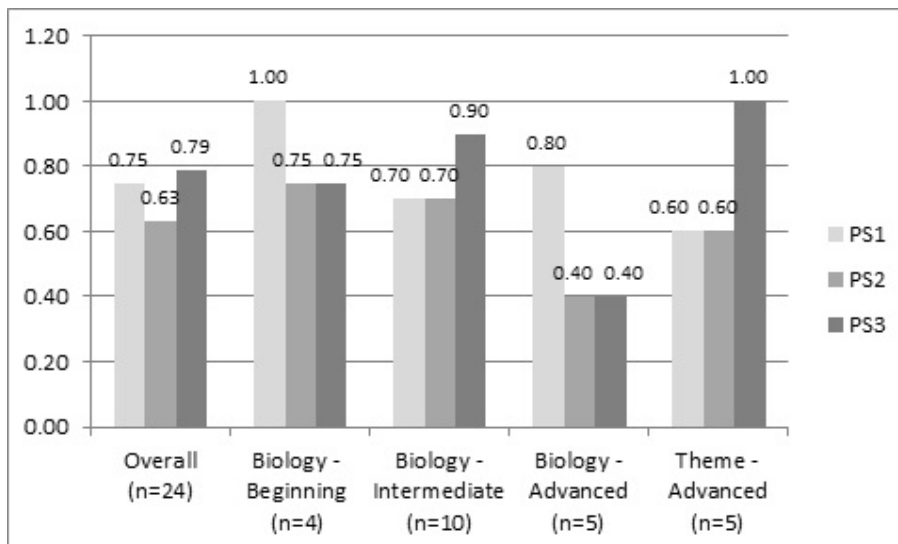


Figure 9. Uncertainty by ELL level and class (n=24).

Anxiety

The level of the students' overall anxiety decreased as they progressed in the research project; however, the decreases in anxiety were not significant. The students' anxiety stayed between "0=not at all" and "1=a little" throughout the research process (Figure 10). When students were asked about the reasons for their feeling, they reported:

"[I feel anxious] because I don't know a lot of my topic." (s12, PS1)

"... because it is a new project & a big project." (s20, PS1)

"... because this project is not easy." (s19, PS1)

"... because I want to get a good grade." (s37, PS2)

"... because I didn't find everything that I need." (s42, PS2)

In the biology classes, the beginning group exhibited a higher level of anxiety than the other groups in PS1, and the intermediate ELL group exhibited an increase of anxiety from PS2 to PS3. However, there were no significant differences in anxiety among the ELL level groups or between stages in each ELL level group of the biology classes. Students in the advanced ELL level in the theme class exhibited a non-significant increase of anxiety from PS1 to PS2. Their level of anxiety did not differ significantly from that of the advanced ELL group in the biology classes (Figure 10).

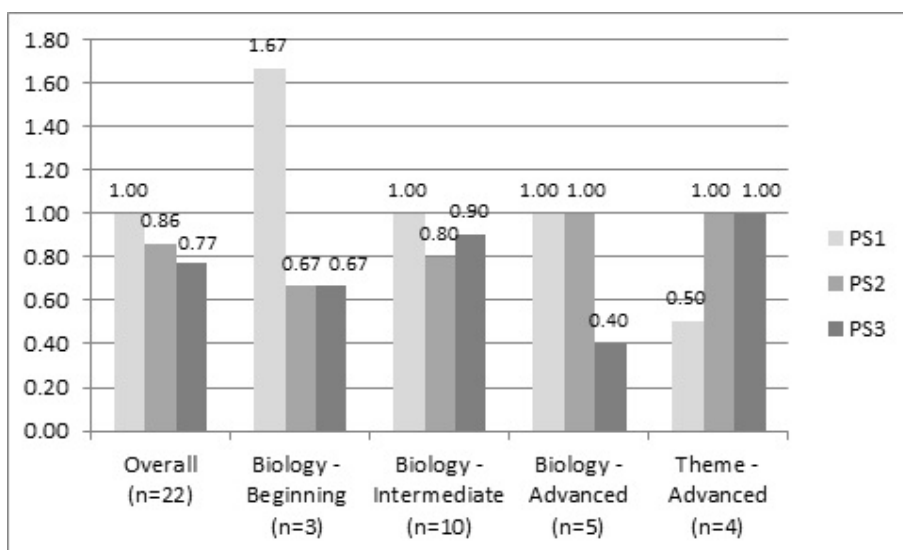


Figure 10. Anxiety by ELL level and class (n=22).

Concern about English Language Proficiency

The level of students' concern about their English language proficiency slightly increased from PS1 to PS2, but stayed the same in PS3. The changes in their concern about their English language proficiency between stages were not significant during the research process (Figure 11).

Students were concerned that their lack of English proficiency would affect their grades for the research project. Most students thought their lack of English proficiency impacted their research project in terms of the quality of the final product and the research process. Students listed several reasons why they believed they could have done better if they had completed the research project in their native language. First, they have more knowledge about the topic in their native language. Second, they can produce a more detailed and precise work in their native language. In addition, students listed the following reasons why they believed that the research process would have been

easier if they had completed the project in their native language. First, their vocabulary in their native language is much larger. Second, it is easier for them to search for information in their native language than in English. Third, the research process would have been faster.

In the biology classes, the intermediate group had less concern about their English language proficiency than the other groups throughout the research process. The beginning ELL group had more concern about their English language proficiency than the other groups in PS1 and PS3. However, there were no significant differences among the ELL level groups or between stages in each ELL level group. The advanced group in the theme class showed an increase in concern about English language proficiency from PS1 to PS2 and showed a decrease from PS2 to PS3. However, there were no significant changes between stages, and they had no significant differences from the advanced ELL group in the theme class (Figure 11).

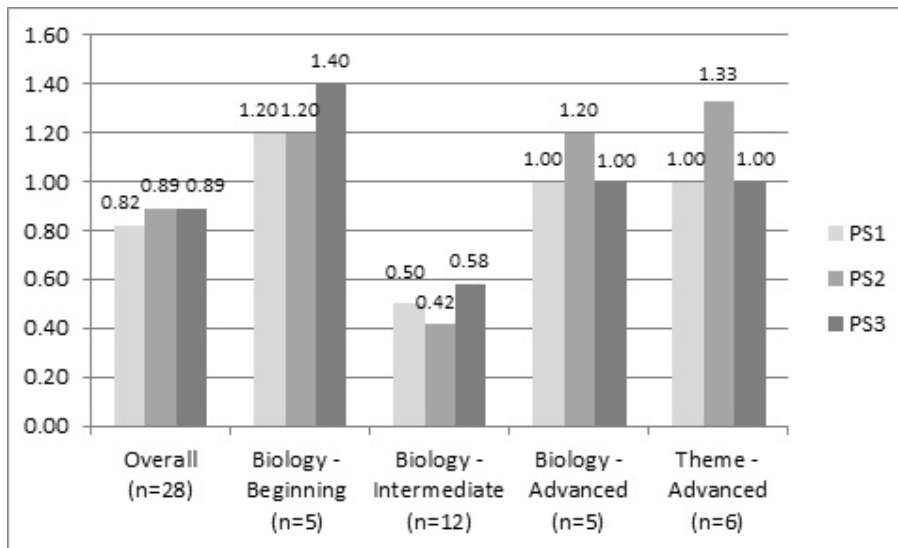


Figure 11. Concern about English Language Proficiency (n=28).

Discussion

Emotional changes of ELLs

With all participants included, the students became significantly more relieved (PS1–PS2; PS1–PS3) and satisfied (PS2–PS3; PS1–PS3) and less frustrated (PS1–PS3) and confused (PS2–PS3; PS1–PS3) as they progressed in the research process. It supports the findings of previous ISP studies that did not particularly focus on ELL populations (Kuhlthau, 2004; Kuhlthau, Heinström & Todd, 2008). However, there were no significant changes found in confidence, optimism, disappointment, uncertainty, anxiety, and concern about English language proficiency over the stages.

English language proficiency

Among the three ELL level groups in the biology classes, only the intermediate group showed significant increases in positive feelings, particularly in relief (PS1–PS3) and satisfaction (PS2–PS3; PS1–PS3). Also, it is worthwhile to remark that the advanced group showed continuous decreases in optimism and satisfaction throughout the research process, although the differences were not significant. None of the ELL level groups showed significant changes in negative feelings between

stages. These findings are different from those of Ellis's (2008) study where all three different ELL groups showed increases in positive feelings by the end of the project.

When the ELL level groups were compared at each stage, there were no significant differences. However, some interesting patterns were found. For instance, the advanced group started the research project with a higher level in all four positive feelings – confidence, relief, optimism, and satisfaction – than the other groups, whereas the intermediate group completed the research project with a higher level in all four positive feelings than the others. Different from this, Ellis (2008) found that the advanced group was least confident and the intermediate group was most confident in the beginning stage.

On average, the beginning group exhibited a lower level of confidence and relief than the other groups throughout the research process. Furthermore, the beginning group started the research project with a higher level in all six negative feelings – disappointment, frustration, confusion, uncertainty, anxiety, and concern about English language proficiency – than the other groups, which supports the findings of Ellis's (2008) study where the beginning group started the project with higher levels of frustration and uncertainty than the others. They were more frustrated than the other groups throughout the research process. The intermediate group was less concerned about their English language proficiency than the other groups throughout the research process.

Previous studies have found the relationships between cognition and emotion that people experience during their information-seeking process (Kuhlthau, 2004; Tenopir, Wang, Zhang, Simmons & Pollard, 2008). This study also shows that students' emotional changes are associated with their cognition that is reported in another article (Kim, 2015b). For instance, the intermediate group was the only one showing significant increases in topical knowledge and estimate of knowledge (Kim, 2015b). With respect to emotion, they were the only group showing significant increases in positive feelings, were less concerned about their English language proficiency than the others throughout the research process, and completed the research project with a higher level in all positive feelings than the others. Another pattern noticed was that the advanced group initiated the research project with a higher level of estimated knowledge and positive feelings than the other groups. However, their increase in estimated knowledge was surpassed by the intermediate group in PS2, and their positive feelings decreased or fluctuated while the intermediate group showed stable increases.

Nature of Research Task

The advanced groups in the biology classes and the theme class did not show significant differences in positive feelings between stages or between each other at the same stage, whereas there were differences found in negative feelings between the two groups. At PS1, students in the theme class, who were involved in a more intensive research project with a personal topic, were significantly more confused than those undertaking a less intensive research project with a biology topic. However, they showed a significant decrease in confusion between PS1 and PS3 with structured instruction on research steps. This implies that systematic interventions in a research project will reduce students' initial confusion and allow them to more effectively build their knowledge. Also, students in the theme class differed from those in the biology classes in that they showed continuous increases in all positive feelings except that their level of confidence stayed the same between PS2 and PS3.

These findings on affective dimension seem to be related to those on cognitive aspect. According to Kim's (2015b) article, students in the theme class showed significant increases in the

amount of topical knowledge and estimated knowledge, which is different from those in the biology class. Also, they exhibited significantly more topical knowledge than those in the biology class in PS3. As Kim (2015b) pointed out, the differences may be because (a) the advanced students in the theme class were involved in a more intensive research task, whereas those in the biology class were performing a task which may have been too easy, with classmates who had a lower English language proficiency; (b) students in the theme class had more structured interventions and regular feedback than those in the biology classes, during the research process; (c) different from students in the biology classes, those in the theme class worked on a personalized topic. In the theme class, students' feelings changed a lot throughout the research process because the topic was about their life decision, which required them to learn about systems in the United States and consider things around them in reality. The research project in the theme class made students seriously think about whether they would stay in the United States or go back to their own country, which might explain why some of the students got more uncertain and anxious as they progressed. Because of the topic, their personal lives and situation influenced how they felt during the research project.

Conclusion

Framed with Kuhlthau's ISP, this study examined emotional changes that ELL students experienced during their information-seeking process and how the emotional changes differ by the students' English language proficiency and the nature of research task. The results indicate that ELL students, as a whole group, became significantly more relieved and satisfied and less frustrated and confused as they progressed in the research project. When three different ELL level groups were compared, only the intermediate group showed significant increases in positive feelings, particularly in relief and satisfaction. In addition, students who received systematic interventions during the research process showed less confusion in the initiation than those who had few interventions. When the research topic was about students' life decision, their personal lives and situation influenced their feelings during the research project.

Although the natural setting of this study allowed reflection on the curriculum and school environments where ELL students were situated in reality, the case study approach with a relatively small number of participants from one high school gives limitations to interpretations and generalizations of the findings. Also, it should be noted that this study showed potential differences in emotion that varied according to level of English proficiency; however, in spite of some repeated patterns by ELL level, these differences were rarely statistically significant. It might be because there was a small group of participants in this study, and four point scales were not sophisticated enough for ELL students to reflect their changes in feelings. To see clearer differences in affective changes among the ELL level groups, scales with more response categories can be employed with a larger group of participants in future studies.

References

- Battle, J. C. (2004). The effect of information literacy instruction on library anxiety among international students. *ProQuest Dissertations and Theses database*. (UMI No. 3126554)
- Bilal, D. (2005). Children's information seeking and the design of digital interfaces in the affective paradigm. *Library Trends*, 54(2), 197-208.
- Ellis, M. (2008). Task-based information seeking as a constructive process: A study of Chinese ESL students (Unpublished doctoral dissertation). Nanyang Technological University, Singapore.

- Gwizdka, J., & Lopatovska, I. (2009). The role of subjective factors in the information search process. *Journal of the American Society for Information Science and Technology*, 60(12), 2452-2464.
- Jiao, Q. G., & Onwuegbuzie, A. J. (1997). Antecedents of library anxiety. *Library Quarterly*, 67, 372-389.
- Jiao, Q. G., Onwuegbuzie, A. J., & Lichtenstein, A. (1996). Library anxiety: Characteristics of 'at-risk' college students. *Library & Information Science Research*, 18, 151-163.
- Kim, S. U. (2015a). Enablers and inhibitors to English language learners' research process in a high school setting. *School Library Research*, 18. Available at <http://www.ala.org/aasl/slr/volume18/kim>
- Kim, S. U. (2015b). Exploring the knowledge development process of English language learners at a high school: How do English language proficiency and the nature of research task influence student learning? *Journal of the Association for Information Science and Technology (JASIS&T)*, 66(1), 128-143.
- Kim, S. U., & Todd, R. (2008). The information search process of English Language Learner (ELL) students in a Guided Inquiry Project: An in-depth case study of two Korean high school students in the United States. *Proceedings of the 37th Annual Conference of the International Association of School Librarianship (IASL)*, University of California at Berkeley, California, Aug 3-7, 2008.
- Kort, B., Reilly, R., & Picard, R. W. (2001). An affective model of interplay between emotions and learning: Reengineering educational pedagogy – building a learning companion. *Proceedings of the Second IEEE International Conference on Advanced Learning Technologies (ICALT'01)*, 43-48.
- Kracker, J. (2002). Research anxiety and students' perceptions of research: An experiment. Part I. Effect of teaching Kuhlthau's ISP model. *Journal of the American Society for Information Science and Technology*, 53(4), 282-294.
- Kracker, J., & Wang, P. (2002). Research anxiety and students' perceptions of research: An experiment. Part II. Content analysis of their writings on two experiences. *Journal of the American Society for Information Science and Technology*, 53(4), 295-307.
- Kuhlthau, C. C. (1983). The library research process: Case studies and interventions with high school seniors in advanced placement English classes using Kelly's theory of constructs (Unpublished doctoral dissertation). Rutgers University, New Brunswick, NJ.
- Kuhlthau, C. C. (1988a). Longitudinal case studies of the information search process of users in libraries. *Library and Information Science Research*, 10(3), 257-304.
- Kuhlthau, C. C. (1988b). Meeting the information needs of children and young adults: Basing library media programs on developmental states. *Journal of Youth Services in Libraries*, 2(1), 51-57.
- Kuhlthau, C. C. (1989). The information search process of high-, middle-, and low-achieving high school seniors. *School Library Media Quarterly*, 17(4), 224-226.
- Kuhlthau, C. C. (1991). Inside the search process: Information seeking from the user's perspective. *Journal of the American Society for Information Science*, 42(5), 361-371.
- Kuhlthau, C. C. (1993). A principle of uncertainty for information seeking. *Journal of Documentation*, 49(4), 339-355.
- Kuhlthau, C. C. (2004). *Seeking Meaning: A Process Approach to Library and Information Services* (2nd ed.). Westport, CT: Libraries Unlimited.
- Kuhlthau, C. C., Turock, B. J., George, M. W., & Belvin, R. J. (1990). Validating a model of the search process: A comparison of academic, public and school library users. *Library and Information Science Research*, 12(1), 5-31.
- Kuhlthau, C. C., Heinström, J. & Todd, R.J. (2008). The 'information search process' revisited: Is the model still useful? *Information Research*, 13(4). Available at <http://InformationR.net/ir/13-4/paper355.html>
- Kwon, N., Onwuegbuzie, A. J., & Alexander, L. (2007). Critical thinking disposition and library anxiety: Affective domains on the space of information seeking and use in academic libraries. *College & Research Libraries*, 68, 268-278.
- Lopatovska, I. (2014). Toward a model of emotions and mood in the online information search process. *Journal of the Association for Information Science and Technology*, 65(9), 1775-1793.
- National Council of Teachers of English (NCTE). 2008. English language learners. Available at <http://www.ncte.org/library/NCTEFiles/Resources/Positions/Chron0308PolicyBrief.pdf>

- Onwuegbuzie, A. J. (1997). Writing a research proposal: The role of library anxiety, statistics anxiety, and composition anxiety. *Library & Information Science Research, 19*, 5-33.
- Onwuegbuzie, A. J., & Jiao, Q. G. (2004). Information search performance and research achievement: An empirical test of the Anxiety-Expectation Mediation model of library anxiety. *Journal of the American Society for Information Science and Technology, 55*(1), 41-54.
- Tenopir, C., Wang, P., Zhang, Y., Simmons, B., & Pollard, R. (2008). Academic users' interactions with ScienceDirect in search tasks: Affective and cognitive behaviors. *Information Processing and Management, 44*(1), 105-121.
- Todd, R. J., Kuhlthau, C. C., & Heinström, J. E. (2005). *School Library Impact Measure (SLIM): A toolkit and handbook for tracking and assessing student learning outcomes of guided inquiry through the school library*. New Brunswick, NJ: Center for International Scholarship in School Libraries, Rutgers University. Available at <http://cisssl.rutgers.edu/images/stories/docs/slimtoolkit.pdf>
- Wang, P. Hawk, W. B., & Tenopir, C. (2000). Users' interaction with World Wide Web resources: An exploratory study using a holistic approach. *Information Processing & Management, 36*, 229-251.
- WIDA Consortium. (2013). ACCESS for ELLs: Interpretive guide for score reports. Available at <http://wida.us/get.aspx?id=25>
- Wilson, T. D., Ford, N., Ellis, D., Foster, A., & Spink, A. (2002). Information seeking and mediated searching. Part 2. Uncertainty and its correlates. *Journal of the American Society for Information Science and Technology, 53*(9), 704-715.

Author Note

Sung Un Kim is an Assistant Professor in the Department of Library and Information Science at the Catholic University of America where she has been leading the School Library Media program. Her research interests include information services for linguistically and culturally diverse students, young adults' information literacy skills and information-seeking behaviors, and instructional technologies. She can be contacted at KIMI@cua.edu.