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Cognitive and motivational qualities of task instruction: Cognitive appraisals and achievement emotions of Swedish primary teacher students

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ABSTRACT

Given the crucial role of primary teachers in shaping pupils' development, equipping primary teacher students with the necessary skills, including information-seeking skills, is fundamentally important. The aim of this study is to gain a better understanding of the process of achieving such skills by exploring the interplay between cognitive appraisals and achievement emotions and the way in which these are affected by the quality of instructions experienced. Instruction librarians' support in relation to instructions and how these can be designed to promote achievement are also investigated.

Six Swedish primary teacher students were studied through in-depth semi-structured interviews over a period of 10 weeks. The methodological tool Geneva affect label coder was used for the mapping and categorization of appraisals and emotions. The analysis of the qualitative data was theory driven and deductively interpreted through the lens of Pekrun's control-value theory of achievement emotions, Scherer's semantic space of emotions, and Kuhlthau's information search process model.

The cognitive appraisals identified were uncertainty, certainty, and negative and positive intrinsic motivation. The achievement emotions found in relation to cognitive quality were anger/frustration, anxiety, and hopelessness, and those linked to motivational quality were enjoyment and boredom. Uncertainty and negative intrinsic motivation/failure elicited emotions related to cognitive quality, and negative/positive intrinsic motivation and certainty determined emotions related to motivational quality. The interplay between appraisals and emotions was complex, involving feedback loops and reciprocal causation. The support from instruction librarians experienced was related to the students' ability to master the instructions and their cognitive qualities.

The study has theoretical and methodological implications for information behavior and information literacy research in its application of appraisal theories and methodological tools. It also has practical implications for academic instruction librarians supporting students in the process of achieving information-seeking skills. By understanding how students experience support and the relations to the quality of task instructions, support can be designed in ways that promote positive achievement emotions and by implication achievement.

Introduction

Teachers have crucial responsibility for laying the foundation for pupils' future success, nurturing their well-being, and encouraging civic engagement and social responsibility. Consequently, educating teacher students and comprehending their learning processes, including the achievement of information-seeking skills and other literacies, are crucial. These skills are pivotal for academic success and future professional future practices as manifested by higher education information literacy frameworks and standards (e.g., [ACRL, 2015](#); [Bent & Stubbings,](#)

[2011](#)). In light of their future role as teachers of information literacies, although on another level, it is even more pivotal to gain insights into their achievement of information-seeking skills.

This article explores primary teacher students' achievement of information-seeking skills. Since these students are future educators, responsible for teaching young pupils during their crucial developmental years at school, it is imperative to understand their learning processes, including the achievement of information-seeking skills. Information-seeking skills are conceptualized in the study as the abilities to seek literature and evaluate its relevance. In addition, information-

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seeking skills are understood as normative outcomes of achievement and a core information literacy besides the abilities to identify the need for and use information (e.g., ACRL, 2015; Bent & Stubbings, 2011; Limberg et al., 2012).

The motivation for the study was derived from the observation by the author, an instruction librarian, of the emotional nature of the information-seeking and learning process and the accuracy of Kuhlthau's (1988a, 1988b) constructivist information search process (ISP) in describing it. In addition, the model sparked curiosity about the interplay between the cognitive (thoughts) and the affective (feelings) aspects within the process and the way in which this interplay is affected by task instructions. To gain a comprehensive understanding of this interplay, the study sought elucidation, interpretation, and deeper insights through the lens of appraisal theories. Thus, the study contributes to a better understanding of the way in which primary teacher students learn, particularly in the process of achieving information-seeking skills.

After reviewing the literature, the theoretical framework and research questions guiding the study are introduced. Then, the context, method, and tools for analysis are described, followed by the results and an analysis. Finally, the results are discussed, and a conclusion is presented.

Literature review

Emotions are a universal human experience, and everyone can relate to them. Nevertheless, the task of defining emotions is, as the appraisal theorist Scherer (2005, p. 695) described it, a “notorious problem” on which researchers have yet to reach a consensus. In an effort to define emotions, Shuman and Scherer (2014, pp. 15–16) proposed that they are short-lived episodes or events of significance for an individual that:

... consist of multiple components: a subjective feeling component, a motor component, a physiological component, an action tendency component, a motor activity component, and an appraisal component.

From this definition, it follows that emotions can have biological, neurological, and physiological theoretical underpinnings. Acknowledging these, the appraisal component is in focus in the study, the cognitive evaluation of a situation of significance for the individual, and how appraisal theories explain the nature of emotions. In cognitive psychology, appraisal theories assume that emotions are driven by appraisals, which affect the other components. Changes in appraisal affect the other components. The extent to which emotions contribute to the individual's well-being—positive/pleasant or negative/unpleasant—is appraised. If negative, further appraisal takes place, leading to more multi-dimensional emotional states (e.g., Ellsworth & Scherer, 2003; Lazarus & Smith, 1988; Shuman & Scherer, 2014).

Researchers (e.g., Pekrun, 2019; Pekrun and Linnenbrink-Garcia, 2014b) have noted that studies of the role of emotions in learning processes have increased during the last 30 years, in particular in higher education and from an educational psychology perspective. Two handbooks (Pekrun & Linnenbrink-Garcia, 2014a; Schutz & Pekrun, 2007) are examples of this growing interest as well as seminal appraisal theory contributions, such as Linnenbrink and Pintrich's (2002) asymmetrical bidirectional model and Pekrun's (2006) control-value theory of achievement emotions.

Emotions have been a subject of inquiry within the field of library and information science (LIS) research as well. Nahl and Bilal (2007) identified the emergence of an affective “paradigm” in LIS, while Hartel (2019) observed a subsequent affective “turn” in information behavior (IB) research. Nonetheless, the existing literature on emotions remains limited, as pointed out by various researchers (e.g., Dahlqvist, 2021a, 2021b; Krakowska, 2020; Lopatovska & Arapakis, 2011; Savolainen, 2015a). Despite this scarcity of research, valuable contributions in LIS and IB can be identified.

Nahl (2007a) recognized four distinct IB research areas in which

affective behaviors have been studied. The influence of social and cultural contexts on cognitive–affective relationships is one of the domains, and the exploration of the cognitive operations influenced by emotional control is another. Moreover, brain and neural system functionalities have been investigated, guided by affective neuroscience explanations, and, finally, information technology system design informed by studies of affective behaviors has been of interest in the affective computing and human–computer interaction (HCI) fields.

Lopatovska and Arapakis (2011) offered an LIS literature review focusing on information systems, information retrieval, and HCI. Theories of emotions applied in the literature were categorized after the structure and manifestation of emotions: the discrete and the continuous. In the discrete approach, the researchers argued that there are several basic general emotions. In the continuous approach, emotions are represented in multi-dimensional spaces wherein levels of arousal and valence are of interest.

In a more recent review, a qualitative content analysis, Krakowska (2020) identified 35 IB studies of affective phenomena research. The frequency of terms used in the literature was thematically clustered into categories within three overarching themes: topics and theories, methods used, and type of users. Six types of users, in which students appeared most frequently, were found. Literature analysis was the most applied method of the 21 discovered in the studies. Within the topics and theories category, emotions, in terms of positive or negative, formed the sub-category containing by far the most equivalent terms. Another category identified, the only one constituted by a model, was Kuhlthau's ISP model.

In another review, Dahlqvist (2021a, 2021b) thematically analyzed teacher students' information-seeking behaviors and information literacies, with a focus on research practices and information-seeking emotions. Four quantitative studies were identified, none of which investigated emotions in relation to assignments in which students should conduct some kind of independent research. New students' emotional experiences were investigated in a qualitative study and compared with those of Master's students and information experts (Tabatabai & Shore, 2005). In the other quantitative studies (Canan Gungoren et al., 2019; Çevik, 2015; Chen et al., 2019), teacher students' feelings, thoughts, and intentions in relation to their perceived searching strategy skills were investigated.

Studies of the specific emotion anxiety and the relation to students' encounters with libraries and how to use it for research tasks, have also gained LIS researchers' attention. The concept library anxiety was coined by Mellon (1986) to describe the phenomena. A substantial body of literature has been produced since then with studies of higher education students (e.g., Kwon, 2008; McPherson, 2015; Nieves-Whitmore, 2021), including teacher students (e.g., Erfanmanesh, 2011; Sharma & Attri, 2018; Shoham & Mizrahi, 2001).

Previous conceptual discussions and applications of appraisal theories in LIS are even more limited, particularly in information-seeking behavior research. Nahl's (2005) contribution, introducing the affective load theory (ALT), is prominent. Uncertainty and time pressure experienced are the appraisals that determine emotions, which affect cognitive processes. Savolainen's conceptual works have also offered some insights that draw on appraisal theories. Kuhlthau's information search process model was scrutinized in one study (2015a) and compared with Nahl's (2007b) social–biological information technology model in another (2015b). In a review, Savolainen (2016) applied an appraisal theory framework to analyze affective barriers and their impact on information-seeking activities.

The literature review shows that, in general, there is a lack of LIS studies on emotions. To a large extent, the literature has focused on HCI, information retrieval, and information systems, and IB research has been limited (Lopatovska & Arapakis, 2011; Nahl, 2007a). Moreover, IB studies have rarely referenced theories borrowed from cognitive psychology explaining cognitive–affective relationships, such as appraisal theories, and very few have studied higher education students

(Krakowska, 2020). Teacher students have only been investigated in four studies, and none of these related to research assignments as well as analyzing the results through the lens of appraisal theories (Dahlqvist, 2021a, 2021b).

Theoretical framework

The study is situated within a cognitive constructivist meta-theoretical (Case & Given, 2016; Talja et al., 2005) frame for the understanding of learning and achievement. Learning is viewed as an individual’s process of making meaning and understanding the world based on their own cognitive and affective experiences.

To understand the interplay between cognitive and affective behaviors in the constructivist achievement process, the study turns to appraisal theories for conceptual guidance and explanations: the control–value theory of achievement emotions (CVT) and the semantic space of emotions (SSE). The CVT also outlines how the achievement context, with task instructions and support and achievement processes, affects the cognitive–affective interplay. Dahlqvist (2022) has discussed the relevance of applying the CVT and SSE in relation to the achievement of information-seeking skills more thoroughly elsewhere.

Moreover, Kuhlthau’s (1988c, p. 421) groundbreaking ISP model, built on constructivist learning theories (Bruner, 1986; Dewey, 1933; Kelly, 1963), provides an LIS and IB understanding and the study’s assumption of cognitive and affective experiences as the processes part of the cognitive constructivist learning process. Although the study focuses on seeking as the object of learning rather than the means of learning, the model contributes concepts for analysis.

The control–value theory of achievement emotions

Pekrun’s (2006) control–value theory of achievement emotions (CVT), with some modifications (Pekrun et al., 2007a; Pekrun & Perry, 2014), integrates several theoretical approaches (e.g., motivational, goal attainment, self-regulation of learning, and expectancy theories). The basic assumption of the CVT is that emotions have a fundamental impact on the achievement process, with positive emotions having a positive effect and negative emotions a negative one. Another assumption is that this process involves certain emotions that otherwise would not be present, and a third is that these achievement emotions are the result of control and value appraisals.

Pekrun and Perry (2014, p. 320) defined achievement emotions as being “tied directly to achievement activities (e.g., studying) or achievement outcomes (success and failure).” Besides retrospective outcome emotions, which are experienced after achievement, two types of achievement emotions are involved in the learning process: activity and prospective outcome emotions.

Activity emotions are experienced when the attentional focus is on activities and actions. When directed toward a future expected outcome, prospective outcome emotions are experienced. Specific structures of interplay between appraisals are posited to determine specific

Table 1
Prospective outcome emotions with appraisals.

Object focus	Outcome expectancy (value appraisals)	Outcome control expectancy (control appraisals)	Emotions
Outcome, prospective	Success	High	Anticipatory joy
		Medium	Hope
		Low	Hopelessness
	Failure	High	Anticipatory relief
		Medium	Anxiety
		Low	Hopelessness

Table 2
Activity emotions with appraisals.

Object focus	Intrinsic value (value appraisals)	Control (control appraisals)	Emotions
Activity	Positive	High	Enjoyment
	Negative	High	Anger
	Positive/negative	Low	Frustration
	None	Low	Boredom

achievement emotions. These relationships are shown in Tables 1 and 2 (Pekrun, 2006, p. 320).

For prospective outcome emotions, the value appraisals—expected success and failure—interact with the control appraisals of the expected outcome on different levels. Together, they elicit specific emotions (see Table 1).

For activity emotions (see Table 2), specific emotions are functions of the perceived ability to control actions and the inner motivation of performing the activities or their subjective intrinsic values.

Elements and structure of the theory

Fig. 3 shows the adopted version (Pekrun, 2006, p. 328) of the structure of the CVT with the elements of achievement context with a focus on task instructions and support, cognitive appraisals, achievement emotions, and learning and achievement. The elements do not only follow a linear sequential progression. Reciprocal causation and feedback loops tie the elements together, making the relations between them dynamic and complex.

Cognitive appraisals and achievement emotions

Besides the linear relations between the elements of appraisals and emotions described above and the impact that emotions have on learning and achievement, both appraisals and emotions affect the achievement context through feedback loops. The interplay between appraisals and emotions is specifically intricate, involving both feedback loops and reciprocal causation. For example, increased perceived control generates positive emotions, enhancing control appraisals and resulting in more and higher-intensity positive emotions. Following the same logic, low-control appraisals result in negative emotions, decreased control, and even more and intense negative emotions. The feedback loops and reciprocal causation imply that negative appraisals which have not changed to the positive, for example through clearly formulated instructions, and lead to negative emotions, can have a long-term negative impact on learning and achievement.

Achievement context

The achievement context—task instructions and support—shapes emotions, mediated by appraisals. Task instructions include the defined achievement goal and learning material the support, referring to the resources provided in the achievement process: lectures, supervision, and other support. Task instructions and support together contribute to students’ experiences of the cognitive and motivational qualities of task instructions.

Cognitive quality refers to the perceived abilities to master and have control over instructions, and motivational quality means the intrinsic value of and interest in following them. Thus, cognitive quality implies the control appraisal and motivational quality the intrinsic value appraisal. The cognitive and motivational qualities affect each other, and positive qualities elicit positive achievement emotions that are beneficial for achievement, while negative qualities result in negative achievement emotions, impeding achievement.

Learning and achievement

The learning and achievement processes affect the other elements of the theory. Cognitive attention, learning strategies, and motivation to learn are part of these processes. Self-regulation of learning is

considered a learning strategy that is specifically important for achievement success. Task instructions, enabling students to regulate their achievement processes, are assumed to increase their perceived motivational quality.

The semantic space of emotions

Scherer (2005) suggested that Russell’s (1980) classic two-dimensional circumplex model of emotion, comprising a valance (positive–negative) and an intensity (calm–aroused) dimension, could be developed. By adding appraisals of control (low–high) and expected goal attainment (conductive–obstructive), a four-dimensional model was the result, the semantic space of emotions (SSE). The model complements the CVT, nuancing the control appraisal as obstructive or conducive as well as describing the qualities of emotions in terms of valance and intensity. A modified version (Scherer, 2005, p. 720) is presented in Fig. 2.

According to Scherer (2005), natural language expressions of emotions, the subjective feeling component, is the most accurate way to capture the qualitative variation of emotions. The expression of specific feelings has its location in the SSE and is defined by its quality across the bipolar dimensions. Closely related emotions are grouped into emotion categories, meaning that there are variations within them. These affect categories are found in the SSE’s complementary methodology tool, the Geneva affect label coder (GALC) (Scherer, 2005, pp. 714–715). The close relationship between appraisals and emotions means that appraisals are also found in the SSE and GALC.

Information search process model

The model describes the cognitive and affective experiences in the information-seeking process. Developed (Kuhlthau, 1988a), confirmed

(Kuhlthau, 1988b, 1988c) and verified (Kuhlthau, 1989), the latest version consists of six stages, integrating the processes of the cognitive and affective realms. Fig. 1 illustrates the model, focusing on the realms of feelings and thoughts (Kuhlthau, 1988c, p. 421).

Aim and research questions

The aim of the study is to increase the understanding of primary

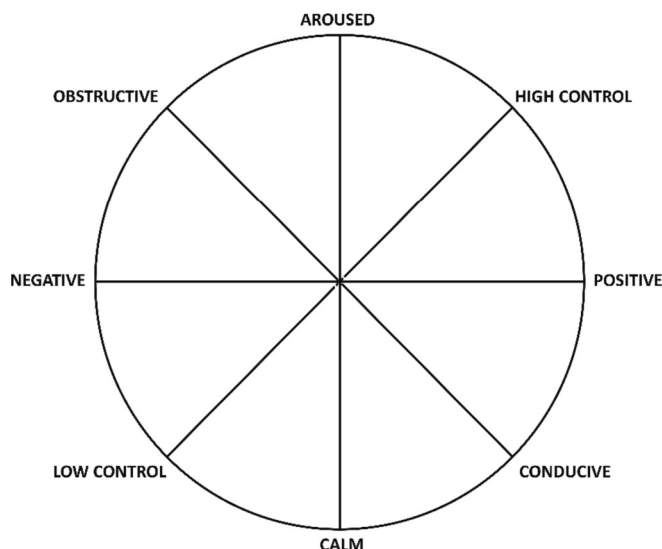


Fig. 2. Scherer’s semantic space of emotions (SSE).

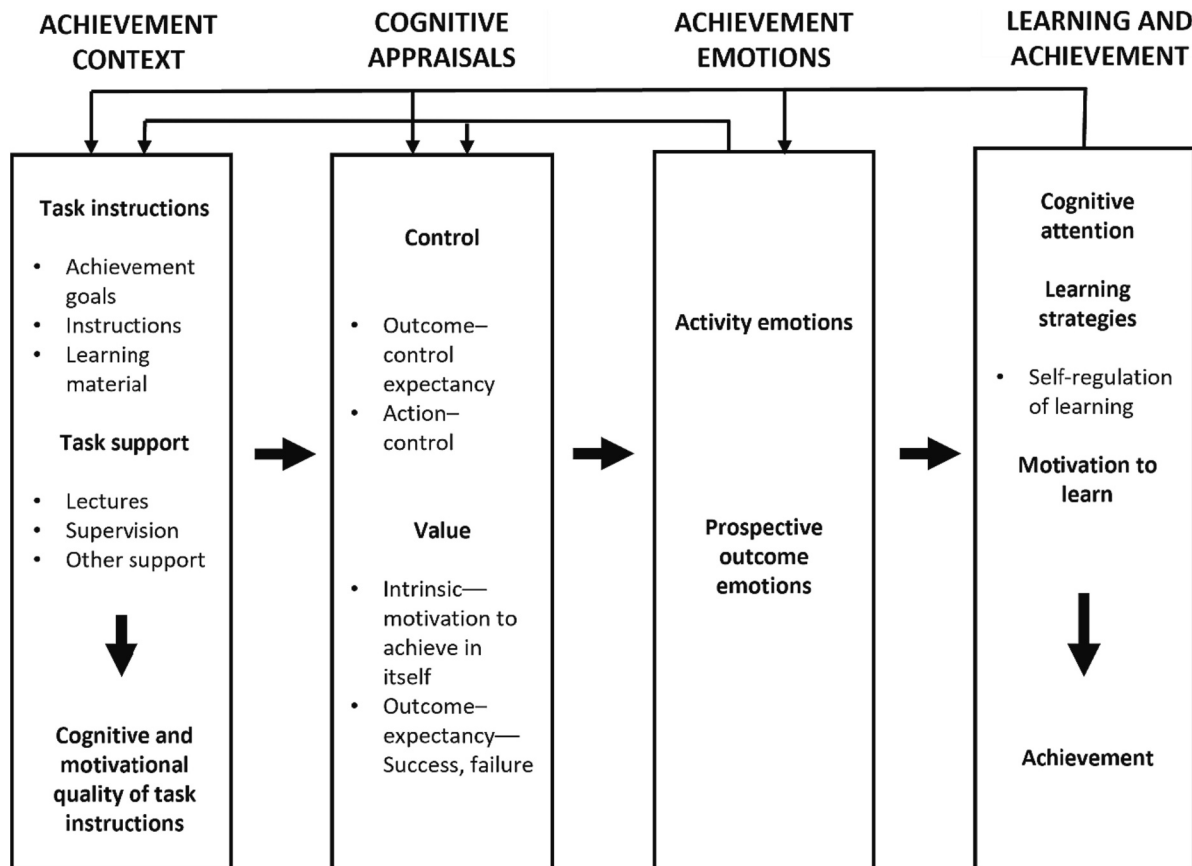


Fig. 1. Control-value theory of achievement emotions (CVT).

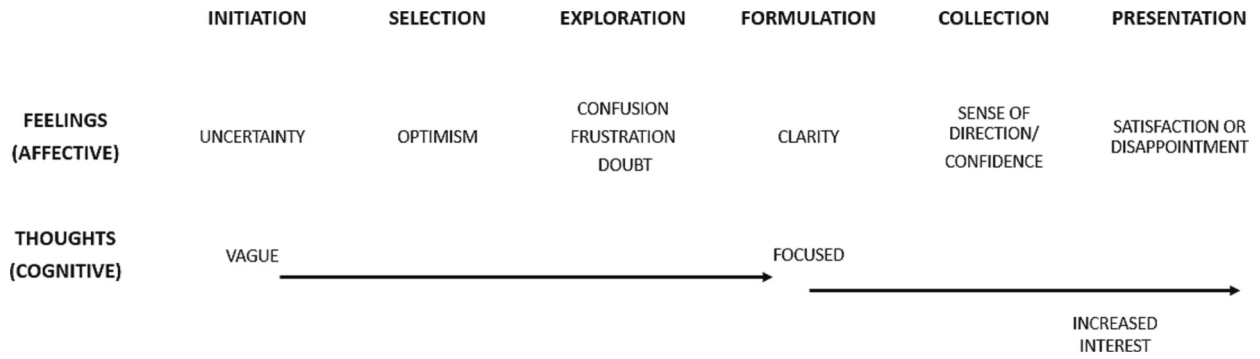


Fig. 3. Kuhlthau's information search process (ISP) model.

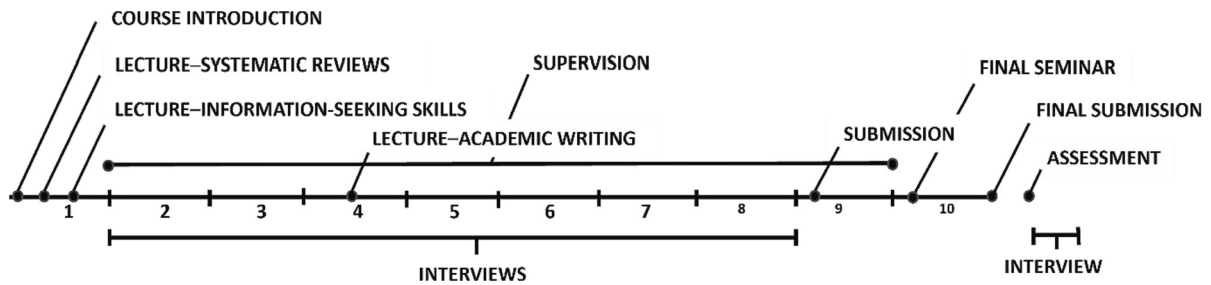


Fig. 4. Timeline: learning activities and interviews.

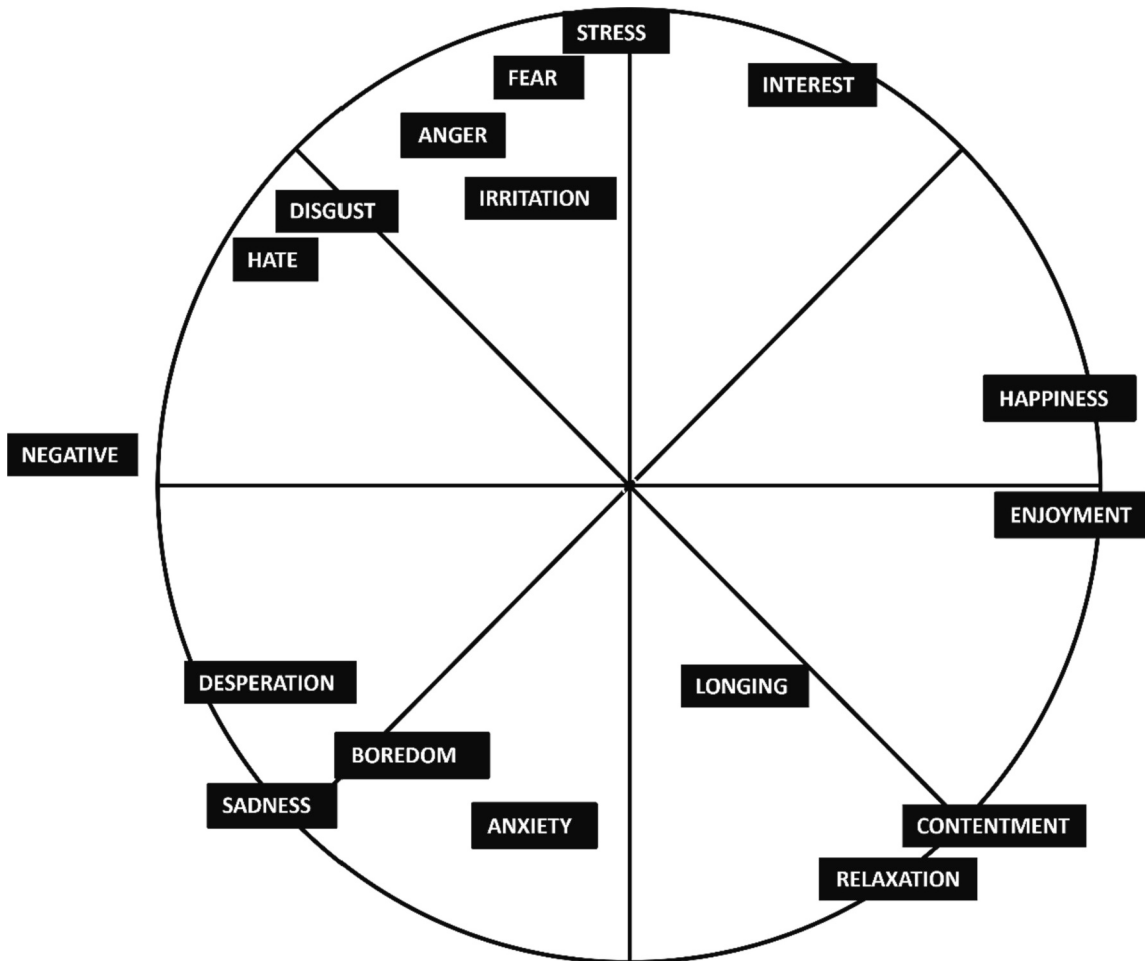


Fig. 5. The semantic space of the information-seeking GALC categories.

teacher students' learning processes in formal educational contexts. In particular, the purpose is to gain deeper knowledge of students' experienced quality of task instructions when the goal is to achieve information-seeking skills and the way in which this quality affects the interplay between cognitive behaviors and emotions and, by implication, learning and achievement. Moreover, the intention is to understand better students' experiences of support from instruction librarians in relation to task instructions and, consequently, gain insights into how support can be designed, thus providing instruction librarians with valuable knowledge in their professional instruction practices.

To obtain this deeper understanding, Swedish primary teacher students are studied with the guidance of appraisal theory explanations and concepts. The research questions (RQs) that the study seeks to answer are as follows:

RQ 1: What cognitive appraisals and information-seeking achievement emotions do Swedish primary teacher students experience in relation to the experienced quality of information-seeking skills task instructions?

RQ 2: How do cognitive appraisals and information-seeking achievement emotions interplay in relation to the experienced quality of information-seeking skills task instructions?

RQ 3: What experiences do the students have of support from instruction librarians in relation to the experienced quality of information-seeking skills task instructions and how can the support be designed to promote these experiences?

Method

This study is part of an empirical study of students enrolled on a course in a primary teacher education program at a Swedish university. The aim of the 10-week task was to conduct a knowledge overview (KO), the literature review part of the exam thesis. The KO was conducted semester seven of eight during the fourth and final year of the program. The task was to independently and individually (or in pairs) search for literature on chosen subjects of interest which they were required to investigate the final eighth semester, the empirical part of the exam thesis. The students were followed over 10 weeks with the aim of discovering qualitative variations in identical achievement contexts.

With the ambition to explore, discover, and obtain an in-depth and nuanced understanding of the students' experiences, a qualitative approach was chosen. More specifically, a qualitative longitudinal method was applied, meeting the same individuals on several occasions and capturing "real-time" experiences over time (Neale, 2020). However, the focus in this study was on the students' experiences of task instructions, which did not evolve over time.

To obtain in-depth and nuanced qualitative data that capture the subjective and individual experiences of students, semi-structured interviews were utilized. These interviews were intentionally designed to be less structured, allowing the students the freedom to elaborate and reflect upon open-ended questions and topics. This form of verbal communication, in which the interviewer gathers information from the interviewee through questioning, is a well-established approach to capturing individuals' experiences and their understanding of the world through their natural language expressions (Case & Given, 2016; Kvale, 1996; Merriam & Tisdell, 2016).

Participants and setting

The course's 25 students were invited to participate during the course introduction and informed of the aim of the study and the conditions for participating. Given the longitudinal process approach of the main study, a small sample of five to 10 students was considered sufficient (Neale, 2020). Six students agreed to participate, one male and five females. They gave informed consent and received anonymized names. In Table 3, the participants' anonymized names as well as gender and age are presented. Four of the students conducted the KO in pairs, Ann/Tom

Table 3

Participants' anonymized names, gender, and age.

Name	Gender	Age
Jane	Female	30
Ann	Female	38
Tom	Male	32
Sue	Female	31
Pam	Female	38
Ruth	Female	50

and Sue/Pam. Thus, four KOs were followed.

The learning activities during the course were lectures, supervisor meetings, and final seminars with defence and opposition of the KOs (see Fig. 4). Instructions, besides the achievement goal, were provided in the learning management system (LMS): study guidelines and other learning materials, examples of KOs from former students, and systematic literature reviews. The author led the information-seeking skills lecture and two occasions of individual support with a peripheral role, which was clearly stressed, meaning no contact with teachers and supervisors and no involvement in learning design, supervision, and assessment.

The information-seeking skills achievement goal was formulated as follows: after completion of the course, the students "should be able to seek information in a structured way and make a relevant selection of research within the chosen research area." In addition to the instruction implied by the achievement goal, the study guidelines provided specified instructions:

Describe how you have conducted the knowledge overview: Which databases have you used? What search strategies and search terms have you used? How have you made the selection? On what grounds have you included and excluded?

Data collection

Over the course of 10 weeks, the students were followed and interviewed on seven to eight different occasions, resulting in a total of 31 interviews (see Table 3). Data were gathered amidst the COVID-19 pandemic in the spring of 2021; therefore, the interviews were conducted via Zoom, resulting in digital audio files, which were transcribed. Having a high level of English language proficiency, the author then translated the transcripts from Swedish into English, since the results was going to be available for English readers. The transcripts underwent light editing, which involved excluding irrelevant elements from the conversation, such as fillers (e.g., uh, um, and eh), pauses, and repetitions. Otherwise, the transcripts and the quotes presented in the Results and analysis section were literal. In those cases where Swedish idioms and expressions are presented, footnotes are provided for clarification. In Table 4, the interview occasions with duration for each KO are provided.

The students were asked to describe their emotional experiences during the past week in relation to the task instructions as defined above. No strict interview guide was followed. The interviews were relaxed, informal conversations, allowing flexibility and possibilities for the students to elaborate and reflect.

Data analysis and coding

Data analysis is a creative process whereby the researcher moves between inductive and deductive approaches, interpreting and analyzing the qualitative data (Merriam and Tisdell, 2016). The analysis followed a deductive and theory-driven approach, although it incorporated elements of induction. NVivo was employed to code and categorize the data, necessitating extensive interpretation and careful deliberation throughout the process. As familiarity with the data deepened, multiple iterations of merging and splitting codes were performed.

Table 4
Interview occasions for each KO with students and duration.

Week	1	2	3	4	5	6	7	Follow up	
Jane	63 min	55 min	55 min	35 min	17 min	27 min	–	19 min	4 h 31 min
Ann/Tom	54 min	59 min	55 min	66 min	62 min	56 min	50 min	40 min	7 h 22 min
Sue/Pam	55 min	50 min	56 min	59 min	64 min	57 min	63 min	26 min	7 h 10 min
Ruth	58 min	53 min	57 min	64 min	61 min	62 min	65 min	24 min	7 h 24 min
								Total	26 h 27 min

Table 5
Steps 1–3 of the data analysis process: feelings, GALC categories, and phrases/words implying GALC categories.

1. Feeling concept/code (in vivo) Truncated word stems indicated with *	2. GALC category	3. Affect category implied (examples): phrases/words expressing feelings
Anger (ang*) Frustration (frustrat*) Rage (furious)	Anger	“One hell of a learning outcome”; “Damn!”
Anxiety (anx*) Worry (worr*) Boredom (bor*) Comfortable (safe, secure) Hopelessness (discouraged)	Anxiety Boredom Contentment Desperation	“I had heart palpitations”; “Made me all sweaty” No No “I have nothing, it really isn’t enough”; “Like punching a hole in a balloon”
Disgust (aversion) Fear (afraid, scared, horr*, dare) Panic (panic*) Happiness (delight, happ*) Hate (hat*) Interest (interest*) Irritation (annoyed, irrita*) Longing (long*) Enjoyment (enjoy*, happy, excited, fun) Calm (calm*)	Disgust Fear Happiness Hate Interest Irritation Longing Enjoyment Relaxation	No “You don’t dare” No No No No No No “It settled down”; “Not so stressed”
Dejected (dejected, sad) Stress (stress*) Negative (negative)	Sadness Stress Negative	No No No

In the first step (see Table 5) of the analysis, students’ feelings, the subjective emotional experience, and appraisals were inductively coded verbatim, or “in vivo,” as Saldaña (2013) described it. Saldaña also recognized emotion coding as a distinct form of coding that considers the vocal expression or how something is expressed. In the second step, the feelings were categorized deductively based on the GALC categories (Scherer, 2005, pp. 714–715). Appraisals were, in the first step (see Table 5), mapped deductively based on the GALC categories and appraisal concepts in accordance with CVT appraisals. In the second step, the CVT appraisals were translated into the appraisal concepts applied in the study.

In the third step (see Tables 5 and 6), metaphors/phrases/words were identified and coded based on the affect categories and concepts discovered in the preceding step. Moving on to steps four and five, the affect categories, partly informed by their closeness in the SSE, were mapped onto the corresponding achievement emotions in the CVT, which, in turn, led to the final identification of achievement emotions in the study (see Table 7).

Finally, passages in which the students’ perceptions of task instructions were expressed were assigned codes. Cognitive appraisals and achievement emotions within these passages were then identified for further analysis.

Results and analysis

The first three steps in the data analysis process for the identification of cognitive appraisals and information-seeking achievement emotions

Table 6
Steps 1–3 of the data analysis process: appraisals (category), type, and phrases/words implying type.

Appraisal CVT	1. Appraisal concept/code (in vivo). Truncated word stems indicated with *	2. Appraisal type study	3. Cognitive appraisal implied (examples): Phrases expressing appraisal type
Low control	Confusion (confus*) Uncertainty/doubt Negative (see Table 5) Stress (see Table 5)	Uncertainty	“How many articles do we need?”; “What are we supposed to document?”; “What do you want?”; “I can’t do this”; “This is difficult”
High control	Contentment (see Table 5) Relaxation (see Table 5)	Certainty	No
Negative intrinsic value Positive intrinsic value	Low motivation (not fun) Hatred (see Table 5) Interest (see Table 5) Motivation (looking forward to, going to be fun) Longing (see Table 5)	Negative intrinsic motivation Positive intrinsic motivation	No No

Table 7
Steps 4–5 of the data analysis process: information-seeking achievement emotions.

Achievement emotion CVT	4. GALC category	5. Achievement emotion study
Anger, frustration Boredom Enjoyment	Anger, irritation Boredom Enjoyment, happiness	Anger/frustration Boredom Enjoyment
Anxiety Hopelessness	Anxiety, fear Desperation, sadness	Anxiety Hopelessness

with results are presented in Table 5. All the feelings expressed verbatim by the students and their categorization according to the GALC categories are presented. Feelings expressed through words/phrases within the GALC categories are also shown.

The locations of the 17 identified GALC categories in the SSE are presented in Fig. 5. They are spread out across the SSE, showing the quality of the category in terms of valance and intensity as well as their place across the appraisal dimensions.

Cognitive appraisals

Low and high (not medium) CVT control appraisals emerged as the most relevant to identity. The GALC categories found close to the calm and conducive endpoints in the SSE control dimensions were shown to be proper concepts capturing the high-control appraisal (see Table 6), as was the negative category in the valance dimension, in accordance with the notion of unpleasant/pleasant as the first appraisal check of an event (Shuman & Scherer, 2014). In addition, stress, close to the endpoints aroused and obstructive and opposite calm and conducive in the SSE, was found to be a low-control appraisal, which is also in line with the

theoretical assumptions of stress as the initial appraisal antedating secondary appraisals (Folkman et al., 1986; Lazarus & Smith, 1988).

Finally, uncertainty was considered to be the best concept capturing low control and consequently certainty the opposing concept describing high control. The value appraisals were directly translated from the CVT, although value was labeled as motivation. Table 6 presents steps 1–3 in the data analysis process, in which the appraisals expressed verbatim are categorized according to concepts and GALC categories for each CVT appraisal. Hatred and longing were not interpreted in their literal sense but as spoken language expressions. Appraisals expressed through phrases within categories are also shown in the final third step.

Information-seeking achievement emotions

Table 7, continuing from Table 4, shows the process for the identification of achievement emotions in the study. The GALC categories were mapped to the achievement emotions derived from the CVT and finally given the achievement emotion label applied in the study. Boredom was directly linked to corresponding achievement emotions, both in the CVT and in the study. Irritation, located close to anger in the SSE, and anger (encompassing frustration) were interpreted as being equivalent to frustration and anger in the CVT and translated into anger/frustration in the study. Happiness, near enjoyment in the SSE, was considered enjoyment in the CVT and the study. Desperation, encompassing the CVT emotion hopelessness, along with sadness, constituted hopelessness in the study. Finally, fear, not interpreted literally, was identified as anxiety in the CVT as well as the study.

Quality of task instructions

In the following, the appraisals and achievement emotions experienced for each quality type are presented separately with illustrative quotes.

Cognitive quality of task instructions

The students' experienced cognitive quality of the instructions gave rise to negative emotions: the activity emotion anger/frustration and the prospective outcome emotions anxiety and hopelessness. However, uncertainty and certainty did not always elicit emotions. Jane wondered at one point how much literature she needed to "look up," and Sue sought guidance on what to document from the study guide but was not helped:

It is not included there as clearly as it has been presented now at the beginning. It makes you a little confused. Do we need to write it, or can we just say that we have written it?

Likewise, the examples of systematic reviews were confusing for Pam:

This is how you should do, but you should not do that and so I become like: why do you tell me what not to do? I don't understand. No, say what I should do!

Jane experienced certainty that did not result in any emotion, thinking that the KO examples were helpful:

We have four different examples that look completely different, so I feel that we can decide ourselves. Just that they differ so much, so you feel that then we can't do wrong.

Anger/frustration. Anger/frustration was experienced by Ann, Pam, and Ruth. Anger and frustration are two separate emotions in the CVT, making all the combinations of uncertainty/certainty and negative/positive intrinsic motivation possible in eliciting anger/frustration. For Pam and Ruth, anger/frustration was the result of uncertainty and implicit negative intrinsic motivation. For Ann, though, it was elicited by uncertainty and despite having positive intrinsic motivation.

Ann was "irritated" by the instructions because of being "super stressed" and due to the uncertainty about what was "enough" literature to search for:

I don't care about this, when you don't get it explained. Damn university!

For Pam and Ruth, anger/frustration contributed to prospective uncertainty resulting in anxiety. In Ruth's case, it also resulted in hopelessness and boredom. Thus, having the function of enforcing uncertainty, triggering other emotions and showing, as posited in the CVT, feedback loops were emotions affecting appraisals.

Pam thought that the instructions were "completely diffuse"¹ which made her frustrated, in turn leading to anxiety:

I also feel huge frustration: what do you want? You hardly dare to do anything for it should really be by the book, but then it should only be partially. And when you don't find anything, it goes into frustration and a bit of panic and then you kind of start picking whatever you find.

For Ruth, it came as a "shock" that the importance of the information-seeking skills achievement goal was emphasized:

Damn, it's all about searching! There has been nothing that has been prepared for this. We have not searched for anything like this in any course before.

Ruth thought that the demands were far too high, with "incredible expectations that you absolutely cannot meet." This uncertainty did not only affect her anger/frustration; all her negative emotions were a consequence of this uncertainty. In retrospect, she metaphorically described her experiences:

A very big suit is sewed up. And it's way too big. It just hangs down on a tiny little student somehow. The arms and legs are too long. [...] And we kind of don't have muscles and length to fill it. And it's not because we're stupid and bad but because we have not kind of built up our academic knowledge enough.

Although understanding that it is useful to "have some idea" of databases and searching, Ruth was "furious" about the "double messages." Furthermore, she was "annoyed when it's portrayed as something big and how incredibly important and how outstanding you should be as a teacher":

First, we should pretend to be researchers and in the middle of all that we should also pretend to be librarians. I was incredibly angry. It's just one hell of a learning goal out of many, but it should just take all the space!

Anxiety. All the students but Sue experienced anxiety. Anxiety has, by definition, an inherent uncertainty appraisal, and it cannot be experienced without uncertainty regarding a future outcome. Uncertainty alone led to anxiety for all except Ruth and without, as stipulated in the CVT, expectations of failure.

Jane thought the instructions were "a little vague," but that was not something unique to the KO. Every course start "entails a type of anxiety," but she was confident of success in the end:

I usually learn over time; we are so used to it. It is not really anything unusual with a little bit of heart palpitation in the beginning. I feel quite calm about that part; it usually goes well.

Initially, uncertainty about what Ann interpreted as being the task's purpose "to fill the knowledge gap" made her "scared" and led to "some panic":

¹ Diffuse in Swedish spoken language mean that something is unclear or "messy".

Are we supposed to know this already? [...] How can you ask for that from us? That feeling was overwhelming.

The confusion experienced by Ann and Tom, looking at the examples from previous KOs, resulted in “anxiety.” Ann reflected on how they had affected them in hindsight:

They are not helpful at all. They gave us anxiety because it was on so many pages that you just: is this what we’re expected to do? [...] All four are from our university, but four completely different arrangements. [...] So, I just found them confusing.

In addition, Tom’s insecurity concerning what to document led to “panic”:

I think somewhere has this panic, that we don’t really understand or know what’s expected of us when we’re going to present the method. What are we going to document? All the search strings we have?

Pam’s “panic” and Ruth’s “worry” were the result of uncertainty enforced by anger/frustration. For Ruth, anxiety was additionally the result of failure expectations. She was also “all sweaty” when looking at the example thesis, unsure of being able to document the searches that detailed.

Hopelessness. Only Ruth experienced hopelessness. As with anxiety, hopelessness toward outcomes implies uncertainty about them, and this uncertainty was, in accordance with the CVT, combined with failure expectations, resulting in her hopelessness. Ruth’s anger/frustration enforced the uncertainty, and she expressed her hopelessness as being “discouraged” and “sad.” The way in which she expressed it, the vocality, indicated the level:

There was like no one who signaled that this is really difficult, you may not be able to handle this [...] It hasn’t happened to me before. I’ve had difficult courses; what am I going to get from this or what does the teacher want? But not in this way, I have nothing to pick out of myself [...] This is not possible.

Motivational quality of task instructions

The students’ experienced motivational quality of the instructions resulted in the activity emotions enjoyment and boredom.

Enjoyment. All but Sue enjoyed the task and its instructions. Enjoyment was the result of the, by definition, inherent positive intrinsic motivation solely and not, as suggested by the CVT, in combination with certainty.

Jane was excited and had “been longing for” the independence, thinking that it was “fun to write and do this!” Likewise, Ann and Tom were excited and enthusiastic about conducting the KO reflecting their interests. Ann thought it was “great fun” and relished the chance to show: “who am I?” Tom described it as follows:

Now we have the chance to do something on our own. That’s motivating. That our interest will show. That is fun I think.

Ruth was also looking forward to being able to “dig a little” and thought initially that it was “really fun” to “geek out” on a topic reflecting her interest. Pam thought it would be “interesting” but had mixed feelings, describing it as “a bit of horror mixed with delight.”

Boredom. Sue and Ruth experienced boredom. The CVT assumes that boredom is the product of uncertainty and no value. However, both were not indifferent to the activities, finding them to be important for succeeding in obtaining the grade. Rather, negative intrinsic value had an impact on experienced boredom.

For Sue, her strong negative intrinsic motivation “hating” and having a “strong aversion” to the exam thesis in general were enough to elicit boredom:

Why do I have to do this? I just want to go out and work. This is something that I see as a necessary evil to get my degree. I hate this part. I think that writing a thesis is among the most boring things there is.

For Ruth, her anger/frustration affected uncertainty and, together with negative intrinsic motivation, resulted in boredom, which in turn affected her intrinsic motivation. Thus, boredom was involved in both a feedback loop and reciprocal causation and examples of such relations between emotions and appraisals, as suggested by the CVT.

When I’ve learned other things, I’ve found this exciting, and this was really interesting. But now, it was like punching a hole in a balloon² [...] These were just boring articles [...] It’s not fun to feel like this was boring.

Support from instruction librarians

From the structure of the CVT outlined in Fig. 3 (Pekrun, 2006, p. 328), it follows that the achievement context with task instructions and support shapes the experienced quality of instructions and by implication appraisals and emotions, which in turn affected learning and achievement. Consequently, the CVT suggests that support from instruction librarians can be designed in ways that increase students’ experienced cognitive and motivational qualities of task instructions for information-seeking skills that, as a consequence, promote positive cognitive appraisals and achievement emotions that are beneficial for the achievement of information-seeking skills.

The students suggested that learning activities and support earlier in training would have been helpful, indicating that instruction librarians could have been involved in preparing them for the task with instructions and increasing their abilities to master them. In addition, the students explicitly expressed that more information-seeking skills support with the actual task would have affected their control over the instructions as well as the resulting achievement emotions.

Information-seeking skills support during training

Ruth was totally unprepared for the task and instructions, implying that such support would have been of significance:

There has been nothing that has been prepared for this. We have not searched for anything like this in any course before. And there is no one who has said that this will be an important moment.

Likewise, Pam did not think she was equipped with sufficient abilities and had suggestions on how she could have obtained them:

I think that the search process itself should have been given more time in the training. Before every course, there should be a part where you should search for some scientific articles [...] so that you do not have that worry in the exam paper project.

Similarly, Sue had recommendations based on previous studies. Then, searching for scientific articles was taught at early stages during training, and she “knew what to search for, sitting the exam paper later.”

Information-seeking skills support with the task

Ann and Tom experienced that the individual support from the instruction librarian had a direct effect on their ability to master the instructions. For Tom, the stress “settled down,” and Ann’s anxiety decreased:

There is help available and then you should use that help instead of us getting into this stress level again and feeling that we don’t know what we are doing and getting anxious and stressing each other out.

² “Like punching a hole in a balloon” is an idiom in Swedish spoken language meaning that motivation decrease.

Ruth experienced being “left” with the task instructions and having to “sort it out” on her own, implying that more support would have been beneficial, although she received individual support on two occasions. On the first, meeting a librarian specialized in other subjects, the support did not help, making her angry:

Damn, you should know this! This is your profession!

The second time, being helped by a librarian with expertise in the educational sciences, she was more satisfied with the support.

Ann and Pam had suggestions for how librarians could be more engaged. Ann would have liked “another opportunity with the librarian” and the chance to feel “safer and more secure.” Pam had similar thoughts, mentioning that the information-seeking skills lecture “was really useful, such tips and tricks,” although more support would have been helpful:

There should have been more occasions where the librarian goes through this with different exercises. It’s a different mindset you must have. Sitting alone, you get stuck, how should I move on?

Ann and Pam also had ideas about how instruction librarians could offer more individual support. Ann suggested that:

A librarian could have somehow followed along or checked in halfway through. How are you doing? What have you come across? What obstacles?

Pam had similar thoughts:

It might have been included that you have had a supervisor in the search part. Just to kind of be able to discuss and move on. I think it would have been a good thing.

Discussion

The aim of the study is to increase the understanding of students’ experienced quality of task instructions in the process of achieving information-seeking skills and how this quality affects the interplay between cognitive behaviors and emotions and by implication learning and achievement. In addition, the goal is to gain knowledge of students’ experiences of support from academic instruction librarians in relation to perceived task instructions and, consequently, to obtain insights into how librarians can provide relevant and high-quality support.

To obtain this deeper knowledge, Swedish primary teacher students were studied with the guidance of appraisal theory concepts and explanations as well as the terminology found in Kuhlthau’s ISP model. In the following, the results of the study’s research questions are discussed as well as the practical implications that they have for practicing academic instruction librarians.

What cognitive appraisals and information-seeking achievement emotions do Swedish primary teacher students experience in relation to the experienced quality of information-seeking skills task instructions?

In total, 17 (see Table 4 and Fig. 5) of the 36 GALC affect categories (Scherer, 2005, pp. 714–715) were identified in the study in relation to the students’ experienced quality of instructions. Of the 17 affect categories, eight were identified as cognitive appraisals (see Table 5) and nine as information-seeking achievement emotions (see Table 6).

Guided by the CVT (Pekrun, 2006, p. 320), four cognitive appraisals were identified. The medium control appraisal for anxiety in CVT was not identified, and, instead of labeling control as high and low, uncertainty and certainty were identified as proper concepts. Motivation was used instead of value for conceptualizing the identified value appraisals: high and low intrinsic motivation. The no-value appraisal eliciting boredom was not present. Cognitive appraisals were identified with the help of the locations across Scherer’s (2005, p. 720) SSE, and Kuhlthau’s (1988c, p. 421) ISP model offered proper and descriptive concepts.

Anger/frustration, anxiety, hopelessness, enjoyment, and boredom were the information-seeking achievement emotions finally identified. In comparison with the CVT (Pekrun, 2006, p. 320), hope, anticipatory joy, and relief were not identified. Anger/frustration, anxiety, and hopelessness were tied to the cognitive quality of instructions and enjoyment and boredom to the motivational quality.

Compared with Kuhlthau’s ISP model (see Fig. 3), the inspiration behind the study and its provider of concepts, the thought “realm” can be viewed as the equivalent to appraisals. Thoughts progress from vague to focused through the initial stages and then to increased interest in the final stage. Vague/focused and increased interest might be regarded as compatible with the uncertainty/certainty and positive intrinsic motivation appraisals in the study.

Two additional emotions were identified in relation to the ISP model: boredom and enjoyment. Of the nine feelings found in the affective “realm,” four are appraisals in the study: uncertainty, confusion, doubt, and clarity (analogous to comfortable). The common emotions are frustration (anger/frustration) and disappointment (hopelessness). In addition, Kuhlthau (2004, p. 92) found that anxiety was an “affective symptom” and was viewed as a consequence of emotions rather than an emotion. Optimism and confidence in the model were not identified in the study.

Kuhlthau (2004, p. 92) identified uncertainty as the main factor affecting the learning process, formulated in her famous principle. Uncertainty was the appraisal with the most impact in the achievement process in the study as well, confirming the accuracy of the principle.

How do cognitive appraisals and information-seeking achievement emotions interplay in relation to the experienced quality of information-seeking skills task instructions?

The students’ experiences of the quality of instructions, as defined by the CVT (Pekrun, 2006; Pekrun et al., 2007b; Pekrun & Perry, 2014), implied control and value appraisals. The cognitive qualities had inherent uncertainty and the motivational ones an implicit positive or negative intrinsic value appraisal, resulting in information-seeking achievement emotions. Although intricate and dynamic, the level of complexity assumed in the CVT (Pekrun, 2006, p. 320), in which there is always an interplay between control and value appraisals, were not shown and the same appraisals were not always involved.

In Table 8, the CVT equivalent appraisals are found and the appraisals triggering each emotion (grouped after the quality type) for each student in the study are indicated in grey and by their initial letter (s): uncertainty (U), certainty (C), negative (N), positive (P) and intrinsic motivation, failure (F), and no value (No).

Cognitive quality of instructions

Uncertainty and certainty appraisals related to the students’ experienced cognitive quality of instructions did not always result in emotions. From an SSE and ISP model point of view, the appraisals encompassed emotions, suggesting that uncertainty and certainty in themselves could be explained with different appraisal theory

Table 8
Quality type, cognitive appraisals (in grey), and information-seeking achievement emotions.

	Cognitive quality			Motivational quality	
	Anger/frustration	Anxiety	Hopelessness	Enjoyment	Boredom
CVT	UC/NP	U/F	U/F	C/P	U/No
Jane		U		P	
Ann	U/P	U		P	
Tom		U		P	
Sue					N
Pam	U/N	U		P	
Ruth	U/N	U/F	U/F	P	U/N

assumptions from those offered by the CVT involving an interplay between other appraisals and emotions.

The CVT suggests that all appraisal combinations between control and value appraisals elicit anger/frustration and were apparent in the study. Pam and Ruth experienced them as a consequence of uncertainty and negative intrinsic motivation and Ann as a result of uncertainty and positive intrinsic motivation.

Anxiety was experienced by all but Sue and Pam. For Jane, Ann, and Tom, the inherent uncertainty appraisal was, unlike the CVT assumption, enough to elicit anxiety. For Ruth, and in line with the CVT, expectations of failure were also a factor that resulted in her hopelessness.

Motivational quality of instructions

All the students but Sue experienced enjoyment. Enjoyment was the product solely of experienced positive intrinsic motivation, thus differing from the CVT, which states that certainty also plays a role. Sue and Ruth experienced boredom, and the no-value appraisal stipulated by the CVT was not a factor. Instead, negative intrinsic motivation constituted the value appraisal. While the uncertainty appraisal stipulated by the CVT came into play for Ruth, it did not for Sue.

Feedback loops and reciprocal causation

Ann, Pam, and Ruth's interplay between the experienced appraisals and the negative achievement emotions was complex, involving feedback loops and reciprocal causation, as stipulated in the CVT (Pekrun, 2006, p. 320) and shown in Fig. 1. Through feedback loops, anger/frustration enforced the prospective uncertainty toward the achievement goal. In Ann's case, it did not result in any prospective outcome emotions, though, while, for Pam and Ruth, it elicited anxiety. For Ruth, failure expectations contributed to her anxiety, and the same appraisals resulted in her hopelessness. Hopelessness contributed, in turn, to the negative intrinsic appraisal leading to boredom, which affected her negative intrinsic motivation and thus showed reciprocal causation between appraisal and emotion.

What experiences do the students have of support from instruction librarians in relation to the experienced qualities of information-seeking skills task instructions and how can the support be designed to promote these experiences?

Instruction librarians can play a crucial role in promoting students' perceived cognitive and motivational qualities of instructions. The vast body of literature, not least evidenced by the development of research-informed standards and guidelines from library organizations (ACRL, 2015; Bent & Stubbings, 2011; EBSS, 2011), stressed their pivotal role as support for higher education students' achievement of information-seeking skills and other information literacies. Such support was also explicitly and implicitly expressed by the students in the study as being of significance for increasing their perceived cognitive qualities regarding the task instructions.

Promoting cognitive quality of task instructions

All the students but Jane, directly and indirectly, expressed that information-seeking skills support earlier during training, as well as with the actual task, would have prepared them better for and increased their experienced cognitive quality of task instructions. The need for such support suggests that instruction librarians could have been more involved in enhancing students' experiences of mastering instructions and thereby their cognitive quality.

For the students to experience the information-seeking skills support as beneficial for their ability to master the instructions, it needs to be subject and course specific and aligned with the goals, instructions, and other support, such as lectures and supervision. From an information behavior perspective (e.g., Limberg et al., 2012; Lindberg & Lundh, 2009; Lloyd, 2017), these context-dependent learning and information environments are conceptualized as information practices and, when

related to learning, are underpinned and explained by theories like Vygotskij and Kozulin's (1986) social constructivism and Wenger's (1998) communities of practice. The information practices are unique and need to be understood to provide relevant and sufficient support.

Some of these information practices concern instruction librarians and others teaching and supporting the students. Teachers' expertise in the subject is, according to Pekrun and Perry (2014, pp. 128–129), necessary to understand and support students' experiences of context-dependent achievement emotions and processes, suggesting that instruction librarians also require such discipline-specific competence. Ruth's experience of increased control after being helped by a librarian teaching in the educational sciences indicates the importance of such expertise.

A prerequisite for designing and integrating relevant context-specific support is instruction librarians' collaboration with teaching staff. A vast body of literature has described successful cooperation and its necessity (e.g., Junisbai et al., 2016; Lindstrom & Shonrock, 2006; Reed et al., 2022), including in teacher education (e.g., Bhavnagri & Bielat, 2005; Floyd et al., 2008; Kovalik et al., 2010; Purcell & Barrell, 2014).

Promoting motivational quality of task instructions

Unless involved in the formulation and creation of instructions, motivational quality is not related to support from instruction librarians in the literature, and this was also the case in the study. However, instruction librarians have the potential to contribute to and facilitate students' motivation by offering relevant and high-quality support.

Independence in the achievement process is assumed by the CVT (Pekrun, 2006, p. 320) to increase students' experienced motivational quality of instructions. In the study, all but Sue appreciated the autonomy of the task, enabling the exploration of topics reflecting their own interests. More precisely, the possibility to self-regulate is assumed by the CVT to be motivating. Self-regulation means that students are metacognitively aware of their thoughts, emotions, and actions in the learning process and can thereby regulate these in ways that are beneficial for achievement (Zimmerman, 2001, p. 5). Therefore, designing tasks and instructions, such as the independent exam thesis in the study and ones that promote self-regulating processes, is essential for increasing their experienced motivational quality.

Limitations and future research

Being a qualitative study, the findings provide only a partial glimpse of reality. However, future research employing quantitative methodologies with larger sample size encompassing a broader range of students and educational contexts, can build upon the findings to obtain more generalizable insights. It can also provide qualitative studies, conducted in, and transferred to similar higher education settings, with valuable insights.

Additional future exploration can identify other elements of the achievement context, such as course and program design, support from supervisors and peer students, and other learning activities, and consider how these interplay with cognitive appraisals and information-seeking achievement emotions. Moreover, students' self- and emotion-regulating learning strategies and how these relate to appraisals, achievement emotions, and context can be identified.

Another interesting topic for further inquiry would be to identify other types of affective phenomena—mood, attitudes, affective styles, and temperament (Davidson et al., 2003)—and establish how these behaviors relate to cognitive appraisals, achievement emotions, and context.

Conclusion

The present study offers a contribution to address the identified (Krakowska, 2020; Lopatovska & Arapakis, 2011; Savolainen, 2015b) lack of literature on emotions in library and information science,

including information behavior and information literacy research. Specifically, it sheds light on the emotions experienced by teacher students, an area that, likewise, has received limited attention (Dahlqvist, 2021a, 2021b). By expanding upon the existing body of knowledge, this study offers valuable insights and understanding to the field.

Moreover, the study contributes to the knowledge regarding the crucial role of emotions within formal educational settings. It particularly focuses on gaining an in-depth qualitative understanding of the appraisals and emotions experienced by primary teacher students as they develop their information-seeking skills. Recognizing the significant influence that they have as future educators responsible for nurturing young learners during their formative years, it is imperative to understand how primary teacher students learn.

Besides informing academic instruction librarians' professional practices, the study has theoretical and methodological implications for information behavior research exploring emotions. By incorporating the theories of semantic space of emotions and control-value theory of achievement emotions from cognitive and educational psychology, the study provides valuable analytical tools for understanding the emotional aspects of information seeking, especially within higher education achievement settings. Moreover, the application of the Geneva affect label coder for identifying appraisals and emotions presents a promising methodological approach to defining, mapping, and categorizing emotions and appraisals.

Declaration of competing interest

None.

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