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An Attitude Scale for the Information Search Process (ASISP): A Study of Reliability and Validity[*]

Bilgi Arama Süreci Tutum Ölçeği (BASTÖ): Güvenirlik ve Geçerlik Çalışması[**]

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Abstract

The main aim of this study is to develop a valid and reliable measurement tool, which can reveal the attitudes of undergraduate students regarding the Information Search Process (ISP). Internal consistency and reliability computed with Cronbach Alpha (n=374) and test-retest. Construct validity was calculated through factor analyses, Exploratory Factor Analysis - EFA (n=883), and Confirmatory Factor Analysis-CFA (n=200). Additionally, varimax rotation, item-total correlations, and interdimensional correlations were conducted. After conducting these tests reliable and valid attitude scale, Attitude Scale for the Information Search Process (ASISP) with a total of 46 items, and a five-dimensional structure measuring individuals' attitudes toward ISP was finalized. Thus, ASISP is constituted by, "task initiation," "topic selection process," "defining focused topic", "information collection and search closure," and the "skills of research methodology" dimensions. The results of the study support the idea that the ISP is culture depended.

Keywords: *Information search process; attitude; attitude scale; reliability and validity; undergraduates.*

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Öz

Bu çalışmanın temel amacı, lisans öğrencilerinin "Bilgi Arama Süreci" (BAS) ile ilgili tutumlarını ortaya çıkarabilecek geçerli ve güvenilir bir ölçme aracı geliştirmektir. İç tutarlılık ve güvenirliğini belirlemek için Cronbach Alpha (n=374) ve test- tekrar test düzeyleri hesaplanmıştır. Ölçeğin yapı geçerliği Açımlayıcı (n=883) ve Doğrulayıcı (n=200) faktör analizleri ile hesaplanmıştır. Ayrıca, varimax rotasyonu, madde-toplam korelasyonları ve boyutlararası korelasyon hesaplamaları yapılmıştır. Bu hesaplamalar sonucunda, beş boyut ve 46 maddeden oluşan Bilgi Arama Süreci Tutum Ölçeğinin (BASTÖ), bireylerin BAS'a ilişkin tutumlarını belirlemek üzere kullanılabilecek güvenilir ve geçerli bir araç elde edilmiştir. Böylelikle BASTÖ, "Başlama", "Konu seçim süreci", "Odak konunun belirlenmesi", "Bilgi toplama ve tamamlama" ve "Araştırma yöntemi becerileri" boyutlarından oluşmaktadır. Bu çalışmanın sonuçlarının BAS'ın kültüre bağlı olduğu düşüncesini desteklediği söylenebilir.

Anahtar kelimeler: *Bilgi arama süreci; tutum; tutum ölçeği; güvenirlik ve geçerlik; lisans öğrencileri.*

Introduction

In the 21st century, it is crucially important for undergraduate students to be learners not only in their academic life but also in their work-life after graduation. They need to become lifelong learners, that they gain high order information seeking (IS). IS includes skills such as being aware of their information needs, finding, analyzing, synthesizing the information they need, writing in line with the scientific and ethical principles and presenting what they write in various settings, critical thinking and problem solving (Bentley, Robinson, & Ruscitti, 2015; Çakmak, 2016; FitzGerald, 2016; Manarin, McGrath, & Carey, 2016). However, for most undergraduate students, information seeking is a quite complicated and challenging process. IS experience of the students are affected by many internal factors including feelings, thinking, individual characteristics (George, 2008; Kuhlthau, 1996; Nahl, 1997), and attitudes (Çakmak, 2016).

Attitudes determine an individual's response to a person, group, object, or phenomenon/event, called the target object in the study (Ajzen, 2005). Tripartite framework which was firstly suggested by McGuire (1969) and accepted by many researchers (Kelvin, 1970; Cacioppo, Petty, & Geen, 1989; Aronson, Wilson, & Akert, 2013) and the researchers of the present study assumes that an attitude to a target object is constituted by three dimensions, cognitive, affective, and behavior. For example, Item 11 (I feel relieved…) is an effective one dealing with individual's feelings; Item 7 (I do not know…) deals with individual's cognitive elements; Item 28 (I use my time well…) deals with behavioral features. On the other hand, Kuhlthau (1996, pp. 41-42) stated cognitive, affective, and physical aspects, but she did not mention them as attitudes, this discussion can be found in the Significance section.

Attitudes have a strong positive or negative influence on an individual's beliefs, thoughts, and actions (Bohner & Wänke, 2002; Bohner & Dickel, 2011). Attitude is learned by experience, drives an individual to a particular behavior and the behavior may continue on a positive or negative way consistently toward the attitude's object (Ajzen, 2005). Strong attitudes developed toward the attitude object are harder to change than weak attitudes. They are resistant to change, become stable/settle in, and particularly have a negative impact on cognition and action (How & Krosnick, 2017, pp. 328-329).

Even though students receive classes on information access, scientific research methods, academic paper writing, library user training throughout their undergraduate study, they are observed to have difficulty in IS. The authors' such experiences about the students lead to think that persistency on unfavorable behaviors may be resulting from their strong and negative attitudes toward IS. Moreover, unfavorable attitudes toward IS may negatively influence their future work and social life, particularly those who put prominence on research. Thus, the present

study focused on undergraduate students' attitudes toward IS. Regarding an attitude study, the preliminary step is to understand, and thus to measure attitudes.

The present study aimed to construct a valid and reliable instrument revealing undergraduate students' attitudes toward ISP. The instrument could be used to measure the attitudes periodically and to find the effects of any intervention or factor. The instrument can be used to make correlation studies such as the correlation between students' academic performance and attitudes. Moreover, the scale can be used to find the correlation between attitudes and the anxieties of IS; attitudes and information literacy self-efficacy. Similar correlation studies can be done utilizing different scales of self-concept, attitude toward educational research writing, research can also be found relating more than two variables.

The ASISP can be utilized to reveal if there are significant differences among different cultures, grade levels, gender, age, etc. Thus deeper understanding of students would enable new research and proper library education programs.

Measuring Attitudes

When we want to understand someone's attitude to an object, it is not always possible to conclude by direct observations because; attitudes are hidden or implicit variables (Bohner & Wänke, 2002; Schwarz, 2008). Therefore, we can reveal, measure, or understand it by using certain techniques. In order to explore and better understand undergraduate students' attitudes toward information search processes, Likert's (1967, 2008) "Total Rating Scale" was used in this study. Therefore, the authors developed an Attitude Scale for the Information Search Process - ASISP to explore the undergraduate students' attitudes toward ISP.

Present researchers preferred to adopt Kuhlthau's (1983, 1996) six-stage Information Search Process (ISP) model while preparing ASISP. Kuhlthau's ISP model provided a theoretical basis for several studies. It investigates individuals' thoughts, feelings, actions about ISP from a holistic perspective, has been tested on different study groups in long-term research, and its validity has been confirmed.

ASISP may offer a significant contribution to librarians and educators in identifying undergraduate students' existing positive and negative attitudes toward ISP and better understanding their strengths and weaknesses related to the process stages. Also, ASISP may be used as a worthwhile guide for developing, planning or structuring information literacy, library literacy, user training, and scientific research processes and research methods course programs and curriculum that can support the improvement of IS and library literacy skills, academic performance and information-seeking self-efficacy. Furthermore, the scale may offer a significant contribution to other information-seeking studies in LIS field, especially the studies investigating the affective factors regarding information seeking processes, and provide a different perspective to such studies in respect of attitude toward affective factors.

Theoretical Background

Information Seeking and Information Search Process

Information seeking continues to maintain its importance since the early 1900s in LIS. Early research of information seeking considers mostly the utilization of the library instead of users (Savolainen, 2009, p. 189). Research regarding information seeking accelerated after the 1960s but continued traditionally until mid-1980s. In other words, research in this period focused on the system rather than individual (Ingwersen & Järvelin, 2005). Nevertheless, information seeking research in the mid-1980s evolved to new perspectives; the focus shifted from the system to the individuals. Dervin and Nilan's study "Information needs and uses" in 1986 is a benchmark showing the shift (Ingwersen & Järvelin, 2005, p. 55). Access to the Kuhlthau's

studies (1983, 1991, 1996) regarding information search processes in the arena shifted the focus to individuals' interior characteristics such as thinking, feeling, and action. Additionally, these three factors were comprehensively considered and analyzed by Kuhlthau for the first time (Cheng, 2004; Çakmak, 2016; Savolainen, 2015b).

Throughout the literature the information-seeking concept is defined focusing on different aspects of the process including phrases such as purposeful act (Vakkari, 1999); information requirement (Case & Given, 2016; Rouse & Rouse, 1984); solving problems (Hyldegård, 2006; Rouse & Rouse, 1984); a process (Barranoik, 2004; George, 2008; Kuhlthau, 1983) and a learning process (Kuhlthau, 1996; Marchionini, 1989; Rieh, Collins-Thompson, Hensen, & Lee, 2016). The common aspects are emerged as that the information search is a process and constituted of repeated activities and steps (Çakmak, 2016).

In the literature on LIS, the ISP has been addressed in two ways; linearly (conventional) and non-linearly. According to the conventional approach, the ISP progresses sequentially, from topic selection to writing the assignment (Hook & Graver, 1962). For the first time, Kuhlthau pointed out that the ISP does not progress in the sequential form emphasized by the conventional approach, and she indicated that the search for information is a much more complex process which has as many mental (conceptual - cognitive) aspects as it does psychological ones (Burdick, 1995; Cheng, 2004, Çakmak, 2016). According to Kuhlthau (1983, 1988, 1996), the main feature of any process is that it extends over time, and the process of searching for information cannot be separated from this. Within this period, the ISP can be influenced by the individual's thoughts, feelings, behavioral traits, and learning styles. After Kuhlthau, many researchers have addressed and reviewed the ISP differently from the conventional approach (e.g. Barranoik, 2004; Çakmak, 2016; Marchionini, 1989; Rouse & Rouse, 1984; Yoon & Nilan, 1999).

Kuhlthau's ISP Model

Several models developed for information search also have described the importance and role of the affective factors such as doubt, anxiety, fear in individuals'/users' information-seeking experiences (Kuhlthau, 1983, 1996; Nahl, 1997; Wilson, 1999). Among these models, Kuhlthau's ISP model is the first model that draws attention to the importance of affective factors in information search (Case & Given, 2016; Savolainen, 2015a). Kuhlthau's model has revealed that thoughts and actions, as well as affective factors, influence the ISP.

In early 1980s Kuhlthau in her doctoral thesis researched factors of information seeking, namely thought, feeling, and action in a comprehensive way (1983, 1996; Savolainen, 2015b). Kuhlthau's thesis (1983) was her preliminary study, which enables her to develop a model for ISP. Kuhlthau observed high school students working on their projects and related students' research experiences with constructivist learning processes. According to Kuhlthau, students behave similarly during their research. Almost all of the students felt confusion and anxiety in the first steps of the research projects, just like what is felt in constructivist learning processes. In the next steps of the process, depending on their experiences, uncertainty yield to certainty and anxiety to confidence. Her observations, thus, directed Kuhlthau to utilize constructivist theories during developing her ISP model (2007, p. 32). In this sense, Kuhlthau's ISP model emerges from George A. Kelly "Personal Construct Theory" (Kuhlthau, 1983, 1996). Adding while developing her ISP model Kuhlthau was also affected by theories of John Dewey and Jerome Bruner; Belkin, Oddy, and Brooks ASK model and Taylor "Information Need" model (Kuhlthau, 1991, 1996). Thus, Kuhlthau revealed that students' information-seeking not only constituted by information gathering and reporting but, constituted by more complex constructivist processes, thinking, feeling and action (Kuhlthau, Heinström, & Todd, 2008).

The ISP model is constituted by,

1) *Task Initiation-TI:* The information requirements are identified. At this stage, when individuals begin to become aware of their lack of information, they feel a sense of uncertainty and anxiety.
2) *Topic selection-TS:* The main research topic for the assignment or project, and the approach which will be followed is determined. Anxiety increases if the topic is not selected quickly. When the main topic is selected, negative feelings such as uncertainty and anxiety are replaced by positive once.
3) *Pre-focus Exploration-PE:* Research is undertaken in order to determine a potential narrowing of the main topic. For many people, this is the hardest step of the process. Feelings predominantly felt during this process are confusion, frustration, and doubt.
4) *Focus Formulation-FF:* Different aspects of the main topic are condensed into a single focus. For many people, focus formulation is the turning point of the research process: it is where the feeling of uncertainty decreases, and where confidence increases.
5) *Information Collection-IC:* Information about the focus topic is gathered. The main idea at this stage is to obtain descriptive and supportive knowledge. At this stage, as uncertainty diminishes, the sense of confidence continues to increase.
6) *Search Closure-SC*: In this last stage of the research process, a feeling of relaxation is most common. If research went well, a sense of satisfaction would arise, and if it went badly, a sense of disappointment. The task at this stage is to complete the research and prepare it for presentation or use the results in various ways (Kuhlthau, 1991, 1996, 2007).

The ISP model was tested and proved starting late 1980s and continued 15 years via a longitudinal case studies considering a wide range of sampling (high school, college and adult public library users) and various library types (academic, public and school) utilizing quantitative and in-depth qualitative research (Kuhlthau, 1988, 1996; Kuhlthau, Turock, George, & Belvin, 1990; Kuhlthau et al., 2008). These studies showed that users' behaviors of these three different types of libraries do not differ from each other. Thus, the model can be forwarded to explain not only the high school students' ISP but also the other processes as well (Çakmak, 2016). The model was used as a base in many experimental studies by many researchers (Cheng, 2004; Hyldegård, 2006; Kracker, 2002; Kracker & Wang, 2002; Nahl, 1997; Peterson, 2008) and has provided a useful framework for them. In their research in 2008, Kuhlthau and her colleagues tested the model to see if it is still useful for users regarding the theoretical and explanatory framework. Kuhlthau et al. (2008) showed that it could be used as a theoretical framework for many studies regarding subjects such as digital environment, information retrieval systems, relevance judgments, adult information seeking in work and everyday life, and educational contexts. Literature concerning LIS after the year 2008 showed that the model still presents a basic theoretical background for research regarding undergraduates' (Hendahewa & Shah, 2017; Krubu, Zinn, & Hart, 2017; Wu, Dang, He, & Bi, 2017), middle school students' (Beheshti, Cole, Abuhimed, & Lamoureux, 2015; Cole, Beheshti, & Abuhimed, 2017; Cole, Beheshti, Abuhimed, & Lamoureux, 2015), graduates' (Al-Samarraie, Eldenfria, & Dawoud, 2017), information seeking, ISP, information-seeking behaviour, information retrieval and critical thinking practices; in higher education sector, academicians', researchers' and students' uncertainty in information seeking and retrieval (Chowdhury, Gibb, & Landoni, 2011). Affective factors of information seeking (Savolainen, 2015a) and relevance criteria (Taylor, 2012) were studied as well.

Literature Review

There is a lack of research dealing with attitudes toward ISP. Researchers put prominence on attitudes to interpret students research related behaviors and recommend precautions for

improvement. Research included attitudes toward research (Geffert & Christensen, 1998; Klentzin, 2010; Papanastasiou, 2005, 2014; Van der Westhuizen, 2015; Opara & Ekeh, 2017; Kyaw Soe et al., 2018) and research anxiety (Büyüköztürk, 1997; Erfanmanesh, 2016; Erfanmanesh et al., 2012; Naveed, 2017; Naveed & Ameen, 2016).

Studying university students Geffert and Christensen (1998, p. 279) stated the importance of finding attitudes toward research and the libraries for bibliography teaching and counseling services.

Klentzin (2010) studied first-year university students' attitudes toward secondary research process by two open-ended questions: Do you like to conduct research? Why or why not? (Klentzin, 2010, p. 560). About 1/3 of the students were found to dislike research, while half of them have mixed attitudes. One student in favor of secondary research stated that; ***"It helps me expand my knowledge about certain material."***

On the other hand, one other student stated that ***"[Research is] time consuming and [it is] difficult to find sources that mirror my points and opinions."*** These two contradicting responses can be interpreted as the attitudes toward research can direct individuals either to conduct research or stay away from it. Thus, Klentzin (2010) stated the importance of revealing attitudes. Taking students in the center and being aware of their attitudes would enable to construct more successful programs.

Research showed that attitudes toward research prevented learning and lowered student success (Papanastasiou, 2005, p. 16). Papanastasiou (2005, pp. 21-22), worked with education undergraduate students using a scale of Attitude Toward Research (ATR) and found that students think that the research is useful for their both professional and personal lives, but they have anxieties and negative attitudes to research. Papanastasiou offered educators to use ATR for better learning. Similarly, Van der Westhuizen (2015) research attitudes to research and finalized that students find research challenging, and they have moderate anxiety regarding research. However, the research also showed that students have positive attitudes toward research, and they find research beneficiary. Van der Westhuizen interpreted that the students intend to learn more about their profession and reserve more time for related research.

Kyaw Soe et al. (2018) researched research-related knowledge, attitude, and barriers taking undergraduate medical and dental students. They concluded that most students have moderate knowledge and attitude to the research of these most stated barriers of knowledge, funding, and facilities. Regarding effective aspect, most students (56%) stated the lack of rewards. They suggested ideas to overcome barriers for improvement. Similarly, Opara and Ekeh (2017) studying undergraduate education faculty students tried to find the influence of different variables on research writing. They found that self-concept, anxiety, and achievement motivation influenced research writing significantly. They again recommended depending on the findings to enhance research writing.

Some other research tried to reveal the differences between different program levels. Büyüköztürk (1997) found that there is a significant difference between undergraduate and graduate students' anxieties to research. They found that graduate students have fewer anxieties than their counterparts do. He explained the difference to more method related courses the graduates took than the undergraduates. Büyüköztürk stated the importance of taking precautions in both groups for research anxiety. He put importance for individualized teaching to overcome the problem. Similarly, Erfanmanesh (2016) found that Ph.D. students have lower information seeking anxiety than master students. Erfanmanesh (2016, p. 14) explained the reason based on more experiences of Ph.D. students such as searching topics for research, and writing a research proposal.

Studying with postgraduates Naveed and Ameen (2016) revealed that students have anxieties of information seeking processes. They concluded that their study would guide

reference and research services and information professionals and be used in developing information literate curriculum.

The following paragraph will shortly introduce research dealing with affective factors. These researches did not consider attitudes comprehensively and directly. They included them as interior factors. In this context there are many research dealing with internal factors of information seeking processes, research performance, and academic success in terms of uncertainty (Kuhlthau, 1996; Chowdhury et al., 2011; Savolainen, 2015b; Haley & Clough, 2017), confusion, doubt, frustration, curiosity, optimism, interest, confidence, satisfaction (Kuhlthau, 1996; Chowdhury et al., 2011; Savolainen, 2015b; Haley, & Clough, 2017; Orlu, Mafo, & Tochukwu, 2017). For example, research dealt with uncertainty, and the researchers stated that uncertainty in ISP causes negative feelings such as confusion, doubt, frustration, anxiety, and lack of confidence and limits information retrieval (Kuhlthau, 1996). Contradicting, some others stated that uncertainty causes increased motivation and interest (Anderson, Bates, Berryman, Erdelez, & Heinstrom, 2006; Wilson, Ford, Ellis, Foster, & Spink, 2002). Chowdhury et al. (2011) found that academic staff, research staff, and research students have different levels of uncertainty about information-seeking activities, which inhibits finding new sources. On the other hand, Zhou (2013) stated that positive feelings help students develop cognitive skills such as critical or creative thinking, problem-solving, analyzing, synthesizing and evaluating knowledge, and choosing search strategies. Contradicting, negative feelings can lead to lack of attention in students during the ISP and can lead to superficial treatments by the student. Moreover, they may cause students to give up on their assignment (Peterson, 2008). Adopting Kuhlthau's ISP model, Kracker (2002) and Kracker and Wang (2002), applied a 30 minutes program to teach students the stages of ISP. They concluded that the education model lowers students' research anxieties. Byron and Young (2000) studying with undergraduate and graduate students and Beheshti et al. (2015) working with eight grade students. The researchers tried to find a change in students' feelings, thoughts, and actions while doing projects, depending on Kulthau's ISP model. Although these studies are important in revealing students' cognitive, positive and negative emotions (feelings) and actions, both did not target to find attitudes toward ISP or did not tried to develop an attitude scale.

There is a lack of research measuring ISP attitudes, particularly. Similar to the other research, before mentioned, scale development studies considered attitudes toward research (Korkmaz, Şahin, & Yeşil, 2011; Papanastasiou, 2005, 2014; Van der Westhuizen, 2015) and research anxieties (Büyüköztürk, 1997; Erfanmanesh, 2016; Erfanmanesh et al., 2012; Naveed, 2017; Naveed & Ameen, 2016). Nevertheless, these research studies were used to develop the items of ASISP. This discussion can be found in the *Preparation of items and evaluation of the scale* (7. 2. four subtitles).

Significance

The researchers of the present study have the impression that undergraduate students have many challenges throughout the ISP. For example, the first author of the study, who was a librarian in the library of the Chamber of Architecture,[1] has been encountering such student problems. These challenges include lack of defining the research problem, lack strategies in using different sources, search only particular kind of sources (books), asking the librarian to find the sources for them, intend to use internet only, lack of persistence (stop seeking if they fail few times), and leave the area instead of asking to the librarian. Similarly, the other author faced with many student misunderstandings, and resistance to change writing habits. Depending on the research

[1] The first author was working in the Chamber of Architectue where she carried out one part of the study. Then she changed her work.

above and these experiences directed the authors of the present study to think that the reasons for these unwanted behaviors are sourced by attitudes. Thus the authors of the present study saw a need to develop an attitude scale trying to explain student thinking and behaviors. Moreover, revealing student attitudes toward the ISP would enhance the ISP.

As it is stated in the Introduction section models developed in the field of LIS examined internal factors affecting individual ISP in various ways (Çakmak & Baysen, 2013; Çakmak, 2016). However, when these models and other literature in the field of LIS are examined, it is noteworthy that there are no studies, which examine the attitudes, nor developing an attitude scale alongside the factors, which affect users' ISP. On the other hand, in other studies, we can say that attitudes have been partially addressed (even if they are not directly defined as attitude, but as affective factors, feeling, anxiety) regarding their effects on individuals' ISP (e. g. Cheng, 2004; Haley & Clough, 2017; Kracker, 2002; Kracker & Wang, 2002; Kuhlthau, 1983; Lopatovska & Arapakis, 2011; Peterson, 2008; Orlu et al., 2017; Savolainen, 2015a). Additionally, Kuhlthau's model does not directly examine users' attitudes toward ISP, in the affective factors dimension of the model, but there are important findings, which can be evaluated regarding attitude (Çakmak, 2016). Although Kuhlthau stated that attitude or 'mood' has a critical impact on ISP more than feelings, she did not explain how the mood affect search processes and the nature of the mood in a comprehensive way (Savolainen, 2015a).

Thus, the present study is significant because it is the first to fill the ISP related gap in the literature by,

- Focusing on undergraduate students' attitudes regarding ISP,
- Developing a valid and reliable attitude test for the first time regarding the LIS literature,
- Contributing to the ISP model concerning attitudes.

Depending on the authors' experiences and the vital gap in the literature, the purpose of the current research is to emphasize attitudes regarding ISP and aimed to develop a reliable and valid tool for measuring undergraduates' attitudes toward ISP.

Based on the aim of the study, the following research questions regarding the ASISP were answered:

1) How can attitudes toward ISP be measured?
2) Do the findings in the present study support the model of Kuhlthau, or should we propose a new model?
3) What are the relationships between the dimensions of the present study?

Methodology

The following sections included information of participants, the process, and the analyses carried out.

Sampling and Sample

Due to both limited time and financial means as well as the dispersed campus structure of the faculties of Ankara University (AU), the faculties other than social sciences and humanities were not included in the study. In selecting the study group, the purposive convenience sampling technique was used both to select among more easily available participants from the universe, and since the study participation was voluntarily (Teddlie & Yu, 2007). Before the scale was responded, the students were informed about the scale's objective and how it would be completed. The students were also informed that their participation in the study was voluntary, not mandatory.

A total of 17959 students constituted the population for the present study. Three different study groups were identified: to determine the validity of the construct, two groups were analyzed using EFA and CFA, and the reliability was tested using a final group, which was analyzed using Cronbach's Alpha. All three groups were made up of individuals from several fields, six faculties of AU (the Faculty of Languages History and Geography (FLHG); the Faculty of Educational Sciences; the Faculty of Law; the Faculty of Divinity; the Faculty of Communication; and the Faculty of Political Sciences) which are associated with the Social Sciences and Humanities. The characteristics of the three study groups are following.

Study Group 1

As proof of the construct validity, both an EFA and Item-total correlations were calculated. For the EFA, 883 students' data were collected from 13 departments of six faculties of Social Sciences and Humanities at AU. Proportional sampling technique was adopted for sampling. The sample included, FLHG, 37.1% (Anthropology, 43; Information and Records Management, 58; Philosophy, 44; History, 88; Turkish Language and Literature, 95); Faculty of Educational Sciences, 9.4% (Preschool, 44; Social Sciences Teaching, 39); Faculty of Law, 21.9% (193); Faculty of Divinity, 10.6% (94); Faculty of Communication, 7.4% (Journalism, 37; Radio, TV and Film, 28); Faculty of Political Sciences, 13.6% (Business Administration, 61; Political Science and Public Administration, 59). The 579 (66%) of the students were female, 300 (34%) were male, and 4 (0.5%) did not specify their gender. The participant's ages ranged between 18 and 72, with an average age of 21.34 (median=20). The great majority of participants (97.4%) were between 18-26 years of age (see Table 1).

Table 1
Distribution of Students Attending EFA Depending on Faculty and Department

Faculties	Departments	N	%
FLHG	Anthropology (43)	328	37.1
	Information and Records Management (58)		
	Philosophy (44)		
	History (88)		
	Turkish Language and Literature (95)		
Educational sciences	Preschool (44)	83	9.4
	Social Sciences Teaching (39)		
Law	Law (193)	193	21.9
Divinity	Divinity (94)	94	10.6
Communication	Journalism (37)	65	7.4
	Radio, TV and Film (28)		
Political sciences	Business Administration (61)	120	13.6
	Political Science and Public Administration (59)		
Total		883	100.0

Study Group 2

In order to demonstrate the validity of the results of the construct determined by the EFA and show the independence of its dimensions, a CFA correlation analysis was used. In addition, for the EFA and the inter-dimensional correlation calculations, data were collected from a group of 200 people who were also students in the same faculties of the AU, but this time in different departments (8 departments, excluding Law and Theology). The data for the CFA were taken from the data collected from 200 students [FLHG, 30.5% (Geography, 36; Sociology, 25); Faculty of Educational Sciences, 12% (Guidance and Psychological Counselling, 13; Elementary Education, 11); Faculty of Law, 21.5% (43); Faculty of Divinity, 16% (32); Faculty of Communication, 2.5% (Public Relations and Advertising, 5); Faculty of Political Sciences,

17.5% (Economics, 35)] . According to Kline (1994, 2000), it is enough to have a sample size of 200 persons in factor analysis, or for the ratio of subjects to items to be between 10/1 and 2/1. This suggests that the sample set for the CFA is sufficient. The 135 (68%) of the participants were female, and 65 (32%) were male. The participant's ages ranged between 18 and 26, with an average age of 22.84 (median=22) (see Table 2).

Table 2
Distribution of Students Attending CFA Depending on Faculty and Department

Faculties	Departments	N	%
FLHG	Geography (36) Sociology (25)	61	30.5
Educational sciences	Guidance and Psychological Counselling (13) Elementary Education (11)	24	12
Law	Law (43)	43	21.5
Divinity	Divinity (32)	32	16
Communication	Public Relations and Advertising (5)	5	2.5
Political science	Economics (35)	35	17.5
Total		200	100

Study Group 3

After the EFA and the CFA, Cronbach's Alpha (α) was calculated for a reliability study. To calculate of Cronbach's Alpha, data were collected from a group of 385 people who were also studying in the same faculties of AU and studying in different departments [9 departments- FLHG, 23.5%(American Culture and Literature, 37; Folklore, 18; Psychology, 33); Faculty of Educational Sciences, 25.4% (Elementary Education, 95); Faculty of Law, 9.6% (36); Faculty of Divinity, 10.4% (39); Faculty of Communication, 11.8% (Public Relations and Advertising, 44); Faculty of Political Sciences, 19.3% (Labour Economics and Industrial Relations, 29; International Relations, 43)] than study groups 1 and 2 (see Table 3). Quota Sampling was used for this reason, including gender (female and male) and age range (18-26) (Neuman, 2014; Cohen, Manion and Morrison; 2007). According to quota sampling for a population of 15000, the sample size of 375 is enough (Gay, Mills and Airasian, 2006:109). For a population of 20000, 374 can be accepted as big enough. Eleven participants from the total of 385 were excluded from the analysis because their ages were above 26 and thus outliers (ages between 27 and 70). For this reason, **374** students have been included in the analysis. Another criterion in establishing the sample size is the formula, which requires taking five to ten times the number of items (Tavşancıl, 2010). The number of items on the scale formed is 46. Thus, the number of participants needs to be between 230 and 460. Thus, the sample size of participants, 374, can be accepted as good. In this group of 374 individuals, 255 (68.2%) were female, and 119 (31.8%) were male, and their ages ranged between 18 and 26.

Table 3
Distribution of students attending the study depending on faculty and department

Faculties	Departments	N	%
FLHG	American Culture and Literature (37) Folklore (18) Psychology (33)	88	23.5
Educational sciences	Elementary Education (95)	95	25.4
Law	Law (36)	36	9.6
Divinity	Divinity (39)	39	10.4
Communication	Public Relations and Advertising (44)	44	11.8
Political science	Labour Economics and Industrial Relations (29) International Relations (43)	72	19.3
Total		374	100.0

Processes

Literature Review

In preparing the items (questions) which comprise the ASISP, the first step undertaken was to conduct a literature search, to determine what attitude scales that undergraduate students have relating to their ISP. After the literature review, no attitude scale relating to ISP was discovered. For this reason, while preparing the items, which form the attitude scale, Kuhlthau's ISP model (1983, 1991, and 1996) was first examined. In addition to this, other relevant literature on ISP (Barranoik, 2004; Cheng, 2004; Erfanmanesh et al., 2012; Hyldegård, 2006; 2009; Kracker, 2002; Kong, 2014; Kracker & Wang, 2002; Kurbanoğlu, Akkoyunlu, & Umay, 2006; Nahl, 1997; Peterson, 2008) have been extensively assessed.

To prepare the scaling items, the literature about attitudes and preparing attitude scales were extensively analysed as well (Ajzen, 2005; Allport, 1967; Anastasi & Urbina, 1997; Cronbach, 1990; Erfanmanesh et al., 2012; Franzoi, 2006; Likert, 1967, 2008; Papanastasiou, 2005; Timmers & Glas, 2010). Because of this literature review, the Likert attitude scale developed by Rensis Likert was determined to be the most appropriate measurement tool for this study, as Likert attitude scales have been used extensively by many researchers, especially in subjects which measure personality, attitude and various behaviours (Erfanmanesh et al., 2012; Papanastasiou, 2005, 2014; Van der Westhuizen, 2015). Moreover, the development of Likert scales is easier, and more economical and convenient than other scales.

Open-ended Questions and Interviews

One of the methods used in the preparation of the scale items, apart from the literature review, was to contact students directly. The interviews were carried out in the library of Chambers of Architecture, preparing a comfortable environment for the students. Three data collection studies were conducted for this purpose. Firstly, five open-ended questions were asked to 31 undergraduate students, and they were asked to write their opinions to reveal if the questions are comprehensible. The authors used the technique of 'saturation' (Padgett, 2008, pp. 171-172) for the number of participants. The authors agreed to stop interviews when the problems and ideas of comprehension by the participants start duplicating, and no more new ideas appeared. The undergraduate and graduate students coming from different departments (architecture, interior architecture, landscape architecture, restoration, art history) were volunteered to attend the study. Because the students came to the library of Chambers of Architecture for their research; thus, they did not reserve much time for responding to the questions.

Nevertheless, these responses gave the researchers many clues in improving the questions. The other two data collection (the second n=9, the third n=13) were performed at different times, averaging 1.5 hours of semi-structured interviews with different groups of students. The students participated in the study voluntarily. Student views on ISP which were obtained from the responses to these open-ended questions and semi-structured interviews provided very important data in the preparation of the items for the scale. The second data collection (n=9) help to improve the questions to reveal more in-depth information by increasing the number of questions.

Additionally, those volunteer students (9) are taken for a one-on-one interview. Each interview took approximately one and a half hour. The students were asked to make recommendations for comprehensibility and clarity of the items. This second pilot study increased the number of questions to nine.

Because the first two pilot studies included architecture students, only the researchers saw a need to include different fields of the university and included Social Sciences and Humanities students to expand the application area. For this reason, interviews done with 13

volunteer student belong to the FLHG of AU, Information and Documentation Department. The interviews were carried out in the same context, aforementioned. With this third pilot study, the number of questions was raised to ten.

Receiving Expert Opinion (Content/Appearance Validity)

In light of the literature and the data obtained from the interviews, 64 items were determined initially. These items were evaluated regarding content and comprehensibility by six experts/academics (three from the field of LIS; two from the field of Education Sciences and one from the field of Scale and Evaluation). Because of the suggestions from these people, the scale items were re-considered regarding their content and clarity, and the number of items was increased to 81. The experts recommended,

- Add some items. For example, ***Item 9.*** *I know what to do during topic selection.* ***Item 28.*** *I use my time well when I collect information about the topic focus I have decided on.*
- Separate those sentences, including two different ideas. For example, ***Item 36.*** *I have difficulty in synthesizing the information I have obtained about the topic focus I have decided on.* ***Item 39.*** *It is easy for me to write an assignment or a paper about the topic focus I have decided on*.

These 81 items were then given to the same six experts/academics for re-examining, and their opinions were requested. By the subsequent opinions and recommendations of the academics, the number of scale items was reduced to 73. This time one of those similar items were recommended to be deleted from the list. For example, the item: "I like to research those subjects is decided to search." was deleted which was similar to "***Item 14.*** *It is a great pleasure for me to investigate something that I'm interested in.*" was found to mean the same. This process concluded with the deletion of eight items.

Additionally, one expert suggested adding some biographic variables to the questionnaire. These are Wether, the student took a course about information retrieval, where they took this course, and if the course is beneficiary or not.

Preparation of Items and Evaluation of the Scale

In the preparation of the scale items, as directed by the data obtained from the literature, the interviews (the three pilot studies), and the expert opinions. Likert type scales are mostly used to measure individual characteristics, attitudes, and behaviors (O' Brien & Cairns, 2015). It was taken into consideration that: students should express their present attitudes, not their past ones; the items of the scale should not lead to different meanings, and should be short, brief and simple; items should not lead to more than one judgment, thought or feeling; the scope of the items should include both positive and negative aspects of the attitudes comprised by Likert scales (Likert, 1967); that each item should contain a single attitude element, and that items are suitable for the scale object which is to be measured. In the Likert attitude scale, five alternative ratings are generally used. In this study, the scale items are ranked from 1 to 5 as; "I disagree," "I do not agree," "I am undecided," "I agree" and "I agree." High scores of dimensions of task initiation, topic selection process, and skills of research methodology are to be interpreted as unfavorable while low ones as favorable.

The items were developed by the present researchers. First, the literature was investigated for ISP, and then the Kuhlthau's (1996) ISP model including six dimensions (Task initiation; Topic selection; Pre-focus exploration; Focus formulation; Information collection; Search closure) was thoroughly investigated. *The researchers focused on aspects of uncertainty, anxiety, confusion, confidence, optimism, satisfaction or disappointment, seeking information to support focus, gathering pertinent information, considering time limit, taking*

detailed notes with a bibliographic citation which are found in each dimension of Kuhlthau's model. All the aspects included were cognitive, affective, and physical aspects. For example, ***Item 3.*** *I find it* ***difficult*** *to understand the question of the* ***research topic*** *in an assignment or project* (Task initiation); ***Item 13. The topic selection*** *makes me* ***tired*** (Topic selection); ***Item 22.*** *When I decide which* ***direction to focus on****, my* ***anxiety*** *level reduces* (Focused formulation); ***Item 34.*** *It is* ***not easy for me*** *to decide which references are suitable for* ***information collection*** *about the topic focus I have decided on* (Information collection) etc.

Additionally, the researchers of the present study inspired by some items found in the literature. For example, two items guided the researchers from ISA of Erfanmanesh et al. (2012). These items are, *I feel anxious when resources found during information-seeking process is irrelevant* (p. 29) and *Selecting a general topic is a difficult part of information seeking process* (p. 31). Moreover, two items found in Kurbanoğlu et al.'s Information Literacy Self-Efficacy Scale (ILSES) (2006) *I feel confident and competent to identify a variety of potential sources of information,* and *I feel confident and competent to synthesize newly gathered information with previous information* were inspired the researchers. However, it is important to note here that no one item was copied from the literature.

The three pilot studies also guide the researchers in constructing the items. For example, S9 (second pilot study) stated that "*At first, I feel anxious when I hear about the project because I do not know what to do at that moment."* S9 is this statement was used to develop the ***Item 8. (Task Initiation).*** *I find it difficult to understand what is required from the topic of the assignment or project.* The other example is about Topic Selection Process. S3 (pilot study 3) stated that *"If I chose the research subject myself, I would feel more competent and be happy. I knew what to seek; I start immediately and start collecting sources. These statements of S3 directed the researchers to form two items".* One item *is (****Item 14).*** *It is a great pleasure for me to investigate something that I am interested in. The other one is* ***Item 11.*** *I feel relieved when I choose the subject of the study.*

Converting Items to Scale form and Physically Arranging the Scale Form

The items (n=73) based on the expert opinion according to their content validity, were then converted into the designated scale format. The items were formed as positive and negative statements [positive statements (n=36) and negatives (n=37)], trying to keep a balance in the numbers. A separate set of guidelines, outlining the aims of the scale and how the marking should be undertaken, have been prepared and appended to the form.

Performing Pretesting

To determine the clarity of the scale, to determine the approximate duration of the implementation and make the necessary amendments before the implementing the tests, it was applied to a group of 60 individuals (at an undergraduate level). Few rectifications were made during and after the pre-testing implementation by registering the opinions of the students regarding grammar.

Obtaining Required Permissions and Implementation of the Scale

To implement ASISP in the six above mentioned faculties of social sciences and humanities of AU, permission was obtained both from the Ethics Committee of the University and the deans of the six faculties. After obtaining the necessary permissions, the implementation of ASISP for factor analysis was carried out during the fall and spring semesters of 2013/2014 education and training year. The implementations were carried out by the author. In addition, during the implementation of the scale, to increase the students' confidence in the researcher and increase the response rate of

the scale, it was requested that the researcher is in the classroom alongside the lecturer from each course. The author's request was received positively by the lecturers, and the author was supported accordingly. The response time of the scale lasted approximately 15-20 minutes.

Data Analysis

First, descriptive statistics were used to analyze the data. Following this, the first step was to confirm the construct validity by making an EFA and total item correlation (n=883), and subsequently the calculation of the CFA and inter-dimensional correlation (n=200) with a separate group. The Cronbach α reliability coefficient (n=374) was then also calculated on another group to determine the reliability of the scale. The statistical programs SPSS 21.0 and LISREL 8.7 were used for statistical analysis of the study.

Findings

In this section, the findings of ASISP regarding the construct validity and reliability of the structure are given. Adopting similar studies (O'Brien & Toms, 2010; Papanastaiou, 2005) two-step route was followed when ASISP's construct validity was validated. In the first step, an EFA and item-total correlations and in the second step, a CFA and the correlation between dimensions were calculated. In calculating the reliability of ASISP, Cronbach's Alpha was used. Below, the findings obtained about EFA, CFA, and Cronbach's Alpha are presented.

Exploratory Factor Analysis and Item-Total Correlations Results

The information from the 883 students who answered ASISP fully was analyzed using SPSS 21.0. Seventy-three items were subjected to the basic components factor analysis with the option of varimax rotation. The following findings were obtained by analyzing.

The results of the Kaiser-Meyer-Olkin (KMO) and Bartlett's tests which demonstrate the suitability of data for factor analysis, revealed that sampling was enough. When the value of KMO was examined, the value of 0.92 indicated that the data could be considered as "perfect" for factor analysis. Along with this, Bartlett's Sphericity test result ($p<0.05$) reveals that there is a significant connection between variables in the scale. This result also demonstrates that the data are suitable for factor analysis (Hutcheson & Sofroniou, 1999 as cited in Field, Miles, & Field, 2012)

In the first step of the factor analysis, which was performed, it was seen that the eigenvalues of 15 factors were above 1 (Fu & Oh, 2019; Yu et al., 2015) (See Figure 1). However, when the factor and loading rates are examined, it is observed that for many factors, there were very few of the items with a load value above 0.40, or in some cases no-load value for some factors. To clarify the factors leading to these results, varimax rotation was performed. Because of this rotation, it is clearly understood that the scale comprises 5 or 6 factors. Initially, a 6-factor structure was attempted, but as the sixth factor did not cover enough items, and as the scale did not fit the theoretical structure, the scale, which emerged, had five dimensions.

During the exploratory factor analysis, items were excluded from the scale when they had factor load values below 0.40 (Erfanmanesh et al., 2012; Fu & Oh, 2019; O'Brien & Toms, 2010, 2013) and/or the items with a high load value of more than one factor, and when the difference between the load values of these factors was less than 0.1. As a result of this, the 6th, 16th, 18th, 47th, 52nd, 63rd, 65th, and 73rd items were excluded from the scale because their factor load factor was below 0.40; the 8th, 10th, 12th, 14th, 21st, 24th, 25th, 26th, 27th, 28th, 29th, 33rd, 35th, 36th, 37th, 39th, 40th, and 43rd items were excluded from the scale because they had more than one load values where the difference between the load values was less than 0.10. Figure 1 and Table 4 shows the five-factor structure emerging from this process.

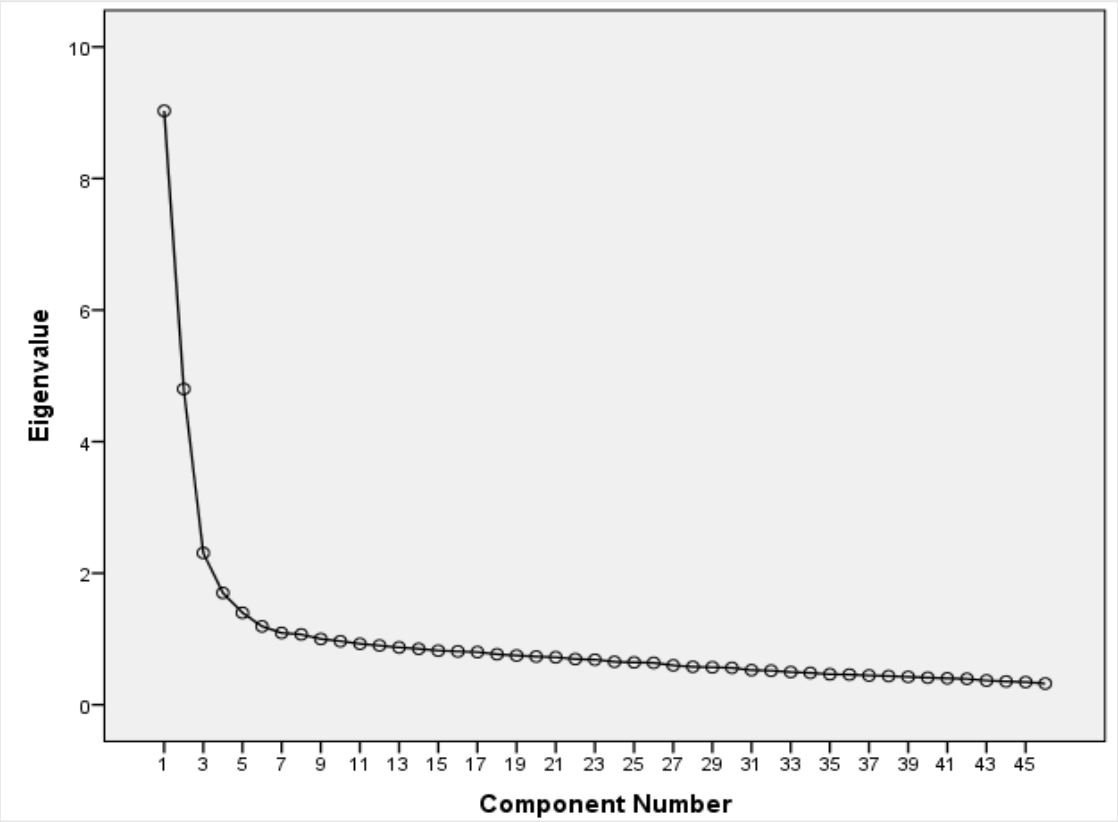

Figure 1. Exploratory factor analysis scree plot of the attitude scale related to ISP trail form

In the scree plot, a distinct five factorial structure has been observed. When the scree plot was analyzed, up to the 5th factor, the drops are relatively obvious, but the eigenvalue points after that become more frequent. This finding reveals that the 5-factor structure seen in the eigenvalue chart below also has been seen in the scree plot.

Table 4
Eigenvalues of ASISP and values of variations explained by factors

	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.02	19.62	19.62	4.69	10.20	10.20
2	4.80	10.43	30.06	4.27	9.29	19.50
3	2.30	5.01	35.07	4.19	9.11	28.61
4	1.70	3.69	38.77	3.38	8.01	36.62
5	1.39	3.03	41.81	2.38	5.18	41.81

5-factor structure shows a variance of 41.81% in the scale of 46 items. In other words, 41.81% of the 46 items are measured using this scale. As seen in Table 4, the exploratory factor analysis results, which relate to this scale, emerge as 5-dimensional (factors). Item total correlations, which are given in Appendix 1.

Confirmatory Factor Analysis Results

Following the EFA, the factor structure of the scale was tested with a CFA as further proof of the construct validity. The CFA model includes factors, which indicate that ASISP has a five-dimensional structure, and the standardized parameter estimates for the items are shown in Figure 2.

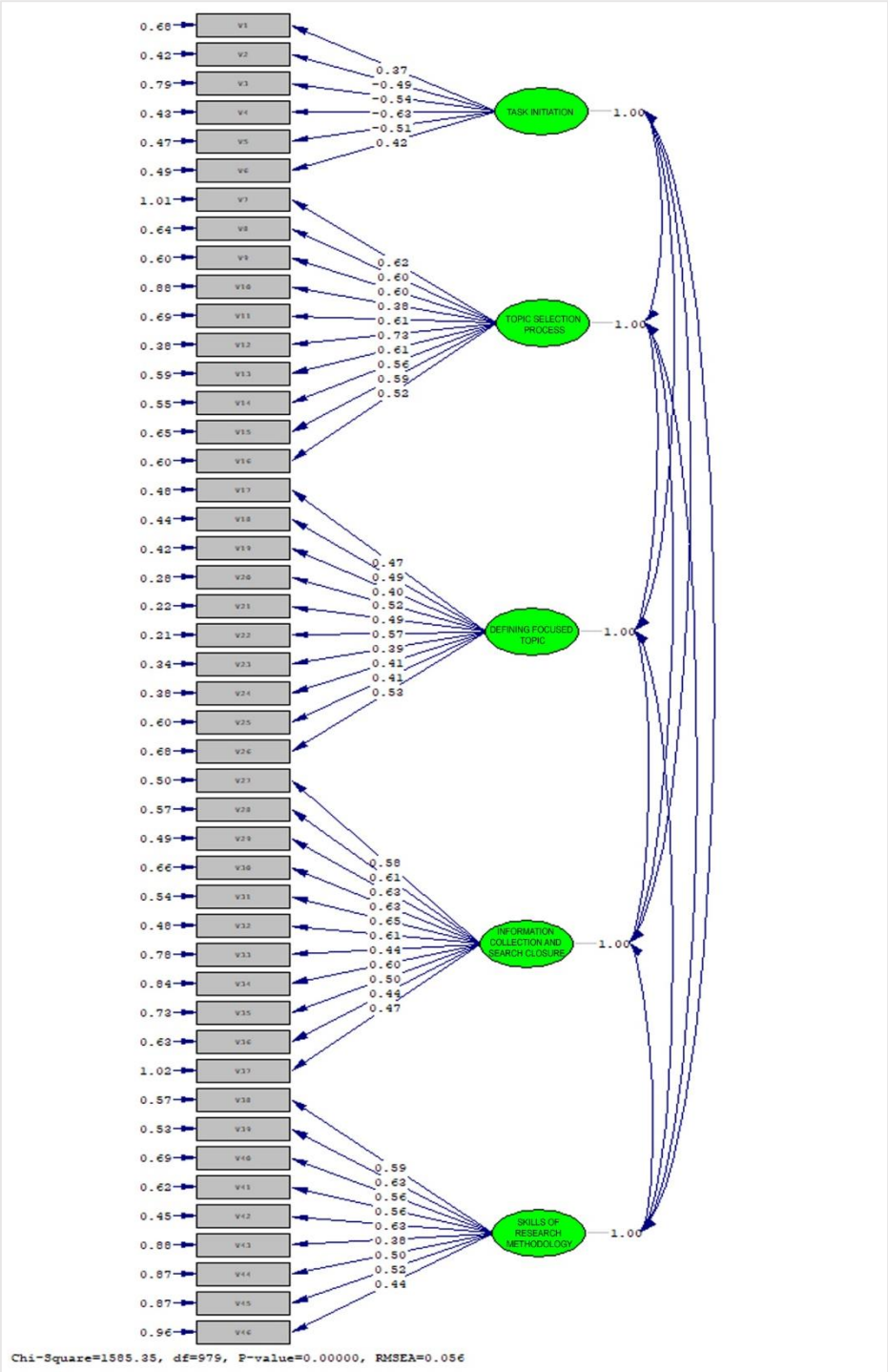

Figure 2. The confirmatory factor analysis model

The structure obtained from the EFA, containing five factors and 46 items, was tested using CFA. As a result of the CFA, goodness of fit indices was calculated as: $\chi 2/Sd=1.62$, RMSEA=0.056, NNFI=0.92, CFI=0.92 and IFI=0.92. These results can be understood as showing that the items created for the subscale comply with the total scores. As such, as the result of an outcome of CFA results, it has become clear that the scale has a 5-dimensional structure. In this context, the result of CFA was (See Appendix 1):

- Factor 1. Task Initiation (TI) - 6 items
- Factor 2. Topic Selection Process (TSP)- 10 items
- Factor 3. Defining Focused Topic (DFT) -10 items

- Factor 4. Information Collection and Search Closure (IC and SC)- 11 items
- Factor 5. Skills of Research Methodology (SRM) - 9 items

These items were selected from among the items under each factor that gave the best concordance. Thus, in the final form of the ASISP, 46 items were included.

- Factor 1: *Task Initiation (TI).* This factor is related to students' anxieties, inadequacy, difficulty, sufficiency, knowledge regarding starting the task. This factor included 10. 20% of the variance and constituted by six items. Item loadings ranged from 0.44 to 0.62.
- Factor 2: *Topic Selection Process (TSP).* This factor is related to tiring, time-consuming, boring, troublesome, uncertainty, and easiness regarding the topic selection process. This factor included 19.50% of the variance and constituted of ten items. Item loading ranged from 0.42 to 0.67.
- Factor 3: *Defining Focused Topic (DFT).* This factor is related relief, confidence in the ability to complete the task, optimism, increased interest, and knowledge regarding defining the focused topic. This factor included 28.61% of the variance and constituted of ten items. Item loading ranged from 0.52 to 0.70.
- Factor 4: *Information Collection and Search Closure (IC and SC).* This factor is related to optimism, knowledge, enjoyment, easiness, certainty regarding IC, and SC. This factor included 36.62% of the variance and constituted by 11 items. Item loading ranged from 0.45 to 0.61.
- Factor 5: *Skills of Research Methodology (SRM).* This factor is a related difficulty, frustrating, time-consuming, inadequacy, and knowledge regarding skills of research methodology. This factor included 41.81% of the variance and constituted of nine items. Item loading ranged from 0.45 to 0.65.

Correlation Results between Dimensions

Another finding for construct validity is the correlation values between subscales. Correlation values not being high between the subscales is a sign of the independence of dimensions. Correlations between subscales of ASISP are listed in Table 5 below.

Table 5
Correlation between subscales of ASISP

	TI	TSP	DFT	ICandSC
1. TI				
2. TSP	-0.56			
3. DFT	0.26	0.23		
4. ICandSC	0.54	-0.44	0.29	
5. SRM	-0.73	0.54	-0.21	-0.58

When Table 5 is examined, it is observed that the lowest correlation value is between the TI and SRM (r=-0.73) dimensions the highest correlation value is between the TI and the "IC and SC" as well as between the TSP and SRM dimensions (r=0.54). The correlation being generally low in a negative or positive direction is an important indication that the dimensions are sufficiently independent of each other. This can be regarded as a sign of construct validity.

Cronbach's Alpha Reliability Coefficients Results

In the reliability calculation of ASISP, "Cronbach's Alpha Reliability Coefficient" technique was used. The data for Cronbach's Alpha was obtained from 374 students who responded by the final scale.

Because the scale is multidimensional (5 dimensions), the constancy of the items in each subdimension of the scale with the sum of that subdimension was examined. For this reason, the Cronbach α reliability coefficient was calculated for each subscale. In this context, the Cronbach α coefficients for the sum and sub-dimensions of the ASISP and the item numbers of the dimensions are given in Table 6.

Table 6
Cronbach α coefficients related to the sum and sub-dimensions of ASISP and the item numbers of the dimensions

Dimensions	Cronbach Alfa	Item Numbers (K)
Task Initiation* (1)	0.71	6
Topic Selection Process* (2)	0.84	10
Defining Focused Topic (3)	0.83	10
Information Collection and Search Closure (4)	0.84	11
Skills of Research Methodology* (5)	0.79	9

*In these dimensions high values represent unfavorable while low scores are interpreted as favorable.

It is desirable for a scale to have a Cronbach α reliability coefficient as high as possible. The acceptable value of the Cronbach α reliability coefficient is 0.70 in the related literature (Field et al., 2012, p. 799). Kline (2000, p.15), states that the minimum reliability value for a good test/scale should be 0.70. In this context, when Table 6 is examined, it can be seen that the Cronbach α reliability coefficients obtained for the ASISP sum and sub-dimensions are between 0.71 and 0.84. When these values are evaluated in the light of the literature, it can be said that all of the scale and the items of each sub-dimensions are consistent with each other and the Cronbach α reliability coefficients for the sum and subscales of ASISP were satisfactory.

Test-Retest Correlations

Two test-retest calculations were carried out to ensure the reliability of both Turkish and English version of the ASISP. Fifty-five Education Faculty students attended the study. The students answered the items two times with a two weeks time interval. Test-retest of the items was calculated as 0.91 (Table 7). Correlation coefficients of test-retest indicated the reliability of the Turkish version of ASISP.

To developing the scale available for English speaking students, test-retest was applied. Fifty grade four students of Department of ELL answered items in Turkish, and two weeks later, the same students answered its English version. Test-retest of the items was calculated as 0.92 (Table 8). Correlation coefficients of test-retest indicated the reliability of the English version of ASISP.

Table 7
The correlation coefficient of test-retest of the Turkish version

Item No	r	Item No	r	Item No	r	Item No	r	Item No	r
1	0.63	11	0.82	21	0.71	31	0.58	41	0.83
2	0.62	12	0.63	22	0.60	32	0.55	42	0.68
3	0.56	13	0.63	23	0.66	33	0.67	43	0.64
4	0.63	14	0.72	24	0.59	34	0.51	44	0.54
5	0.56	15	0.83	25	0.65	35	0.63	45	0.62
6	0.81	16	0.62	26	0.52	36	0.72	46	0.69
7	0.59	17	0.69	27	0.75	37	0.56		
8	0.68	18	0.54	28	0.56	38	0.58		
9	0.54	19	0.55	29	0.52	39	0.56		
10	0.79	20	0.57	30	0.51	40	0.55	**Overall**	**0.91**

Table 8
The correlation coefficient of test-retest of the English version

Item No	r	Item No	r	Item No	r	Item No	r	Item No	r
1	0.92	11	0.71	21	0.58	31	0.76	41	0.73
2	0.86	12	0.59	22	0.78	32	0.62	42	0.89
3	0.82	13	0.60	23	0.72	33	0.58	43	0.76
4	0.86	14	0.74	24	0.76	34	0.60	44	0.59
5	0.89	15	0.53	25	0.65	35	0.67	45	0.64
6	0.80	16	0.61	26	0.56	36	0.74	46	0.84
7	0.69	17	0.66	27	0.73	37	0.54		
8	0.55	18	0.66	28	0.69	38	0.58		
9	0.63	19	0.70	29	0.64	39	0.67		
10	0.63	20	0.72	30	0.65	40	0.77	**Overall**	**0.92**

Conclusion and discussion

A valid and reliable measurement tool which can reveal the attitudes of undergraduate students towards ISP is produced by the present study. The scale has a total of 46 items and has a five-dimensional structure. The dimensions are respectively: The dimensions of the "Task initiation" consists of six items, the dimensions of the "Topic selection process" and "Defining focused topic" consist of ten items, the dimensions of the "Information collection and search closure" consists of eleven items, and the dimensions of the "Skills of research methodology" consists of nine items. High scores of dimensions of task initiation, topic selection process, and skills of research methodology are to be interpreted as unfavorable while low ones as favorable.

In preparing ASISP items, the ISP model's six stages were taken into consideration, and items were created separately concerning each stage. In Kuhlthau's model, while how the users' thoughts, feelings, and actions change during the ISP (academic, public, school) are investigated, these three elements are not treated as an attitude"s elements. However, when the scale items were being created in the present study, these three elements were treated as attitude's elements. However, while Kuhlthau (1983), as well as the previous studies (Haley & Clough, 2017; Kracker, 2002; Kracker & Wang, 2002; Krubu et al., 2017; Stewart,Seifert & Rolheiser, 2015; Wu et al., 2017) used different qualitative and quantitative techniques to investigate students' ISP over the tasks assigned to the students (research assignment-essay, thesis writing, group assignment, library and internet search etc.); the students were not assigned a task in the present research (such as essay, writing, library or internet search). In this research, whether or not undergraduate students use information centers or the Internet independently from the system was disregarded, and it was aimed to explore the experiences they have had, i.e. their current (positive-negative) attitudes in connection with information search.

Moreover, although items related to Kuhlthau's ISP *PE* stage were included, this not come up among ASISP dimensions. In EFA, *PE* items were observed to be combined with the DFT items. This may be interpreted as that the students do not carry out the *PE* process. Similarly, in "IC and SC," no separate processes came up unlike in ISP. This may also be interpreted as that the students carry out both processes at the same time. In addition, those related to method and technique in items prepared separately for ISP's *IC* and *SC* stages were observed separately. In other words, although items 27, 30 are related to *IC* and items 36, 45 are related to *SC*, they are grouped not under the correlated dimension but separately (See Appendix 1). Therefore, the dimension under which the items related to method and technique were grouped was named by the authors as SRM. We can interpret this outcome as that the students do not perform the ISP processes by following the stages in Kuhlthau's ISP model in order. This is a natural occurrence, which can usually be seen in a test/scale or model adaptation (Cronbach, 1990; Deniz, 2007; Hambleton, 2005). Cronbach (1990) notes that different cultures respond differently to the same thing and that a test (e.g. an aptitude test) developed for western

cultures may not conform to the traditions of some other cultures (especially in developing countries). Therefore, Kuhlthau's ISP model had also been developed in accordance with the cultural and educational system of the USA.

For this reason, the names of the dimensions of ASISP do not correspond with the names of the stages in Kuhlthau's ISP model; this can be linked to the differences between the cultures and the educational systems (Çakmak, 2016). This result is consistent with the findings of Chaura (2015); Krubu et al. (2017), and Wu et al. (2017). Chaura (2015) found that inconsistent with Kuhlthau, university students do not feel anxious, uncertain, confused or doubtful regarding ISP's initiation stage and they do not think to quit whenever they are not successful in finding the required information in the conclusion step of the process.

Similarly, Krubu et al. (2017) studying with university students, do not find any clear feelings such as uncertainty, optimism, and confusion/doubt inconsistent with what is frequently found at the phases of initiation, selection, and exploration of ISP model. Thus, the findings of Krubu et al. did not match with Kuhlthau's model. It is remarkable that these three studies were carried out with Eastern (Asian and African) culture and developing country students. In this context, this study can assist in the development of a more comprehensive, effective, and efficient training program for teachers, training programmers, and advisory librarians. Also, it can assist in aid of the planning of the training programs for ISP, by determining which phases of this process students have skipped, as well as by eliminating any unnecessary steps.

Implications

This scale development study has introduced a new approach to the researches on ISP by examining the attitude dimension. Revealing the positive and negative attitudes of undergraduate students towards ISP using this scale can provide significant benefits to both librarians and educators. By this way, both groups (librarians and teachers) can determine the strengths and weaknesses of the students by revealing what problems students have with the research process, which phases of the process they find challenging, and which stages they are satisfied with. This will enable them to take precautions to remedy problems, by knowing in advance, what problems students have with their ISP. Thus, in the content and scope, which aims at improving the knowledge and skills of students regarding the ISP, it may be possible to improve further the planning of student-centered education and training programs, supported with theoretical as well as practical knowledge. For example, taking into consideration the attitudes of students, librarians can plan and develop their library literacy and user training programs, and teachers can plan and develop the content of courses such as research processes and research methods.

Moreover, the scale can be tested and developed by applying it to undergraduate students who are studying in other sciences, as well as to different groups of graduate students, and can be used in comparative studies. Furthermore, the scale may offer a significant contribution to other ISP in LIS field, especially the studies investigating the affective factors regarding ISP, and provide a different perspective to such studies in respect to attitudes towards affective factors.

Limitation

All the reliability and validity studies of the scale were applied to students who were studying at the undergraduate level in social sciences and humanities. However, the scale does not consist of discipline-specific queries, instead of general statements, which will reflect the knowledge and skills relating to the information search process of students in all fields such as science, engineering, and medicine.

References

Ajzen, I. (2005). *Attitudes, personality and behavior* (2nd ed.). England, New York: Open University Press Maidenhead.

Allport, G. W. (1967). Attitudes. In M. Fishbein (Ed.), *Readings in attitude theory and measurement* (pp.1-13). New York, London, Sydney: John Wiley & Sons.

Al-Samarraie, H., Eldenfria, A., & Dawoud, H. (2017). The impact of personality traits on users' information-seeking behavior. *Information Processing and Management*, *53*(1), 237-247. doi: https://doi.org/10.1016/j.ipm.2016.08.004

Anastasi, A., & Urbina, S. (1997). *Psychological testing* (7th ed.). N.J.: Prentice Hall.

Anderson, T. D., Bates, M. J., Berryman, J., Erdelez, S., & Heinström, J. (2006). Designing of uncertainty. *Proceedings of the American Society for Information Science and Technology*, *43* (1), 1-9. doi: https://doi.org/10.1002/meet.14504301170

Aronson, E., Wilson, T. D., & Akert, R. M. (2013). *Social psychology* (8th. ed.). Boston: Pearson

Barranoik, L. K. (2004). *Meaningful research projects: Perspectives from high school students and their teacher* (Unpublished doctoral dissertation), University of Alberta, Canada.

Beheshti, J., Cole, C., Abuhimed, D., & Lamoureux, I. (2015). Tracking middle school students' information behavior via Kuhlthau's ISP Model: Temporality. *Journal of the Association for Information Science and Technology*, *66*(5), 943-960. doi: https://doi.org/10.1002/asi.23230

Bentley, D. C., Robinson, A. C., & Ruscitti, R. J. (2015). Using guided inquiry and the information search process to develop research confidence among first year anatomy students. *Anatomical Science Education*, *8*(6), 564-573. doi: https://doi.org/10.1002/ase.1527

Bohner, G., & Dickel, N. (2011). Attitudes and attitude change. *Annual Review of Psychology*, *62*, 391-417. doi: https://doi.org/10.1146/annurev.psych.121208.131609

Bohner, G., & Wänke, M. (2002). *Attitudes and attitude change*. Hove, U. K.: Psychology Press.

Burdick, T. A. (1995). *Gender in the information search process: An exploratory study of student experience* (Unpublished doctoral dissertation), The Florida State University, Tallahassee, Florida.

Büyüköztürk, Ş. (1997). Araştırmaya yönelik kaygı ölçeğinin geliştirilmesi. *Kuram ve Uygulamada Eğitim Yönetimi*, *3*(4), 453-364. http://kuey.net/index.php/kuey/article/view/683 [Accessed 10 May 2013].

Byron, S. M., & Young, J. I. (2000). Information seeking in a virtual learning environment. *Research Strategies*, *17*(4), 257–267. doi: https://doi.org/10.1016/S0734-3310(01)00055-6

Cacioppo, J. T., Petty, R. E., & Geen, T. R. (1989). Attitude structure and function: From the tripartite to the homeostasis model attitudes. In A. R. Pratkanis, A. J. Breckler, & A. G. Greenwald (Eds.), *Attitude structure and function* (pp. 275-309). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Case, D. O., & Given, L. M. (2016). *Looking for information: A survey of research on information seeking, needs, and behavior* (4th Ed.). UK: Emerald Group Publishing.

Chaura, M. G. (2015). Information behaviour of final year students of Mzuzu University in Malawi. *Library Philosophy and Practice (e-journal)*, 1-26. http://digitalcommons.unl.edu/libphilprac/1249 [Accessed 25 July 2017].

Cheng, Y. (2004). *Thoughts, feelings, and actions: Quantitative comparisons of interactions and relationships among three factors in college students' information seeking* (Unpublished doctoral dissertation). Indiana University, Bloomington.

Chowdhury, S., Gibb, F., & Landoni, M. (2011). Unceartainty in information seeking and retrieval: A study in an academic environment. *Information Processing and Management*, 47(2), 157-175. doi: https://doi.org/10.1016/j.ipm.2010.09.006

Cole, C., Beheshti, J., & Abuhimed, D. (2017). A relevance model for middle school students seeking information for an inquiry-based class history project. *Information Processing and Management*, *53*(2), 530-546. doi: https://doi.org/10.1016/j.ipm.2016.10.002

Cole, C., Beheshti, J., Abuhimed, D., & Lamoureux, I. (2015). The end game in Kuhlthau's ISP Model: Knowledge construction for grade 8 students researching an inquiry-based history project.

Journal of the Association for Information Science and Technology, 66(11), 2249-2266. doi: https://doi.org/10.1002/asi.23300

Cronbach, L. J. (1990). *Essentials of psychological testing* (5th ed.). New York: Harper & Row.

Çakmak, N. (2016). *Lisans öğrencilerinin bilgi arama süreçleri ile ilgili kavramları, tutumları ve düşünceleri [Undergraduate students' concepts, attitudes and thoughts regarding information search process]* (Unpublished doctoral dissertation), Ankara University, Ankara.

Çakmak, N., & Baysen, E. (2013). Kavram haritalarının bilgi arama süreçlerinde kullanılması [The use of concept maps in information search process], *Bilgi Dünyası, 14*(2), 358-372. http://bd.org.tr/index.php/bd/article/view/404 / [Accessed 1 July 2013].

Deniz, K. Z. (2007). Psikolojik ölçme aracı uyarlama [Adaptation of psychological scales]. *Ankara University, Journal of Faculty of Educational Sciences*, *40*(1), 1-16. http://dergiler.ankara.edu.tr/dergiler/40/152/1100.pdf [Accessed 15 June 2015].

Erfanmanesh, M. (2016). Information seeking anxiety: Effects of gender, level of study and age. Library Philosophy and Practice (e-journal), 1-20. http://digitalcommons.unl.edu/libphilprac/1317/ [Accessed 25 July 2017].

Erfanmanesh, M., Abrizah, A., & Karim, N. H. A. (2012). Development and validation of the information seeking anxiety scale. *Malaysian Journal of Library & Information Science, 17*(1), 21-39. http://ejum.fsktm.um.edu.my/ArticleInformation.aspx?ArticleID=1178 [Accessed 29 August 2017]

Field, A., Miles, J., & Field, Z. (2012). *Discovering statistics using. R*. Los Angeles: Sage.

FitzGerald, L. (2016). Does guided inquiry enhance learning and metacognition? *Synergy, 14*(1), 194-215. https://www.slav.vic.edu.au/synergy/volume-14-number-1-2016/research.html [Accessed 14 October 2017].

Franzoi, S. L. (2006). *Social psychology* (4th ed.). New York: McGraw-Hill.

Fu, H., & Oh, S. (2019). Quality assessment of answers with user-identified criteria and data-driven features in social Q&A. *Information Processing and Management, 56,* 14-28. doi: https://doi.org/10.1016/j.ipm.2018.08.007

Geffert, B., & Christensen, B. (1998). Things they carry: attitudes toward, opinions about, and knowledge of libraries and research among incoming college students. *Reference & User Services Quarterly, 37*(3), 279-289. https://www.jstor.org/stable/20863330 [Accessed 28 October 2017].

George, M. W. (2008). *The elements of library research: What every student needs to know.* New Jersey. Princeton University.

Haley, A. N., & Clough, P. (2017). Affective experiences of international and home students during the information search process. *New Review of Academic Librarianship,* 1-25. doi: https://doi.org/10.1080/13614533.2017.1308387

Hambleton, R. K. (2005). Issues, designs, and technical guidelines for adapting tests into multiple languages and cultures. In R. K. Hambleton, P. F. Merenda, & C. D. Spielberger (Eds.), *Adapting edcucational and psychological tests for cross-cultural sssessment* (pp. 3-39). New York: Pergamon.

Hendahewa, C., & Shah, C. (2017). Evaluating user search trails in exploratory search tasks. *Information Processing and Management*, *53*(4), 905-922. doi: https://doi.org/10.1016/j.ipm.2017.04.001

Hook, L., & Gaver, M. V. (1962). *The research paper: Gathering library material organizing and preparing the manuscript* (3th ed.). Englewood Cliffs, New Jersey: Prentice-Hall.

How, L. C., & Krosnick, J. A. (2017). Attitude strength. *Annual Review of Psycholog, 68,* 327-351.doi: https://doi.org/10.1146/annurev-psych-122414-033600

Hyldegård, J. (2006). Collaborative information behavior exploring Kuhlthau's information search process model in a group-based educational setting. *Information Processing and Management, 42*(1), 276-298. doi: https://doi.org/10.1016/j.ipm.2004.06.013

Hyldegård, J. (2009). Beyond the research process: Exploring group members' information behavior in context. *Information Processing and Management, 45*(1), 142-158. doi: https://doi.org/10.1016/j.ipm.2008.05.007

Ingwersen, P., & Järvelin, K. (2005). *The turn: Integration of information seeking and retrieval in context*. Netherlands: Springer.

Kelvin, P. (1970). *The bases of social behaviour: An approach in terms of order and value*. United Kingdom: Holt, Rinehart and Winston.

Klentzin, J. C. (2010). The borderland of value: Examining student attitudes towards secondary research. *Reference Services Review*, *38*(4), 557-570. doi: https://doi.org/10.1108/00907321011090728

Kline, P. (1994). *An easy guide to factor analysis*. London, New York: Routledge.

Kline, P. (2000). *The handbook of psychological testing* (2nd ed.). London, New York: Routledge,

Kong, S. C. (2014). Developing information literacy and critical thinking skills through domain knowledge learning in digital classrooms: An experience of practicing flipped classroom strategy. *Computers & Education, 78,* 160-173. doi: https://doi.org/10.1016/j.compedu.2014.05.009

Korkmaz, Ö., Şahin, A., & Yeşil, R. (2011). Bilimsel araştırmaya yönelik tutum ölçeği geçerlilik ve güvenirlik çalışması [Study of validity and reliability of scale of attitude towards scientific research]. *Elementary Education Online, 10*(3), 961-973. http://ilkogretim-online.org.tr/index.php/io/article/view/1569/1405 [Accessed 12 August 2017].

Kracker, J. (2002). Research anxiety and students' perceptions of reseacrh: an experiment. Part I. Effect of teaching Kuhlthau's ISP model. *Journal of American Society for Information Science and Technology, 53*(4), 282-294. doi: https://doi.org/10.1002/asi.10040

Kracker, J., & Wang, P. (2002). Research anxiety and students' perceptions of reseacrh: an experiment. Part II. Content analysis of their writings on two experience. *Journal of American Society for Information Science and Technology, 53*(4), 295-307. doi: https://doi.org/10.1002/asi.10041

Krubu, D. E., Zinn, S., & Hart, G. (2017). Making sense of the information seeking process of undergraduates in a specialised university: Revelations from dialogue journaling on whatsapp messenger. *Interdisciplinary Journal of E-Learning & Learning Objects*, *13*, 19-36. http://eds.a.ebscohost.com/eds/detail/detail?vid=3&sid=ea7c1748-0863-4014-9e99-fbb76a894140%40sessionmgr4008&bdata=JnNpdGU9ZWRzLWxpdmU%3d#AN=124280853&db=a9h [Accessed 22 August 2017].

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 the State University of New Jersey, New Jersey.

Kuhlthau, C. C. (1988). Longitudinal case studies of the information search process of users in libraries. *Library & Information Science Research, 10*(3), 257-304.

Kuhlthau, C. C. (1991). Inside the serach process: information seeking from the user's perspective. *Journal of the American Society for Information Science, 42*(5), 361-371.

Kuhlthau, C. C. (1996). *Seeking meaning: A process approach to libray and information services* (4th ed.). Norwood, NJ: Ablex.

Kuhlthau, C. C. (2007). Reflections on the development of the model of the Information Searh Process (ISP): Experts from the Lazerow lecture, University of Kentucky, April 2, 2007. *Bulletin of the American Society for Information Science & Technology, 33*(5), 32-36. doi: https://doi.org/10.1002/bult.2007.1720330511

Kuhlthau, C. C., George, M. W., Turock, B. J., & Belvin, R. J. (1990). Validating a model of the research process: A comprarison 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 stil useful? *Information Research: An International Electronic Journal 13*(4). http://www.informationr.net/ir/13-4/paper355.html [Accessed 08 August 2012]

Kurbanoglu, S. S., Akkoyunlu, B., & Umay, A. (2006). Developing the information literacy selfefficacy scale. *Journal of Documentation, 62*(6), 730-743. doi: http://dx.doi.org/10.1108/00220410610714949

Kyaw Soe, H. H., Than, N. N., Lwin, H., Nu Htay, M. N., Phyu, K, L., & Abas, A. L. (2018). Knowledge, attitudes, and barriers toward research: The perspectives of undergraduate medical

and dental students. *Journal of Education and Health Promotion* [serial online], 7-23. doi: 10.4103/jehp.jehp_61_17

Likert, R. (1967). The method of constructing an attitude scale. In M. Fishbein (Ed.) *Readings in attitude theory and measurement* (pp. 90-95). New York, London, Sydney: John Wiley & Sons.

Likert, R. (2008). The technique for the measurement of attitudes. In C. Roberts, & R. Jowell (Eds.), *Vol.1. Attitude measurement* (pp.203-215). Los Angeles: Sage.

Lopatovska, I., & Arapakis, I. (2011). Theories, methods, and current research on emotions in library and information science, information retrieval and human–computer interaction. *Information Processing and Management, 47*(4), 575-592. doi. https://doi.org/10.1016/j.ipm.2010.09.001

Manarin, K., McGrath, A., & Carey, M. (2016). Original undergraduate research in classroom contexts: Student perceptions of a scaffolded approach. *Collected Essays on Learning and Teaching, 9*, 35-42. https://celt.uwindsor.ca/ojs/leddy/index.php/CELT/article/view/4402/3825 [Accessed 25 September 2017].

Marchionini, G. (1989). Information seeking strategies of novices using a full-text electronic encylopedia. *Journal of the American Society for Information Science*, *40*(1), 54-66.

McGuire, W. J. (1969). The nature of attitudes and attitude change. In G. Lindzey, & E. Aronson (Eds.), *Vol 3. The handbook of social psychology* (2nd ed.) (pp. 136-314). Reading, Mass.: Addison-Wesley.

Nahl, D. (1997). Information counseling inventory of affective and cognitive reactions while learning the internet. *Internet Reference Services Quarterly*, *2*(2-3), 11-33. doi: https://doi.org/10.1300/J136v02n02_04

Naveed, M. A. (2017). Information seeking anxiety: Background, research, and implications. *International Information & Library Review*, 1-8. doi: https://doi.org/10.1080/10572317.2017.1319713

Naveed, M. A., & Ameen, K. (2016). Information seeking anxiety among postgraduate students of university. *Journal of Behavioural Sciences*, *26*(1), 142-154. http://web.b.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=5&sid=295f19a7-9221-4501-9d92-19a270bd8719%40pdc-v-sessmgr02 [Accessed 25 July 2017].

O'Brien, H. L. & Cairns, P. (2015). An empirical evaluation of the User Engagement Scale (UES) in online news environments. *Information Processing and Management*, *51*(4), 413-427. doi: https://doi.org/10.1016/j.ipm.2015.03.003

O'Brien, H. L. & Toms, E. G. (2010). The Development and evaluation of a survey to measure user engagement. *Journal of the American Society for Information Science and Technology, 61*(1), 50-69. doi: 10.1002/asi.21229

O'Brien, H. L. & Toms, E. G. (2013). Examining the generalizability of the User Engagement Scale (UES) in exploratory search. *Information Processing and Management*, *49*(5), 1092-1107. doi: https://doi.org/10.1016/j.ipm.2012.08.005

Opara, I. M. & Ekeh, P. U. (2017). Selected variables influencing undergraduate students'attitude toward educational research writing in University of Port Hacourt, Rivers State, Nigeria. *International Journal of Education, Learning and Development*, *5*(10), 9-18. http://www.eajournals.org/ [Accessed 21 November 2018].

Orlu, A. D., Mafo, I. H., & Tochukwu, N. T. (2017). Perceived emotions in the information seeking behaviour of Manchester Metropolitan University students. *Library Philosophy and Practice (e-journal)*. http://digitalcommons.unl.edu/libphilprac/1534/ [Accessed 17 August 2017].

Padgett, D. K. (2008). *Qualitative methods in social work research*. (2nd. ed.). Los Angeles, London, New Delhi, Singapore: Sage.

Papanastasiou, E. C. (2005). Factor structure of the 'attitudes towards research' scale. *Statistics Education Research Journal, 4*(1), 16-26. http://iase-web.org/documents/SERJ/SERJ4(1)_Papanastasiou.pdf [Accessed 28 July 2017].

Papanastasiou, E. C. (2014). Revised-attitudes toward research scale (R-ATR); a first look at its psychometric properties. *Journal of Research in Education, 24*(2), 146-159. http://files.eric.ed.gov/fulltext/EJ1098280.pdf [Accessed 22 September 2015].

Peterson, J. W. (2008). *Networked generation youth's information seeking process: An examination of cognitive, affective, and physical information seeking behaviors and problem solving techniques* (Unpublished doctoral dissertation), University of North Texas, Texas.

Rieh, S. Y., Collins-Thompson, K., Hensen, P., & Lee, H-Y. (2016). Towards searching as a learning process: A review of current perspectives and future directions. *Journal of Information Science, 42*(1), 19-34. doi: 10.1177/0165551515615841

Rouse, W. B., & Rouse, S. H. (1984). Human information seeking and design of information systems. *Information Processing and Management*, *20*(1-2), 129-138. doi: https://doi.org/10.1016/0306-4573(84)90044-X

Savolainen, R. (2009). Information use and information processing: Comparison of conceptualizations. *Journal of Documentation*, *65*(2), 187-207. doi: https://doi.org/10.1108/00220410910937570

Savolainen, R. (2015a). The interplay of affective and cognitive factors in information seeking and use: Comparing Kuhlthau's and Nahl's models. *Journal of Documentation*, *71*(1), 175-197. doi: https://doi.org/10.1108/JD-10-2013-0134

Savolainen, R. (2015b). Approaching the affective factors of information seeking: The viewpoint of the information search process model. *Information Research: An International Electronic Journal, 20*(1). http://files.eric.ed.gov/fulltext/EJ1060493.pdf [Accessed 10 July 2017].

Schwarz, N. (2008). Attitude measurement. In W. D. Crano, & R. Prislin (Eds.). *Attitudes and attitude change* (pp. 41-60). NY: Taylor & Francis.

Stewart, G., Seifert, T. A., & Rolheiser, C. (2015). Anxiety and self-efficacy's relationship with undergraduate students' perceptions of the use of metacognitive writing strategies. *The Canadian Journal for the Scholarship of Teaching and Learning*, *6*(1). doi: 10.5206/cjsotl-rcacea.2015.1.4

Taylor, A. (2012). User relevance criteria choices and the information search process. *Information Processing and Management*, *48*(1), 136-153. doi: https://doi.org/10.1016/j.ipm.2011.04.005

Teddlie, C., & Yu, F. (2007). Mixed methods sampling: A typology with examples. *Journal of Mixed Methods Research*, *1*(1), 77-100. doi: https://doi.org/10.1177/2345678906292430

Timmers, A. F., & Glas, C. A. W. (2010). Developing scales for information-seeking behaviour. *Journal of Documentation*, *66*(1), 46-69. doi: 10.1108/00220411011016362

Vakkari, P. (1999). Task complexity, problem structure and information actions: Integration studies on information seeking and retrieval. *Information Processing and Management*, *35*(6), 819-837. doi: https://doi.org/10.1016/S0306-4573(99)00028-X

Van der Westhuizen, S. (2015). Reliability and validity of the attitude towards research scale for a sample of industrial psychology students. *South African Journal of Psychology, 45(*3), 386-396. doi: https://doi.org/10.1177/0081246315576266

Wilson, T. D. (1999). Models in information behavior research. *Journal of Documentation*, *55*(3), 249-270. doi: https://doi.org/10.1108/EUM0000000007145

Wilson, T. D., Ford, N., Ellis, D., Foster, A., & Spink, A. (2002). Information seeking and mediated seraching: Part 2. Uncertainty and its correlates. *Journal of the American Society for Information Science and Technology*, *53*(9), 704-715.

Wu, D., Dang, W., He, D., & Bi, R. (2017). Undergraduate information behaviors in thesis writing: A study using the Information Search Process model. *Journal of Librarianship and Information Science*, *49*(3), 256-268. doi: https://doi.org/10.1177/0961000616654960

Yoon, K., & Nilan, M. S. (1999). Toward a reconceptualization of information seeking research: Focus on the exchange of meaning. *Information Processing and Management*, *35*(6), 871-890. doi: https://doi.org/10.1016/S0306-4573(99)00031-X

Yu, Y., Shiu, C-S., Yang, J. P., Wang, M., Simoni, J. M., Chen, W. & Zhao, H. (2015). Factor analyses of a social support scale using two methods. *Quality of Life Research, 24*, 787–794. doi: 10.1007/s11136-014-0815-4

Zhou, M. (2013). I am really good at it" or "i am just feeling lucky": the effects of emotions on information problem-solving. *Educational Technology Research and Development, 61*(3), 505-520. doi: http://dx.doi.org/10.1007/s11423-013-9300-y

Appendix 1: Consequential factor analysis results

Item Number in Final Scale	Item-Total Correlations	Task* Initiation	Topic*Selection Process	Defining Focused Topic	Information Collection and Search Closure	Skills of* Research Methodology
Item 4. I felt myself inadequate during the process of thinking about topic selection for the assignment or project. (Item 5) **	0.42	**0.618**	0.254			
Item 9. I know what to do during topic selection. (Item 15) ***	0.37	**0.549**			0.315	
Item 7. I don't know how to select the appropriate topic for the assignment or project. (Item 11)	0.55	**0.529**	0.290			0.251
Item 8. I find it difficult to understand what is required from the topic of the assignment or project. (Item 13)	0.48	**0.512**				0.344
Item 3. I find it difficult to understand the question of the research topic in an assignment or project. (Item 3)	0.50	**0.477**				0.295
Item 2. It is easy for me to express the requested subject for the assignment. (Item 2) ***	0.34	**0.438**			0.286	
Item 13. Topic selection makes me tired. (Item 22)	0.69		**0.678**			
Item 18. Because the process of finding a focus within the context of a general subject takes a long time, it is tiring for me. (Item 34)	0.59		**0.666**			0.302
Item 21. Because the decision process of which aspect to focus on from the topic takes a long time, it is tiring for me (Item 42)	0.55		**0.605**			
Item 12. I get bored by the topic selection process. (Item 20)	0.53		**0.644**			
Item 16. The process of obtaining a focus within the context of the topic bores me. (Item 31)	0.58		**0.616**			0.264
Item 1. The process between the day I get the assignment to the day I choose the topic that I will study is troublesome for me. (Item 1)	0.47		**0.516**			
Item 5. I get tired when it takes long time to think about topic selection process. (Item 7)	0.53		**0.512**			
Item 6. The uncertainty that I experience during the preparation of the topic selection process makes me tired. (Item 9)	0.53	0.311	**0.486**			
Item 23. Not being able to determine exactly which aspects of the topic that I will focus on worries me (Item 45)	0.47		**0.443**	0.321		
Item 10. For the searching process to be easier, I choose topics that I can easily find data for (Item 17)	0.36		**0.420**			
Item 17. I like being able to know which sources I would benefit from during the process of finding a focus on the topic. (Item 32)	0.58			**0.705**		
Item 19. It's comforting for me to know what to do when determining which aspect of the topic to focus on. (Item 38)	0.63			**0.698**		
Item 22. When I decide which direction to focus on, my anxiety level reduces. (Item 44)	0.47			**0.676**		
Item 15. When I see a likely subdivision of the subject during the process of finding a focus on the general topic, I get to relax. (Item 30)	0.49			**0.635**		
Item 20. Once I decide which aspect of the topic I will focus on, my confidence about finishing the research increases. (Item 41)	0.69			**0.623**		
Item 46. It makes me relieved to know that I have enough resources to write a report or assignment about the topic focus I have decided on. (Item 72)	0.46			**0.588**		
Item 26. I like to use more than one resource when I'm collecting information for the topic focus I have decided on. (Item 49)	0.41			**0.568**		

Item 14. It is a great pleasure for me to investigate something that I'm interested in. (Item 23)	0.56			**0.562**		
Item 11. I feel relieved when I choose the subject of the study. (Item 19)	0.50			**0.546**		
Item 24. I know which direction the research will go when I decide which direction to focus on. (Item 46)	0.49			**0.522**	0.252	
Item 35. I know when to finish the information search about the topic focus I have decided on. (Item 59)	0.59				**0.618**	
Item 39. It's easy for me to write an assignment or a paper about the topic focus I have decided on. (Item 64)	0.52				**0.601**	
Item 31. I enjoy identifying the keywords to reach the information about the topic focus I have decided on. (Item 55)	0.56			0.267	**0.595**	
Item 29. It's very easy for me to access the information sources that I want about the topic focus I have decided on. (Item 53)	0.58				**0.595**	
Item 42. I know how to write a quality assignment or paper about the topic focus I have decided on. (Item 68)	0.44	-0.302			**0.577**	
Item 28. I use my time well when I collect information about the topic focus I have decided on. (Item 51)	0.56				**0.570**	
Item 37. I enjoy the synthesis process of the information that I obtain about the topic focus I have decided on. (Item 61)	0.41		-0.262	0.272	**0.564**	
Item 44. For me writing the assignment or the paper about the topic focus I have decided on is the most enjoyable part of the research. (Item 70)	0.42				**0.558**	
Item 33. I enjoy the information collection process about the topic focus I have decided on. (Item 57)	0.60		-0.26	0.328	**0.555**	
Item 25. I'll know where to find the information about the topic focus I have decided on. (Item 48)	0.54				**0.514**	
Item 40. It is not difficult for me to produce the citation that I used in the assignment or paper about the topic focus I have decided on. (Item 66)	0.45				**0.455**	-0.305
Item 30. I have difficulty in creating methods and techniques that I will use to gather information about topic focus I have decided on. (Item 54)	0.55		0.261			**0.658**
Item 36. I have difficulty in synthesizing the information I have obtained about the topic focus I have decided on. (Item 60)	0.57					**0.632**
Item 27. I find it difficult to identify the key words to find the information about the topic focus I have decided on. (Item 50)	0.56					**0.630**
Item 45. I do unnecessary repetitions when writing an assignment or paper about the topic focus I have decided on. (Item 71)	0.41					**0.543**
Item 34. It is not easy for me to decide which references are suitable for information collection about the topic focus I have decided on. (Item 58)	0.46					**0.538**
Item 41. I am not competent in the literary language of the assignment or the paper about the topic focus I have decided on. (Item 67)	0.48					**0.530**
Item 32. Sometimes I have access to the wrong resources because I do not know exactly how I'll look for information about the topic focus I have decided on. (Item 56)	0.51					**0.520**
Item 38. I have no time to check whether I've missed a source about the topic focus I have decided on. (Item 62)	0.35		0.325			**0.456**
Item 43. I find it frustrating not knowing how to make a citation in an assignment or paper about the topic focus I have decided on. (Item 43)	0.44					**0.451**

[*] In these dimensions high values represent unfavorable while low scores are interpreted as favorable

[**] Item number in the trail form

[***] These items are scored negative