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Authors

Michiel Voet: http://www.tecolab.ugent.be/michiel.php

Bram De Wever: http://www.tecolab.ugent.be/bram.php

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Michiel Voet and Bram De Wever

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History teachers' knowledge of inquiry methods: An analysis of cognitive processes used during a historical inquiry

ABSTRACT

The present study explores secondary school history teachers' knowledge of inquiry methods. In order to do so, a process model, outlining 5 core cognitive processes of inquiry in the history class room, was developed based on a review of the literature. This process model was then used to analyze think-aloud protocols of 20 teachers' reasoning during an inquiry task. It was found that less than half of the teachers used all cognitive processes during the inquiry. Based on the results, a distinction can be made between an integral, fragmentary and cursory approach to inquiry. Further analysis suggest that there exists no clear pattern in the relation between teachers' beliefs about the subject of history and their approach to inquiry. The implications for teacher training are discussed, and outline how the process model could serve as an instructional tool that can contribute to a comprehensive training program for history teachers.

1. INTRODUCTION

History, the study of the past, derives its name from the ancient Greek 'historia', meaning "inquiry, research, or result thereof" (Joseph & Janda, 2004, p. 163). This etymological base indicates that history is something one does: a reasoning process involving the use of research questions, hypotheses, evidence, and arguments (Monte-Sano, 2011). In keeping with this conception of history, inquiry-based learning has gradually moved center stage in research on school history (e.g. Monte-Sano, 2011; Reisman, 2012), driven by a combination of social, pedagogical, and academic developments (Wilschut, 2010).

Traditionally, school history often served the purpose of nationalistic education. During the past decades, however, rapid technological progress and globalization have caused a shift in its focus toward the preparation of democratic citizens, who are able to critically analyze information and form their own opinion (Laville, 2004). Acting as a catalyst for this change, the cognitive revolution has criticized traditional, textbook-driven history teaching for failing to engage students in higher-order thinking and being unable to foster understanding of the subject's underlying principles (Stearns, 2000). At the same time, emerging postmodernist views on historiography have also pointed out that history is not simply about learning what happened, as the available evidence can generally be used to construct multiple, sometimes contradictory but equally legitimate, accounts of the past (Wilson & Wineburg, 1993).

In history, inquiry-based learning, also referred to as *historical inquiry*, aims to deepen students' understanding of the subject, by letting them conduct their own investigations into the past. The available evidence suggests that this approach is indeed effective for developing students' historical reasoning skills, but that it may also help to prepare students for solving information problems outside of school (see e.g. Reisman, 2012; Wiley & Voss, 1996). It is important to point out, however, that the overarching goal is not a full attainment of historical research skills, but rather the development of an understanding of how historical knowledge is constructed and evaluated (Lee & Ashby, 2000). As historical reasoning is, in essence, a thought process that hinges on the use and framing of evidence (Monte-Sano, 2010), historical inquiry logically centers on the analysis of information, and its use as evidence to form arguments in support of particular conclusions.

As a result of the move toward historical inquiry, history teachers' practice is becoming increasingly permeated by the standards and debates from the world of historians. Teachers are now expected to introduce students to history's interpretative nature, as well as to transform subject matter into lessons and materials that allow students to engage in the process of knowledge construction in history (Monte-Sano & Budano, 2013). Several studies have consequently looked into how teacher training can prepare teachers for this task (e.g. Bain, 2006; Levy, Thomas, Drago, & Rex, 2013; Martin & Monte-Sano, 2008). An important shortcoming of this work, however, is that it has so far paid relatively little attention to teachers' actual knowledge of how historical inquiries are conducted.

2. HISTORY TEACHERS' KNOWLEDGE OF INQUIRY METHODS

Research has indicated that teachers' beliefs about the subject, together with their subject knowledge, play an important role in their decisions about instruction (Cess-Newsome & Lederman, 1999). This is not different within the context of history education (Barton & Levstik, 2003).

Most of the previous work has focused on teachers' beliefs about history, and in particular on their ideas about the nature of knowledge, and classroom inquiry (e.g. Maggioni, VanSledright, & Reddy, 2009; McDiarmid, 1994; Voet & De Wever, 2016; Yilmaz, 2010). Teachers' beliefs about the nature of knowledge seem to vary between (1) objectivist views emphasizing an objective analysis of evidence, (2) subjectivist views that regard history as merely an opinion, and (3) criterialist views stressing that the result of an inquiry is an interpretation that must nevertheless be grounded in evidence (e.g. Maggioni, VanSledright, & Reddy, 2009). Teachers also appear to hold different conceptions of classroom inquiry, with some (1) reducing it to processing information and the application of reading comprehension skills, some (2) equaling it to a critical evaluation of the reliability of information, and others

(3) emphasizing full investigations that center around a problem statement (Voet & De Wever, 2016). According to earlier research, teachers' training can play an important role in the development of these beliefs (Levy et al., 2013; Martin & Monte-Sano, 2008).

Compared to history teachers' beliefs about the subject, their knowledge of inquiry methods is a largely unexplored terrain. This is largely because the power that teachers' beliefs hold over their instructional decisions, appears to outweigh that of their knowledge. It turns out that even teachers with a deep understanding of how historical knowledge is constructed, may choose not share this knowledge with their students, because doing so runs counter to their beliefs about school history (Barton & Levstik, 2003; McDiarmid, 1994). Even so, others have argued that history teachers should have a basic understanding of inquiry methods, if they are to support their students during classroom inquiries (Martin & Monte-Sano, 2008; Yilmaz, 2010). Unfortunately, there is not much information available about the extent to which teachers know how to conduct a historical inquiry. In addition, it is also unclear how this knowledge is related to teachers' beliefs about the subject.

Most of the existing research builds on the work by Wineburg (1991a), who employed think-aloud protocols to compare academic historians' and high school students' reasoning with several information sources on the Battle of Lexington (1775), one of the first military engagements during the American Revolutionary War. The finding that students generally did not know how to handle a historical inquiry, led Wineburg (1991b) to the hypothesis that some of their teachers' may also have limited knowledge of historical inquiry.

Using the same design in a study with 15 secondary school teachers, Yeager and Davis (1996) were able to confirm this supposition, and reported three distinct approaches toward an inquiry: (1) history as a construction of meaning, the most historian-like approach, involved a review of source information, comparison of different accounts, and a search for sub-text and missing information, while (2) history as entertainment reflected a narrow understanding of inquiry as a process of information gathering that was mainly determined by readability and interest. In between lay (3) history as a search for accuracy, representing cases in which an account was solely judged by its preciseness and the extent to which it was corroborated by others, without taking other criteria into account.

A case study by Bohan and Davis (1998), in which three student history teachers examined several explanations for the dropping of the atomic bomb during World War II provided further evidence that not all history teachers are familiar with historical inquiry. Even though each of these students had previously completed coursework that introduced them to history, it was found that they did not take an analytical approach to sources, nor did they consider evidence contrary to their own opinion.

Unfortunately, these studies only provide a general overview of history teachers' knowledge of inquiry methods. It is not clear exactly which of the cognitive processes involved in an inquiry are the most challenging to teachers, or how teachers' use of these cognitive processes is related to their beliefs about the subject. The present study therefore aims to provide a more comprehensive overview of history teachers' knowledge of inquiry, through an analysis based on a process model for inquiry in the history classroom.

3. A PROCESS MODEL FOR INQUIRY IN THE HISTORY CLASSROOM

Inquiry-based learning consists of a sequence of learning activities through which learners attempt to answer questions by exploring and analyzing data (Levy et al., 2013). Finding that inquiries are often complex undertakings (Hmelo-Silver, Duncan, & Chinn, 2007), research, particularly in the field of science learning, has made considerable efforts to reduce complexity by dividing the inquiry process into smaller and logically connected stages, phases or activities that draw attention to specific aspects of scientific reasoning (see e.g. the reviews of Bell, Urhahne, Schanze, & Ploetzner, 2010; Pedaste et al., 2015).

Previous research has indicated that the main activities of an inquiry are in part dependent on the subject (Bransford, Brown, & Cocking, 2000). Even though there is some common ground between inquiries across subjects, history calls upon a distinct form of classroom inquiry, because, as Levy et al. (2013) explain: "Like the scientist, the historical investigator must consider various approaches to a problem, but unlike the scientist, the historian cannot reenact the topic under investigation" (p. 394). Thus, while inquiries in science learning often revolve around model development, through adjusting variables in experiments or simulations (Bell et al., 2010), historical inquiries are primarily concerned with constructing interpretative accounts from incomplete, partial, or even contradictory information sources (van Drie & van Boxtel, 2008).

A process model for inquiries in the history classroom was developed based on a review of studies on reasoning during a historical inquiry, which were published during the past 25 years. The studies that were selected (1) focused on reasoning specifically in history, and (2) did not use the same framework as research that had preceded it. Even though there exist different approaches to historical research, the available research suggests that it is possible to distinguish a number of key processes. Before moving on to an overview of these processes, it is important to point out that, as the model focusses on cognitive processes, it pays less attention to content-related aspects, such as teachers' use of historical terminology and meta-concepts, like causation, change over time, or empathy (for more information, see van Drie & van Boxtel, 2008). It should also be noted that the processes outlined in the model are in turn influenced by the resources that are available for an inquiry task. These variables are not

considered by the model, but have been documented elsewhere, and mainly include: beliefs about knowledge and knowing in history (Lee & Ashby, 2000), knowledge of the topic under investigation (Wineburg, 1998), experience with methods of historical inquiry (Wineburg, 1998), metacognitive abilities (Poitras & Lajoie, 2013), as well as the available information and nature of the sources (Rouet, Britt, Mason, & Perfetti, 1996).

The process model for historical inquiry integrates the cognitive processes uncovered by previous research into five core cognitive processes. Using the original terminology and descriptions used by these studies, Table 1 shows how the findings of this relatively large body of work fit within the five core processes. Moreover, it indicates that, so far, knowledge of the processes involved has been fragmented across different research reports, with some even using the same terms to describe different activities (e.g. the way contextualization is described across different studies). In line with previous descriptions of historical reasoning as a specific form of reasoning that "requires general reasoning skills, but also contains several characteristics that are more specific to this particular domain (van Drie & van Boxtel, 2008, p. 104)", some of the core processes can be considered as characteristic of history, while others might appear as more domain-general. Although the model's presentation may suggest a linear sequence, learners can go through processes in the order that is needed, and return to them at any time.

Sourcing. Depending on the questions that are asked, information sources may be incomplete, partial or even contradictory. A first core process, sourcing, therefore centers on determining the nature of a source, by looking at its appearance and origin, to get a better sense of what might be expected in terms of reliability and content. This results in a set of assumptions about what might reasonably be expected from a source. Wineburg (1991a) originally described this process as finding out more about (1) author characteristics and (2) time and place of creation, and others (e.g. Hicks, Doolittle, & Ewing, 2004) later added (3) the type of source as another aspect to consider.

Appraising. Looking more closely at a source's content, appraising is a second core process that involves a more thorough assessment of the bias and reliability of a source. Assumptions about a source are thus verified or rejected based on the message it conveys. This requires a critical analysis of (1) point of view and intentions of the author (e.g. Wineburg, 1994), (2) coherence of the message, and possible existence of errors (De La Paz & Felton, 2010), (3) evidence given in support of a claim (De La Paz & Felton, 2010), and (4) similarities and inconsistencies across sources, as wel as possible explanations for the latter's existence (e.g. Wineburg, 1991a).

Specifying. As a third core process that directs the search for information, specifying represents an active, focussed approach to information that strives to optimize

understanding. More specifically, this involves (1) question-asking, either as a way to delineate the objective of the search (e.g. van Drie & van Boxtel, 2008) or as a way to handle missing information (e.g. Perfetti, Britt, Rouet, Georgi, & Mason, 1994), and (2) activating prior knowledge, for example by drawing on existing knowledge of the topic or making analogies with other time periods (Wineburg, 1998).

Constructing. A fundamental aspect of inquiries in history, represented by a fourth core process named constructing, consists of going beyond the information provided by sources to build a mental model of the past (Perfetti et al., 1994). This is done by (1) selecting and interpreting information that is relevant to the problem statement (van Drie & van Boxtel, 2008), and (2) contexualizing the information, by building a frame of reference containing the chronological, social, and spatial context of the events (e.g. Wineburg, 1998).

Arguing. A fifth core process, arguing, is concerned with reporting the conclusions of an inquiry. Although there is always some degree of uncertainty surrounding claims about the past, their plausibility is heavily determined by the extent to which they are based on sound arguments. In other words, this requires (1) supporting an explanation by formulating arguments based on quotes, general citations or references (Poitras & Lajoie, 2013), and (2) taking possible counterarguments into account (van Drie & van Boxtel, 2008).

4. AIMS OF THE RESEARCH

So far, studies have only provided a general overview of teachers' knowledge of inquiry methods (e.g. Bohan & Davis, 1998; Yeager & Davis, 1996). Further investigation, based on the process model that is outlined above, could make a significant contribution to the current understanding of history teachers' subject knowledge, but also inform the design of teacher training. In the present study, history teachers' knowledge of inquiry methods is explored through an analysis of their performance during an inquiry task. The main research questions (RQ) are:

- RQ 1: To what extent do teachers engage in the core cognitive processes of historical inquiry?
- RQ 2: Which approaches can be identified based on teachers' performance during the task?
  - RQ 2A: What are the exact differences between these approaches to inquiry?
  - RQ 2B: How are teachers' approaches to inquiry related to their beliefs about the subject?

Table 1

Cognitive processes used during a historical inquiry

	Wineburg (1991a) *Heuristics historians use during problem-solving*	Perfetti et al. (1994) *Interpretative skills involved in reading history*	Wineburg (1994) *Cognitive representation of historical texts*
Sourcing	**Sourcing**: Looking first at the source or attribution of the source (e.g. Who is the author? What are the place and date of the source's creation?).		**Document as event:** Understanding the nature of a source, and particularly the circumstances under which it came into being.
Appraising	**Corroboration**: Comparing important details across sources before accepting them as plausible or likely.	**Detecting author bias:** Assessing the author's point of view, by looking at selectively omitted events, attempts at persuading the reader, or the use of slanted or colorful language. **Handling inconsistencies among texts:** Recognizing and reconciling details that are reported differently across sources.	**Representation of subtext – rhetorical artifact**: Reconstructing the purposes and intentions behind the document. **Representation of subtext – human artifact**: Identifying the author's biases, convictions, and assumptions about the world.
Specifying		**Detecting the incompleteness of texts**: Dealing with uncertainty by asking for more information on basic details and facts, historical context, and controversial information.	
Constructing	**Contextualization**: Placing events in a chronological sequence and concrete spaces, and trying to determine the conditions of their occurrence.		**Representation of event - Outside**: Considering a source's description of perceptible aspects of an event (e.g. layout of the land, configuration of buildings). **Representation of event - Inside** Inferring the 'invisible' aspects of events described by a source (e.g. intentions, motives, beliefs). **Event model**: Combining individual representations of events into a cumulative mental model.
Arguing		**Resolving conflicting views:** Negotiating contradictory views in order to form a personal opinion.	

Table 1, continued

Cognitive processes used during a historical inquiry

	Wineburg (1998) *Historians' problem-solving in face of missing background knowledge*	Hicks, Doolittle and Ewing (2004) *SCIM-C strategy*
Sourcing		**Summarizing**: Examining the documentary aspects of a source (e.g. Who is the author? What type of source is it?) **Contextualizing:** Locating the source within time and space (e.g. When was the source produced? Why was the source produced?)
Appraising	**Social-rhetorical comments:** Fleshing out the author's perspective and purpose. **Intertextual linkages**: Referring back to documents read previously while processing information.	**Corroborating:** Comparing information across sources (e.g. What are differences and similarities? How can these be explained?)
Specifying	**Specification of ignorance**: Addressing partial understanding by expressing puzzlement, asking questions or specifying gaps in knowledge. **Analogical comments**: Explaining events or behavior by drawing comparisons to other historical periods. **Historiographic comments**: Making connections to what historical writing has found out about the event.	
Constructing	**Linguistic comments**: Reflecting on the historical meaning of words, terms and phrases. **Biographic comments:** Reconstructing individuals' life, personal thinking and behavior. **Spatio-temporal comments**: Situating events in a physical location, and within a chronological sequence.	**Monitoring**: Reflecting on understanding and progress (e.g. What additional evidence is needed? Which ideas need further defining?).
Arguing		**Inferring**: Examining the source in light of the historical question being asked (e.g. What is suggested by the source? What interpretations may be drawn from the source?)

Table 1, continued

Cognitive processes used during a historical inquiry

	van Drie and van Boxtel (2008) *Framework of historical reasoning*	De La Paz and Felton (2010) *Historical reasoning strategy*	Poitras and Lajoie (2013) *Cognitive and metacognitive activities in historical inquiry*
Sourcing	**Use of sources – evaluation:** Evaluating the source in light of the historical question (e.g. trustworthiness, context, point of view).	**Consider the author:** Examining the author characteristics and the source's date of creation.	**Evaluating the trustworthiness of sources:** Looking at the author or type of document to learn whether it provides a reliable account of the event.
Appraising			**Corroborating evidence:** Making connections between similar and different information.
Specifying	**Asking questions:** Asking descriptive, causal, comparative or evaluative questions that guide the construction of a historical narrative.	**Understand the sources:** Reflecting on the source's perspective, by looking at the values and assumptions underlying the arguments. **Look within each source**: Determining the trustworthiness of information, by checking for factual errors or missing information, and considering the available evidence. **Look across the sources:** Comparing sources to find the main ideas that are repeated, but also major differences in ideas, and possible inconsistencies.	**Question-asking:** Asking about a singular or composite explanation.
Constructing	**Contextualization**: Interpreting the phenomenon in accordance with the chronological, spatial and social context. **Use of sources - selection:** Selecting and interpreting information from sources to answer a historical question.		**Formulating an explanation:** Providing a provisional account of the events under study. **Contextualizing evidence:** Elaborating on the details that surround the event
Arguing	**Argumentation:** Putting forward a claim after weighing different interpretations, supporting it with arguments and evidence, and taking counterarguments into account.	**Create a more focused understanding**: Using the available evidence to decide what is most plausible and what remains open to interpretation.	**Gathering evidence:** Formulating an argument for or against an explanation through a direct quote, general citation, or specific reference.

5. DESIGN AND METHOD

This section provides more information about the context of the study, participants' background, and the approach that was used to examine teachers' knowledge of historical inquiry. In addition, it offers an overview of the analyses that were conducted, with specific attention to the issue of reliability.

5.1. Context

The present study was part of a larger research project in Flanders (Belgium) on history teachers' familiarity with disciplinary frameworks, which also explored participating teachers' beliefs about the nature of history and inquiry-based learning (see also, Voet & De Wever, 2016). In Flanders, attainment targets for school history stress the development of a basic understanding of disciplinary methods, and regard classroom inquiries as fundamental to reaching this goal. However, in practice, teachers are mostly able to design their own lessons as they see fit. As there are no central exams, but only a quadrennial evaluation of (parts of) a school's program by government inspectors, there is a lot of freedom with regard to curriculum development (for more information on Flemish history education, also see, De Wever, Vandepitte, & Jadoulle, 2011). It is also important to know that, in Flanders, secondary education is based on educational tracking, which groups students, depending on their ability, into four study tracks that contain different curricula (i.e. general, technical, art or vocational education). This system of educational tracking is, however, heavily debated, as studies have indicated that it is detrimental for equality of opportunity for schooling, and instead promotes social segregation between schools (Hindriks, Verschelde, Rayp, & Schoors, 2010).

5.2. Participants

Invitations to take part in the study were sent out to 127 schools in the region of East-Flanders, and were further distributed across schools in other regions by two pedagogical counselors. Only teachers who had at least three years of experience in teaching history were invited to respond, so that all of the participants had had a number of opportunities to further develop their subject knowledge through their work in the classroom. A second restriction was that only teachers in grade 4 of secondary education (average student age: 15-16 years) could participate. The reason was that inquiry methods tend to become more prominent in the curriculum from the second half of secondary education onward, and that picking a specific grade would allow to select teachers with more similar backgrounds. The call further explained that teachers would be asked to perform a task related to history, but did not contain any details, to avoid dissuading certain teachers from participating. Registration was closed when

more than 20 teachers had replied, after 12 days, and teachers could no longer register for the study from then on.

On average, teachers were 43 years old (SD: 12 years) and had about 15 years of experience (SD: 9 years) in teaching history to secondary school students. Five teachers held a bachelor degree of a three-year teacher training at university college, with a mainly practical focus on learning to teach history and two other subjects in the lower and middle grades of secondary education (grade 1-4). Fourteen teachers had obtained a master degree of a four-year history program at university, which had introduced them to academic history. Finally, one teacher held a master degree of a four-year university program in political sciences, and had thus not received specific training in history. All fifteen university graduates had later followed a one-year teacher training program, which certified them to teach their subject in the middle and higher grades of secondary education (grade 3-6).

Depending on the schools they worked in, these teachers instructed history in different study tracks: 10 worked in general education tracks, mainly consisting of theoretical courses, 6 worked in technical education tracks, offering more technical and practical courses, and 4 worked part-time in both of these study tracks.

5.3. Task

Similar to earlier research (e.g. Wineburg, 1991a; Yeager & Davis, 1996), an inquiry task was designed to elicit and capture teachers' historical reasoning. In keeping with the central role of the use and framing of evidence in historical inquiry, the task required teachers to analyze historical information to evaluate a problem statement about an event in English medieval history: the Peasants' Revolt of 1381. At that time, a combination of restrictive labor laws and oppressive taxes drove a large part of England to rise against central and local authority. The name of the revolt has been much discussed by historians, as some members of urban communities and higher classes also participated in the uprising (e.g. Dobson, 1970; Dyer, 1994). In line with this larger academic debate, the task's instructions presented the following problem statement: 'Do you think the name of Peasants' Revolt is appropriate for the uprisings of 1381?' This problem was first of all selected because solving it required the participants to find and weigh answers to several questions (e.g. What are 'peasants'? Who were the first instigators? How did the revolt spread? What manner of people participated? What was each group's motive for doing so?). A second reason for choosing this specific problem was that it allowed to partly control the cognitive resources that teachers had available for this task. Flemish history textbooks rarely mention the Peasants' Revolt, and even if they do, only mention it very briefly. As such, it was assumed that all teachers would start

the task with little prior knowledge of the events that were under investigation (a hypothesis that was not contradicted by the comments teachers made during the task).

5.4. Materials

Teachers received four documents on the Peasants' Revolt of 1381, and were not allowed to look up additional information. This allowed to further control the resources that teachers had available, but also means that teachers' general information search strategies (e.g. formulating key words, selecting sources) were not investigated by the present study. In order to provide an authentic task, the task materials included a variety of information sources that historians could also encounter while conducting a search on the topic. Furthermore, all of the information sources provided different, and sometimes even opposing, views on the problem statement. The result was a challenging task that required teachers to construct a coherent account from different pieces of information, and thus elicited the use of the core cognitive processes that were outlined by the process model presented above. The final selection included fragments from: the English Wikipedia article on the Peasants' Revolt, a contemporary chronicle by Benedictine monk Thomas Walsingham, and two historical monographs. The first monograph was written by Richard Dobson (1970), an Emeritus professor at Cambridge University, and the second one by Christopher Dyer (1994), an Emeritus Professor at the University of Leicester. All four texts were shortened to fit on one page and translated into Dutch. A header was added to each document, providing more information about the author and date of production. The complete task, including all sources, can be found within appendix 1.

5.5. Data collection

Each teacher worked on the task during an individual session, which had no time limit, but generally lasted up to approximately one hour. At the start of each session, teachers were assured that the data regarding their performance would not be used as part of any professional evaluation, and would be kept confidential. Teachers' reasoning was captured using think-aloud protocols: they were asked to say out loud whatever thought came to their mind during their work on the inquiry task. According to previous work on the study of reasoning, think-aloud protocols outperform retrospective methods by offering more insights in decision-making processes (Kuusela & Paul, 2000) and are preferable over other concurrent methods, as there are no interruptions, questions or suggestive prompts (Van Someren, Barnard, & Sandberg, 1994). Moreover, thinking aloud becomes routine after a few minutes, and is therefore assumed not to interfere with task performance (Ericsson & Simon, 1993). When teachers had been silent for a considerable time, they were generally prompted with:

'What are you thinking?' or 'What are you doing?' During the task, teachers were allowed to mark passages and make notes on the documents. They did not have to write out their conclusions in full, and were invited to present them verbally instead.

5.6. Pilot study

A pilot study was conducted with three other teachers, in order to evaluate the design of the task. The experiences from this pilot study helped to optimize the task and instructions. For instance, it was found that teachers often forgot to articulate their thoughts when they were allowed to read the documents in silence. In contrast, reading out loud appeared to trigger teachers to automatically verbalize their thoughts. The main study therefore required teachers to read all texts out loud.

5.7. Analysis

Teachers' think-aloud protocols were captured using a digital voice recorder, and subsequently transcribed. All transcripts were coded with Nvivo 10, using a content analysis approach (Neuendorf, 2002). The process model for inquiries in the history classroom was adapted into a coding scheme, which is presented in Table 2. Next to the codes, this table presents a short description of each core process and the underlying cognitive activities, as well as examples retrieved from the think-aloud protocol of teacher 4. Using the coding scheme, all transcripts were segmented into thematic units, consisting of phrases, sentences or paragraphs that conveyed one particular thought. An excerpt of a coded think-aloud protocol can be found in appendix 3. After completing the analysis, frequencies of codes were calculated for each individual teacher, but also across all teachers. Teachers' individual results were then transformed into radar charts, as visualizations of qualitative data is often able to facilitate their interpretation (Miles & Huberman, 1994).

5.8. Reliability

The final analysis scheme counted 15 different codes, of which 13 corresponded to the 5 core cognitive processes and 2 were used to map general (meta-)cognitive behavior (e.g. recapitulating the problem statement, checking progress) and off-task behavior (e.g. talking about classroom practices, social comments). The latter two were included in the analysis of inter-coder reliability, but not in the main analyses, which focused on teachers' use of the core cognitive processes. Using the coding scheme, the first author coded all 20 think-aloud protocols. A second coder was then instructed in the use of the coding scheme, and coded 5 think-aloud protocols as part of a training session during which she received feedback on her

Table 2

Overview of the coding scheme

Cognitive processes and corresponding codes	Example
Sourcing - determining the nature of a source	
SO1 Looking at the author's background and credentials.	This one is also a professor, yes.
SO2 Looking at the period of the source's production.	1411. There are 30 years between the events and the author's death.
SO3 Looking at the type of the source.	Why the English version of Wikipedia? Does it present an English perspective?
Appraising - assessing the contents of a source	
AP1 Evaluating the author's perspective	He is obviously biased against the peasants.
AP2 Evaluating the author's reasoning	Laborers asked for freedom… Then those people were really serfs.
AP3 Evaluating the evidence	This is based on law enforcement records, made by the government.
AP4 Corroborating information	The previous text mentioned taxation, and taxes are also present here.
Specifying - actively processing information	
SP1 Asking questions and identifying missing information	What is Wat Tyler [rebel leader]? Is it a name, is it a place.
SP2 Activating prior knowledge	Military operations in France. That's probably the Hundred Years' War.
Constructing - building a mental model of the past	
CO1 Retrieving information about the problem	Most rebels were peasants or craftsmen. So they were affluent peasants.
CO2 Situating events in their context	The revolt had an economical basis, with taxes and labor shortage.
Arguing - using evidence to support a claim	
AR1 Presenting arguments in support	It's not a good name, as only a part of the peasants rose up in revolt.
AR2 Rebutting counterarguments	Although it was a problem of the rural community, it is not a good name, because others joined later on.

Note. Examples were retrieved from the transcript of teacher 4.

coding. Afterwards, the second coder independently coded the remaining 15 think-aloud protocols (i.e. 75% of the data). The two sets of independent coding for these 15 think-aloud protocols were used to calculate segmentation agreement (for more information, see Strijbos & De Laat, 2006) and coding reliability. The 'irr' package in R.3.1. was used to conduct the reliability analysis. The results indicate that proportion agreement for segmentation was 89.1%, which is well above the 80% threshold advocated by Riffe, Lacy and Fico (1998). With regards to coding reliability, a value of .79 for Cohen's Kappa indicated excellent agreement beyond chance (Banerjee, Capozzoli, McSweeney, & Sinha, 1999). Differences in coding were discussed afterwards, with each of the coders explaining his or her interpretation, until final agreement was reached.

5.9. Additional data

After completing the inquiry task, all teachers, save for teacher 19, took part in a semi-structured interview on their beliefs about the subject. This interview study, of which the main findings have been reported elsewhere (see Voet & De Wever, 2016) explored teachers' beliefs about (1) the nature of history, as well as (2) inquiry in the classroom. Beliefs about the nature of history were investigated using questions drawn from academic debate within history, such as: "Is there a difference between a historical theory and an opinion?". On the other hand, beliefs about inquiry in class were examined by probing teachers ideas' about the role of disciplinary thinking in school history, including: "Are there similarities between school history and historical research?" In order to decrease the chance of a social desirability bias occurring, the interviewer explicitly stated that he was interested in teachers' personal opinion, and that, as such, there were no right or wrong answers. The assurance that all data would be kept confidential also helped to reassure teachers that they did not need to be afraid to share their ideas.

After transcription, the interviews were analyzed through a process of open coding, which divided the data into units of meaning, corresponding to a single theme. This analysis resulted in a number of sub-categories for beliefs about the nature of history and inquiry (e.g. beliefs about the nature of history covered sub-categories like: nature of knowledge, research methods and procedures, and criteria for evaluating knowledge). The contents of these sub-codes were then used to create two data matrices (see Miles & Huberman, 1994) that contained a summary of the findings for each participant. Based on the contents of these matrices, each teacher case was assigned a profile that positioned it on two axes, which are described in Table 3: one included three types of epistemological beliefs, whereas the other contained three types of instructional beliefs that surfaced during data analysis.

To check for inter-rater reliability, each of the transcripts was reviewed by a second researcher, who independently attributed a profile to each teacher case. Percent agreement with the original analysis was 81.82% (18 out of 22 cases) for beliefs about the nature of history, and 90.91% (20 out of 22 cases) for beliefs about inquiry. In both cases, the results thus exceed the threshold of 80% that was proposed by Riffe et al. (1998). In cases were the analyses disagreed, both researchers presented their arguments and discussed the case until agreement was reached.

Table 3

History teachers' beliefs about their subject

Beliefs about the nature of history *based on Maggioni, VanSledright and Reddy (2009)*		Beliefs about classroom inquiry	
Type	Description	Type	Description
Criterialist	Personal choice and judgment play an important role in conducting historical research and forming conclusions, but clear criteria exist to judge the plausibility of accounts.	*Investigating*	Inquiry is about solving problems, by generating questions, analyzing information and forming arguments.
Objectivist	Interpretation does or should not play a role in history, other than filling up gaps between sources. History is akin to a quest for the truth about the past.	*Evaluating*	The goal of inquiry is learning how to critically evaluate information, in order to determine which information is correct.
Subjectivist	Historical accounts should be based on evidence, but it is not possible to say which explanation is more plausible, as this is ultimately a matter of opinion.	*Understanding*	Inquiry activities are reduced to processing and comprehending information that further explains the lesson topic.

Note. This table was adapted from the study by Voet and De Wever (2016)

6. RESULTS

In this section, the results related to the two research questions are discussed separately. The first subsection presents an overview of the cognitive processes that teachers used during the inquiry task, as well as the extent to which individual teachers used them. In the second

subsection, these results are used to construct a typology of teachers' approach to historical inquiry, which is then related to their beliefs about the subject.

6.1. History teachers' use of cognitive processes during an inquiry

After all transcripts had been coded, means were calculated for the number of times each of the codes surfaced in the think-aloud protocols of the complete group of teachers. Table 4 presents the results, and suggests that some cognitive processes took a more prominent place in teachers' thinking compared to others.

Table 4

Means and proportions of codes in teachers' think aloud protocols

Cognitive process		M (SD)	%
Sourcing		**7.5 (4.07)**	**17.81**
SO1	Looking at the author's background and credentials.	2.75 (1.86)	6.53
SO2	Looking at the period in which the source was produced.	1.8 (1.4)	4.28
SO3	Looking at the type of the source.	2.95 (2.37)	7.01
Appraising		**11.6 (8.04)**	**27.55**
AP1	Evaluating the author's perspective.	2.05 (1.93)	4.87
AP2	Evaluating the author's reasoning.	1.95 (2.06)	4.63
AP3	Evaluating the evidence.	3.8 (3.93)	9.03
AP4	Corroborating information.	3.8 (3.19)	9.03
Specifying		**7.6 (8.29)**	**18.05**
SP1	Asking questions and identifying missing information.	4.15 (5.88)	9.86
SP2	Activating prior knowledge.	3.45 (3.24)	8.19
Constructing		**11.3 (7.93)**	**26.84**
CO1	Retrieving information about the problem.	8.10 (5.37)	19.24
CO2	Situating events in their context.	3.20 (3.66)	7.6
Arguing		**4.1 (3.42)**	**9.74**
AR1	Presenting arguments in support.	2.1 (2.86)	4.99
AR2	Rebutting counterarguments.	2 (1.59)	4.34

In what follows, each of the five cognitive processes is further described within the context of the task, using quotes drawn from the think-aloud protocols.

Sourcing. When teachers tried to get a better sense of a source, the author's characteristics were a first aspect they looked at. For instance, upon reading that a source 4 was written by a professor at the universities of York and Cambridge, teacher 3 noted that:

'This is a work by a leading authority, is what I am thinking now'. A second aspect that teachers paid attention to when sourcing, was the time when a source was produced. Before reading source 3, teacher 9 compared its date to that of source 4 and stated: "This is a work that was written in 1994, so it is more recent. I do not mean to say that historical works from the 1970's are bad, but it is possible that new material has surfaced, which sheds a new light on the past." Finally, teachers also looked at the type of the source. As she started with source 1, teacher 18 said: "I see Wikipedia over there, which makes me a little bit suspicious, and I start thinking I will get a heap of information that does not necessarily have to be correct. But I will read it anyway."

Appraising. When evaluating a source, a first criterion that teachers took into account was the author's point of view, but mainly when this was stated explicitly. For instance, after teacher 16 had read source 2's description of the rebels as "the originators and first causers of these evils", he remarked that: "There is a strong bias in the second source, although it does give a good idea of how the clergy, or at least a part of it, regarded the revolt." Second, teachers evaluated the line of reasoning presented by each account, and either voiced agreement with the author's conclusions, or remarked upon some seemingly faulty line of reasoning. When teacher 7 read source 4's conclusion that most rebels were peasants and craftsmen, when hitherto, the text had only described the rebels' property in terms of its monetary value, he was momentarily confused: "What? How can you… How do you reach this conclusion? This one is hard to follow." Third, teachers investigated the evidence that authors presented, including the references presented by secondary sources. In this way, teacher 10 discovered that: "Richard Dobson [author of source 4], he refers to Walsingham [author of source 2], among others, but probably to provide a description. Let us see where he uses this. […] Ah yes, he uses Walsingham to write about the important role that poor priests played in spreading discontent." Finally, teachers tried to corroborate information and to explain inconsistencies that they encountered when doing so. For instance, at some point, teacher 2 related that: "I just read something about some [of the peasants] asking for their freedom [in source 1]. […] But here [source 3], they talk about a large group of peasants, or persons, rebels, who held their own lands. But if they owned their lands, they must have been free, I think. So, this does not really match… But this [source 1] is more general, while this [source 3] is more… A more focused study, I think, yes."

Specifying. To direct their search for information, teachers first of all engaged in question-asking. Some teachers, such as teacher 5, formulated several global research questions: "So, central question. Did the peasants join the revolt and was there concerted action? Possible explanations? Aimed against whom? Course? Results? The classics, really." In addition, teachers kept their eyes out for missing information, which prompted additional question-

asking. For example, when teacher 6 read that the revolt was the best-documented uprising to occur during the middle ages, he made note to: "Investigate why so much information was kept. Who did that?" Second, teachers called upon their prior knowledge to help them with interpreting the sources' content. Among these cases is that of teacher 18, who explained that a number of analogies could be made with other historical events: "It somewhat makes me think of it as a precursor of the French Revolution [in 1789]. You could also link it to what happened here during the Battle of the Golden Spurs [in 1302]. In general, it think it is one of the waves that started near the end of the middle ages, where you see the people becoming more conscious about having an own identity."

Constructing. In their attempt to construct a mental model of events, teachers were particularly observant of information related to the problem statement. More specifically, teachers appeared to build a model of the information that was available in each separate source, and often held out on drawing their own conclusions until they had processed all of the information. For example, after teacher 13 read source 1, she summarized that: "The rebels were a diverse group, consisting of different social classes, with each having their own goal", while after reading source 2, she concluded that: "According to this source, it was actually a revolt of peasants. […] Yes, because the rebels were mainly peasants and laborers." Although the teacher remarked that these claims were contradictory, she did not consider weighing them against one another until she was in the process of forming her own conclusions. Second, teachers also used the information in sources to situate the events of the revolt within a historical context. In one such example, teacher 20 spent a considerable amount of time reconstructing the start of the revolt, because she could not figure out how labor legislations could possibly have provided an undercurrent for the revolt: "[The labor laws were instated around] the 1350's. But I don't see how that was another reason for the revolt. So that would have lasted until 1381? That seems like, yes… I would not really…"

Arguing. As part of formulating their conclusions, the teachers presented arguments in support, and attempted to rebut counterarguments. Overall, counter-arguments were rebutted in two ways. Teachers sometimes refuted counterarguments by arguing that they were based on faulty reasoning, but the commonly used approach was to reframe these counterarguments, by adding information or adopting a different perspective. Among the examples is that provided by teacher 5, who argued that "It started as a peasants' revolt, but it ultimately became more than just that", and then started to defend his claim by explaining that: "If you look at the ones revolting, then it is logical that peasants are the largest group, because there were a lot of them on the countryside. [But] it then spread from the countryside to the cities. First London, and then to… […] It escalated, it seems to me, and other groups also joined."
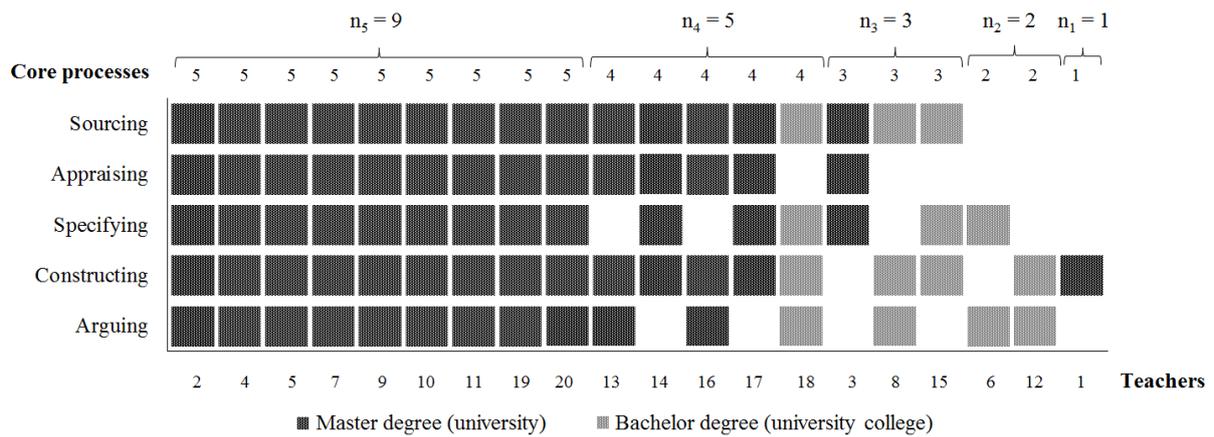
Figure 1. Teachers' use of core cognitive processes.

The analysis also explored the extent to which individual teachers used the five core cognitive processes during the inquiry task. Use of a cognitive process was operationalized as a minimum of activity at the very least. As such, it was decided that teachers had not used a cognitive process if: (1) the count of two or more codes (see table 3) belonging to the same cognitive process was 0 (meaning that two or more of these underlying cognitive activities were absent in the think-aloud protocol), or (2) the count was 0 for one code, and not higher than 2 for the other codes belonging to the same process (meaning that the latter were also scarcely present in the think-aloud protocol). One exception to this rule was the core process of 'arguing', where use of the cognitive process was defined as having considered and rebutted at least one counterargument. Figure 1 presents an overview of the results.

As the figure indicates, 9 teachers (n_5) used all five cognitive processes during the inquiry task. The other 11 teachers (n_4 to n_1) did not use one or more of these cognitive processes. The results indicate that teachers' initial training might be able to explain some of these differences, as each of the 9 teachers who used all cognitive processes had obtained a master degree at university. However, teachers' initial training does not appear to be the sole factor related to teachers' use of the core cognitive processes during the inquiry task, since another 6 teachers with a similar degree did not use all of them. The analysis also considered teachers' age and teaching experience, but these did not appear to be related to their performance.

Looking at the 11 cases of teachers who did not use all cognitive processes, the processes that were most often overlooked by teachers are: specifying (n=5), arguing (n=5), and appraising (n=6). It thus seems that seems that some teachers are less familiar with these cognitive processes than those of constructing (n=2) and sourcing (n=3). The results also suggest a further divide between a first group of 8 teachers (n_4 and n_3) who still tried to assess

sources through either sourcing or appraising, and a second group of 3 teachers (n_2 and n_1), who read through all of the sources without doing so.

6.2. A typology of history teachers' approach to inquiry

Based on the results shown in figure 1, a distinction can be made between three distinct approaches to inquiry: an integral, fragmentary and cursory approach. These approaches indicate that differences between teachers were not simply a matter or more or less historical thinking in general, but rather of which cognitive processes they did or did not use during an inquiry.

Three illustrative teacher cases (teacher 4, 3 and 12) were selected to illustrate how each approach might manifest itself during an inquiry task. The main purpose of these examples is to explain the typifying characteristics of each of the three approaches to inquiry, but there are, of course, differences in the exact ways that teachers within the same category completed the inquiry task (see figure 1). This is especially the case for fragmentary or cursory approaches, where the use of certain cognitive processes differed across teachers.
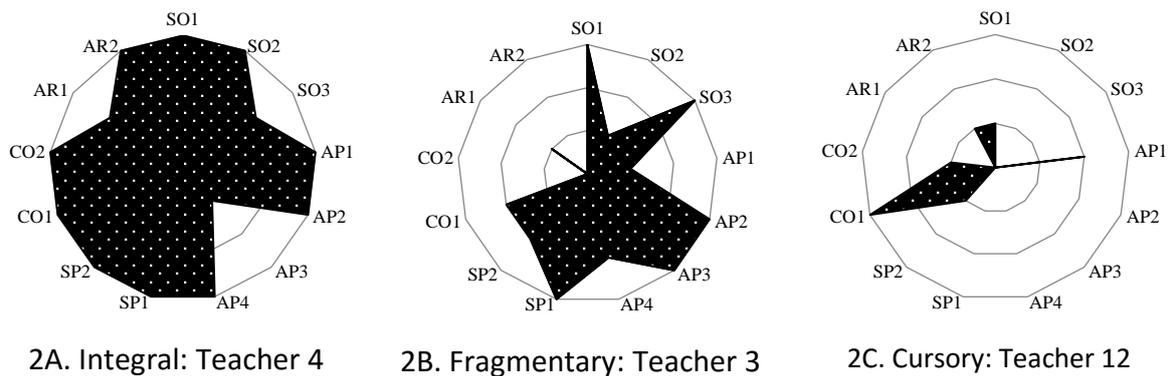

2A. Integral: Teacher 4   2B. Fragmentary: Teacher 3   2C. Cursory: Teacher 12

Figure 2. Three distinct approaches to inquiry (see table 3 for the legend
of the codes of the cognitive processes depicted in the radar charts).

Figure 2 provides more information on these three teachers' performance, with radar charts illustrating the number of times (i.e. 1, 2 or > 2) each code was counted (for an overview of all teachers' radar charts, see Appendix 2). Most importantly, these cases illustrate that, compared to an integral approach, a fragmentary or cursory approach drew less on a critical analysis of information sources, or did not provide a conclusion that incorporated both arguments and counterarguments.

Integral approach. Teachers with an integral approach used each of the five core cognitive processes. As a consequence, radar charts of these teachers' performance, such as the one presented in Figure 2A, approach the shape of a circle.

The way in which teacher 4 carried out the task implies that he had a good understanding of what a historical inquiry involves. Before he started reading, this teacher took a quick look at each source, and summarized: "[Source 1] Wikipedia. Internet encyclopedia. Yes, we know that. Also anonymous, so with question marks hanging over it. Yes. [Source 2] Chronicler. Ah, this one is a contemporary. [Source 3] University. [Source 4] And this is also a professor, yes." After getting a sense of each source, teacher 4 began reading source 1, and did so in an analytical manner. First of all, he asked questions and tried to activate his prior knowledge: "What is Wat Tyler [rebel leader] Is it a name, a place? I don't know yet, but I do want to know." He also constructed a mental image of the way events were depicted in the source, and (later) critically compared this to other sources: "So here [source 1] they are mainly speaking of laborers. [...] And those are probably farmers and serfs. Maybe that part is not correctly translated, but I don't know that. Because I don't know their social status. But laborers can refer to all kinds of people. Source 3 suggests, based on judicial records, that they are mainly tenants. But mainly the middle… [class]". Teacher 4 kept using this analytical approach as he read through the other sources, and ultimately gave an elaborate conclusion, which counted a number of arguments and counterarguments, and integrated information from different sources: The main idea of his conclusion was that: "The main problem… The core of the problem is the shortage of laborers and the friction between the nobility, manorial lords, and their serfs and free peasants. But I also think that there is a general malaise in society, which makes them revolt. I draw this conclusion mainly from what the people from London do. That is to say, they support the revolt."

To conclude, the case of teacher 4 shows how an integral approach manifests itself as an analytical approach to information, which takes different perspectives into account. However, even when using all cognitive processes, it was still possible for teachers to make factual errors. For example, teacher 19 confused King Richard II with Richard I, and then surmised that the taxes preceding the revolt had been used to finance the third crusade, which thus made him situate the events in a historical context that had actually preceded them by 200 years.

Fragmentary approach. Teachers with a fragmentary approach to inquiry did not use all cognitive processes, but nevertheless tried to determine the value of each source through sourcing, appraising, or both. As Figure 2B demonstrates, radar charts corresponding with this teacher type generally show a leaf-shaped form.

As teacher 3 was reading through the sources, it became clear that he was very focused on evaluating each source. In particular, he was very critical of the reasoning and evidence presented in a text, regardless of its author's status. For example, as teacher 3 read the conclusion of source 1, he disagreed and noted that: "the fact that support is given by a

number of people that are not peasants does not mean that it cannot be called a Peasants' Revolt." Similarly, he later criticized the reasoning in source 3: "[upon reading that the gentry scarcely took part in the revolt] I am thinking about this claim, because that… They seem to assume, or know this. That is what I am asking myself right now. […] They are saying that rebels from the group of country squires were scarce, but where, where is the evidence?" On the other hand, however, this teacher seldom summarized information from the documents, and did not make comments indicating that he was trying to situate the events in a historical context. In the end, teacher 3 reviewed his evaluation of each source, and concluded that: "I am inclined to agree with source 4, and therefore to say that 'Peasants' Revolt' is an incorrect name for the English revolt of 1381, because the study of professor Dobson indicates that, apart from peasants, craftsmen, priests and the gentry were also involved in the revolt." He did not take information from other sources into account, nor did he consider possible counterarguments.

Although he did not use a number of the core cognitive processes, the case of teacher 3 indicates that teachers with a fragmentary understanding nevertheless understand that a critical evaluation of source information makes up an important part of a historical inquiry. However, the fact that they overlooked a number of cognitive processes generally resulted in a less complete analysis of information or an account that lacked further substantiation

Cursory approach. Teachers showing a cursory approach appeared to have little familiarity with historical inquiry, and did not use most of the core processes, including sourcing and appraising. Therefore, these teachers' radar charts, of which Figure 2C is an example, are mostly blank.

As teacher 12 started reading the sources, it quickly became evident that she read through all of the information without critically analyzing it. Most of her thinking seemed to focus on the retrieval of information for solving the problem. This resulted in comments like: "This has little to do with peasants, although, maybe it does." or "Wait, I forgot something. The laborers asked for higher wages and less work. That may yet be useful." When teacher 12 presented her conclusion, she did not refer to information within the sources, but instead stated that: "The peasants took the lead in the revolt, or others got them as far as to start a revolt, if I may say it that way. They were manipulated. They were, without actually realizing it, doing the dirty work for others." This conclusion was remarkable, as none of the information sources suggested that as much had happened. Unfortunately, teacher 12 did not further substantiate her claim, so it was unclear how she had actually reached this conclusion.

In short, the case of teacher 12 illustrates how teachers with a cursory approach appear to have little familiarity with a historical inquiry. These teachers did not engage in an analytical

approach to the text, and seemed to give a general impression instead of a well-founded conclusion.

The last part of the analysis explores the relation of teachers' approach to inquiry with their beliefs about the subject. The results of this analysis are presented in figure 4, which positions teachers on two axes, corresponding with their beliefs about the nature of history, and beliefs about inquiry in the classroom (see table 2 for more information about these beliefs).
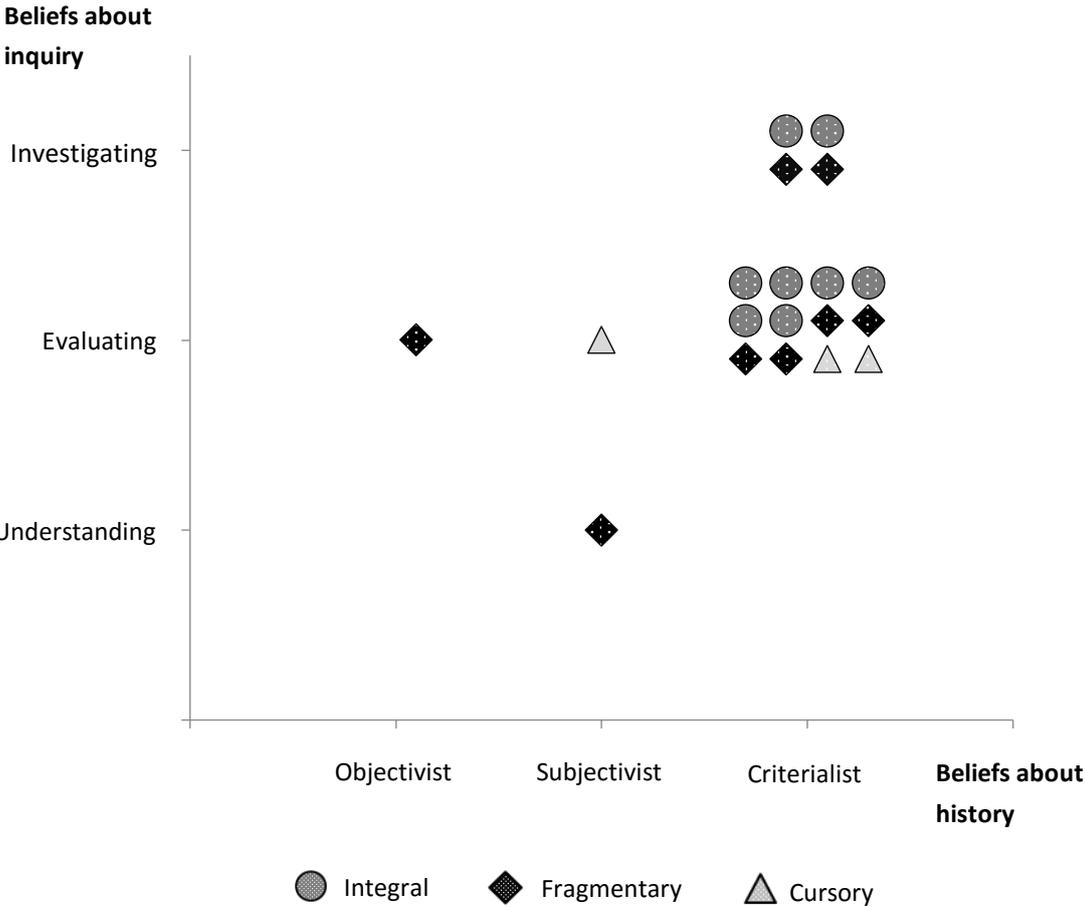

Figure 3. Teachers' approach to inquiry related to their beliefs about the subject.

A closer look at the graph does not immediately show a clear pattern across teacher cases. Yet, some issues are noteworthy. First of all, teachers with an integral approach only appeared within the 'criterialist' category of beliefs about history, stressing that the result of inquiry is an interpretation that should be carefully grounded in evidence. However, among these criterialist teachers, there were also some with a fragmentary or cursory approach to inquiry. Second, part of the teachers with an integral approach appeared to see classroom inquiry mainly as 'evaluating' the trustworthiness of a source, despite their own familiarity with

inquiry methods. On the other hand, the graph also suggests that some of the teachers with a fragmentary approach actually did consider elaborate inquiries, focused on 'investigating' information sources to answer a problem statement about the past. It is furthermore interesting that teachers with a cursory approach did not turn up in the latter category of beliefs about classroom inquiry.

7. DISCUSSION

In order to investigate history teachers' knowledge of inquiry, a process model was developed for inquiry in the history classroom. Although earlier research had already described these processes, knowledge of them was found to be fragmented across different research reports (see the overview in table 1). The present study contributes to the theory on inquiry in the history classroom by constructing a frame that integrates the findings from previous work. This work revealed five *core cognitive processes*: sourcing, appraising, specifying, constructing, and arguing.

The finding that less than half of the teachers within the sample used each of these cognitive processes during an inquiry task provides additional evidence for the claim that not all history teachers may be competent in historical inquiry (Bohan & Davis, 1998; Yeager & Davis, 1996). Three distinct approaches were identified, which indicate that differences in teachers' performance during an inquiry are not simply a matter of more or less historical thinking in general, but rather of the cognitive processes that they do or do not use. An *integral approach* corresponds to use of all five core processes, suggesting a strong knowledge of historical inquiry. A *fragmentary approach* indicates that, although teachers did not use all cognitive processes, they still paid specific attention to assessing the content or value of sources through sourcing or appraising. Finally, a *cursory approach* refers to cases where most cognitive processes, including sourcing and appraising, were not used, and teachers read through the documents without adopting an analytical stance. This typology resembles that of Yeager and Davis (1996), although the more detailed analysis of the present study now offers a number of clear criteria for making a distinction between teachers. Furthermore, the results also show that a fragmentary approach to inquiry can take different forms, depending on the cognitive processes that are overlooked. This finding therefore nuances the previous study's description of such an approach as a preoccupation with sources' accuracy.

Next to this, the results suggest that part of the differences in teachers' performance might be related to their training prior to the start of their career (McDiarmid, 1994; Yilmaz, 2010). More specifically, it was found that all 9 teachers with an integral approach held a master degree of a training program that had introduced them to academic history (with the exception of teacher 19, who had followed a political sciences program). However, next to 5

teachers holding a bachelor degree of a more practically oriented teacher training, 6 other teachers with a master degree did not use all cognitive processes during the task. This finding suggests that other factors are also at play here. Assuming that teachers holding the same degree started their career with a similar knowledge base, it would be interesting to know why some teachers' knowledge of inquiry seemingly faded as they started teaching history.

Furthermore, the finding that there was no clear pattern in the relation between teachers' beliefs about the subject and their approach to inquiry, seems to suggest that beliefs about history exist relatively separate from one's knowledge of inquiry methods. Although the lack of such a pattern should be interpreted with caution because of the small sample size, it does echo earlier findings that even teachers with an elaborate knowledge of inquiry methods sometimes choose not to teach their students about those methods (Barton & Levstik, 2003)

Finally, there remain a number of limitations to the present study. First of all, the present study mainly investigated counts to determine whether teachers had or had not used a cognitive process. Although the criteria for this decision were not arbitrary, they are not absolute either, as there is some room for discussion as to what actually constitutes 'use' of one of the core cognitive processes. Future research could further investigate this issue, by for example looking into other measures of engagement in the core cognitive processes of historical inquiry.

Second, the use of the process model for historical inquiry resulted in a focus on the extent to which a number of core cognitive processes were used during the inquiry, rather than content-related aspects, such as factual accuracy, or the use of certain terminology or meta-concepts. The finding that teachers who used all cognitive processes could still make factual errors is not necessarily a cause for concern, however, as earlier research (e.g. Wineburg, 1998) already indicated that it is not abnormal for confusion or errors to occur during an inquiry, nor are these automatically disastrous to its outcomes. On the other hand, future research investigating the use of historical terms and meta-concepts during an inquiry could provide a valuable addition to the process model, as previous work suggests that teachers' understandin²g of this domain-specific vocabulary in part determines whether and exactly how they engage in each of the core cognitive processes (van Drie & van Boxtel, 2008).

Related to this, a third limitation is that the present study mainly focusses on teachers' use and framing of evidence, given its central role in history and historical inquiry (Monte-Sano, 2010). Processes that precede this task, such as the formulation of a problem statement, or the search for information, were not investigated. Future research that looks further into this matter could therefore complement the process model outlined by the present study.

A fourth limitation is that the present study used a single task to measure teachers' knowledge of historical inquiry. Although the emergence of the core cognitive processes

across findings from different studies makes it seem likely that teachers would use the same approach throughout different inquiry tasks, the question still remains whether different task sets might elicit different reasoning patterns in the same participant, or yield consistent results.

A fifth limitation, which is characteristic to think-aloud protocols, is that teachers who did not use certain cognitive processes, may still have known about them. Research has shown that the same abstract knowledge can have both declarative and procedural embodiments (Anderson, 1993). In other words, some teachers may be able to give a factual description of inquiry methods, while they are unable to execute these in practice. Future research could investigate whether this is indeed the case by comparing think-aloud protocols to other measures, such as knowledge tests or classroom observations.

Finally, it may also be possible that closing the study's registrations after the required number of teachers had responded introduced a sampling bias. It is not unthinkable that the first replies came from highly motivated teachers, who might have been more familiar with inquiry methods, even though the results do not indicate this was the case.

Despite these limitations, the present study contributes to the literature a process model of inquiry for the history classroom and typology of teachers' approach to inquiry, which can provide a starting point for future research.

8. IMPLICATIONS AND FUTURE RESEARCH

Finding that knowledge about historical inquiry has been fragmented across different research reports, the present study offers a process model of historical inquiry that integrates the findings of previous work into five core cognitive processes. This model may help to overcome the confusion caused by the existence of multiple frameworks emphasizing different aspects of historical reasoning, and gives both educators and researchers a clear overview of cognitive processes that are fundamental to historical inquiry. An important limitation of the model, however, is that, given its focus on cognitive processes, it pays less attention to content-related aspects. Further investigations of teachers' use of historical terms and meta-concepts could therefore offer a valuable addition to the model, as this may reveal further differences in teachers' reasoning, or help to explain why some do not engage in certain core cognitive processes.

Equally important, however, are the implications that the findings hold for research on the training of history teachers. The finding that more than half of the teachers did not use all five core cognitive processes during an inquiry, indicates that a significant number of teachers may not have strong knowledge of historical inquiry. This gives rise to some concern, as researchers have made the case that understanding historical inquiry is fundamental for

being able to teach it to students (Martin & Monte-Sano, 2008). Even though curriculum materials may go a long way in supporting teachers to organize inquiries (Davis & Krajcik, 2005), it can be argued that teachers still need sufficient knowledge of inquiry to be able to adopt a reflective approach toward the use of these materials. The main question thus appears to be how teacher training can further develop teacher candidates' knowledge of inquiry in the history classroom.

The finding that all teachers demonstrating an integral approach to the historical inquiry had followed a four-year program on academic history, is in line with earlier research suggesting that courses introducing teachers to history's disciplinary frameworks may contribute toward the development of their knowledge on inquiry in the classroom (Bain & Mirel, 2006; Martin & Monte-Sano, 2008). In this light, the process model presented in this study offers an instructional tool that can contribute to a comprehensive training program. An approach that has student teachers use the process model to investigate think-aloud protocols of student work during inquiries, or their own observations during inquiries in the classroom, could significantly increase their understanding of classroom inquiries. More specifically, this could help student teachers to (1) become more familiar with the core cognitive processes involved in a historical inquiry, (2) make a more systematic assessment of thinking during inquiries, and (3) get a better sense of students' thinking during inquiry, as well as the errors common to their work.

Finally, the finding that teachers' beliefs about the subject seem to exist relatively separate from their knowledge of inquiry, suggests that teacher training programs should aim to cover both of these topics, as growth in one area does not necessarily seem to run parallel with that in the other.

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10. APPENDIX 1: INQUIRY TASK

10.1. Task description

Is the 'Peasants' Revolt' an appropriate name for the English uprisings of 1381?

In 1381, England was witness to a great and violent revolt, which has traditionally been described as the 'Peasants' Revolt'. There is, however, a lot of discussion about this name for the revolt. You have access to four (fragments) of information sources that provide more information on the revolt. Use these sources to form your own conclusion: Do you think the name of 'Peasants' Revolt' is appropriate for the uprisings of 1381? It is important that you also explain on what basis you draw this conclusion. You can use the space below to make notes.

10.2. Source 1. Wikipedia (English version), *The Peasants' Revolt*

About the source: Wikipedia is an online encyclopedia, which is maintained by people all over the world. Everyone can contribute to Wikipedia, even anonymously.

The Peasants' Revolt, Tyler's Rebellion, or the Great Rising of <u>1381</u> was one of a number of <u>popular revolts in late medieval Europe</u>. Tyler's Rebellion was not only the most extreme and widespread insurrection in English history but also the best-documented popular rebellion ever to have occurred during medieval times.

The Poll Tax. The revolt was precipitated by heavy-handed attempts to enforce the third <u>poll tax</u>, first levied in 1377 supposedly to finance military campaigns overseas [1]. The third <u>poll tax</u> was not levied at a flat rate (as in 1377) nor according to schedule (as in 1379); instead it allowed some of the poor to pay a reduced rate, while others who were equally poor had to pay the full tax, prompting calls of injustice. The tax was to be paid by every man and woman older than 15 years [2].

Labour shortage. The <u>Black Death</u> that ravaged England in 1348 to 1350 had greatly reduced the labour force, as a large part of the population had died [3]. As a consequence, the surviving labourers could demand higher wages and fewer hours of work, and some even asked for their freedom. They often got what they asked for: the lords of the manors were desperate for people to farm their land and tend their animals. Then, in 1351, King Edward III summoned parliament to pass the <u>Statute of Labourers</u>. The statute attempted to curb the demands for better terms of employment by pegging wages to pre-plague levels and restricting the mobility of labour. Compliance with the new law was strictly observed; labourers or lords who failed to observe it were punished [4]. The enforcement of the new law angered the peasants greatly and formed another reason for the revolt.

Rebels. Despite its name, participation in the Peasants' Revolt was not confined to serfs or even to the lower classes. The most well-known leader, Wat Tyler, was, in fact, not a peasant. Other leaders include Jack Straw, John Wrawe, and John Ball. John Wrawe "led the peasants of Essex," and John Ball was a priest who had been imprisoned for a few years before the revolt. The peasants also received help from members of the noble classes - one example being William Tonge, a substantial alderman [clarification is needed], who opened the London city gate through which the masses streamed on the night of June 12 [5]. However, this is debatable; the actions of individuals like Tonge could be ascribed to fear and panic rather than rational persuasion by the rebels. It is possible that people, like Tyler, had other complaints and issues with the government or "local officials," so they took this opportunity to rebel and make their demands known [6].

[1] A continuation of the Hundred Years' War initiated by King Edward III of England.
[2] J. Dean (1996). Literature of Richard II's Reign and the Peasants' Revolt.
[3] J. Dean (1996). Literature of Richard II's Reign and the Peasants' Revolt.
[4] D. Jones (2009). "The Peasants' Revolt." History Today 59.6, 33-39.
[5] Dobson 220
[6] J. Dean (1996). Literature of Richard II's Reign and the Peasants' Revolt.

10.3. Source 2. Thomas Walsingham, *Historia Anglicana I*

About the source: Thomas Walsingham was a monk who died around 1422. Like all chroniclers, Walsingham was mainly a collector of stories, and not a historian as we now know them.

For the rustics, whom we call 'nativi' or 'bondsmen', together with other country-dwellers living in Essex sought to better themselves by force and hoped to subject all things to their own stupidity. Crowds of them assembled and began to clamor for liberty, planning to become the equals of their lords and no longer to be bound by servitude to any master. In order to put their desires into effect, men from those two villages which were the originators and first causers of these evils sent messages to every village however small. No man was excused and all, both old and vigorous, were to assemble with weapons as they could; all men who failed, neglected or scorned to come knew that their goods would be scattered, their homes burnt or destroyed and their heads cut from their necks. In a short time so large a body was forced to assemble that it could be reckoned at five thousand of the most mean and common rustics. Among a thousand of these men, it was difficult to find one who was properly armed; but, because they formed so large a number, they believed the whole kingdom would be unable to resist them.

To gain greater support, they sent messengers to Kent to inform the people there of their plans, inviting them to meet them in order to acquire their liberty, concert further action and

change the evil customs for and of the kingdom. Therefore the Kentishmen, hearing of things most of them already desired, without delay assembled a large band of commons and rustics in the same manner as the men of Essex. Soon they blocked all the pilgrimage routes to Canterbury, stopped all pilgrims of whatever condition and forced them to swear that they would come and join the rebels whenever they were sent for, and that they would induce their fellow citizens or villagers to join them; and that they would neither acquiesce nor consent to any tax levied in the kingdom henceforth except only for the fifteenths which their fathers and ancestors had known and accepted. Soon afterwards the news of these deeds passed rapidly through the counties of Sussex, Hertford, Cambridge, Suffolk and Norfolk; and all the people expected great happenings.

And so the mob came to the place called 'le Blakhet', and after the king had declined to meet with them, the common people were furious and immediately took the road to London. The mayor and aldermen of London, fearing for the city, ordered the gates to be closed immediately; but the common people of the city and especially the poor favoured the rustics and stopped the mayor from closing the gates by using force and threatening to kill him if he tried to do so. And so the rascals enjoyed free access to and exit from the city. On the next day the rebels went in and out of London and talked with the simple commons of the city about the acquiring of liberty; and in a short time easily persuaded all the poorer citizens to support them in their conspiracy.

10.4. Source 3. *Christopher* Dyer (1994), *Everyday life in medieval England*

About the source: Christopher Dyer is Emeritus Professor of Regional and Local History, and director of the Centre for English Local History at the University of Leicester.

This study is based on the mass of manorial records, which are now more readily available. Such is their bulk that it has been necessary to concentrate on the four countries of Essex, Hertfordshire, Kent and Suffolk. The method of research has been to compile an index of non-urban places affected by the revolt, and then to look for manorial records of those places or at least for manors in their vicinity. By combing manorial and government records for the names of known rebels, it is possible to find out more about their background. This has been done for eighty-nine rebels, forty-eight from Essex, eighteen from Hertfordshire, thirteen from Suffolk and ten from Kent.

We know something about their material possessions from the escheators' valuations of the goods and lands of indicted individuals, and the records of the royal courts sometimes give the rebels' occupations. This evidence shows that about half of the rebels from the whole area of rebellion owned goods valued at £1 to £5, and 15 of them were worth more than £5, including the very affluent Thomas Sampson of Suffolk and John Coveshurste from Kent. This

is sufficient to show that we are dealing primarily with people well below the rank of the gentry, but who mainly held some land and goods, and not the poorest.

The economic standing of our rebels is best indicated by the size of their holdings, of which we are given some indication in thirty-six cases. Of these, fifteen had holdings of 14 acres or more, of whom only two held more than 32 acres; nine held between 7 and 12 acres; and 12 were smallholders with 5 acres or less. In some cases the information is incomplete, so the figures represent minimum landholdings. Nor should the other rebels be assumed to have been landless – the great majority can be shown from references to rent payment or their attendance at manorial courts to have been tenants.

In general, the sample seems to represent a wide spectrum of rural society, with a slight bias towards the better off. This could reflect the nature of the government sources, which tend to give the names of leaders rather than the rank and file, and the manorial records, which tell us more about tenants than servants. The gentry will not appear in the sample because manorial documents will refer to them rarely, but rebels from this group were few in any case. There is nothing here to contradict the traditional identification of the rising as the 'Peasants' Revolt'. Most of the rebels were peasants and craftsmen. En when we talk about the presence of craftsmen from villages and small towns among the rebels and their leaders, we are in fact talking about a part of rural society. These people were not allies to the peasants, but rather a part of them.

[1] The large manor of the abbey at St Albans in Hertford was not included in this study, because the large amount of documents within this collection requires a separate study.
[2] Hilton, Bond men made free, p. 180-4.

10.5. Source 4. Richard Dobson (1970), *The Peasants' Revolt of 1381*

About the source: Richard Dobson was Emeritus Professor of history at the universities of York and Cambridge.

In the first place the traditional description of the 1381 rising as a 'Peasants' Revolt is itself deceptive. In no part of England for which documentary evidence survives in quantity do peasants appear to have risen in complete isolation from members of other social classes. At Canterbury, Norwich, Yarmouth, Bury St Edmunds, Ipswich, St Albans, Winchester and Bridgwater as well as London the riots of the year were the product of an alliance, at times uneasy, between the townsmen and villagers from the surrounding regions. Although disorder in York, Beverly and Scarborough was precipitated by news of events in London, the issues at stake in these three towns were essentially self-generated and not all conditional on the intervention of the local peasantry.

The same general conclusion emerges from a study of the otherwise very different and much more explosive situation within London itself. The exact role played by the Londoners during 1381 remains as controversial an issue now as it was at the time; but their intervention was certainly important, and probably decisive. Without some London support, the peasants from Kent and Essex could never have enjoyed their brief moment of exhilarating and exhausting power. Nearly all the chroniclers agree that there was a good deal of sympathy for the peasants' cause among the lower classes within the city. Even the official city account of the revolt admits that the insurgents were assisted by London's 'perfidious commoners of their own condition'. Surviving but incomplete lists of the names of Londoners involved in acts of rebellion (154 in the Rolls of Parliament and 238 in the London Plea and Memoranda Rolls) point to a massive participation of Londoners in the revolt.

And even if we confine our attention to the rural elements within the rebellion it proves impossible to analyse the movement as one of exclusively peasant grievances. The prominent role played by 'poor priests' as sowers of discord and as rebel leaders is one of the best-known features of the revolt. John Wrawe and John Ball, to take the two most famous examples, were members of the large ecclesiastical proletariat of late medieval England, a class whose clerical status was too rarely rewarded by a sufficiently responsible religious function.

Even more remarkable are those instances in which members of the county gentry actively contributed towards the disorders of the year. It is just possible that the participation of knights like Sir Roger Bacon and Sir Thomas Cornuerd in the East Anglian risings testifies to the economic difficulties of the smaller English landlords at a time of acute labour shortage. According to this interpretation, the crisis of 1381 may have promoted (if only temporarily and in restricted areas of eastern England) a political alliance between the richer peasantry and lesser squirarchy. However, the great majority of English gentleman who took part in the rebellion did so for personal and usually discreditable reasons. The collapse of order in the summer of 1381 encouraged existing 'gentry gangs' to extend the range of their blackmailing and 'protection racket' activities.

[1] Rot. Parl., III, 96-7; York Memorandum Book, ed. M. Sellers (Surtees Society, 1912-15), II 69-70; Coram Rege Roll, Easter 9 Richard II [KB. 27/500], Rex, membs. 12, 12v; partly printed in Réville, pp. 253-6; Ancient Petitions [SC.8], no. 11205; printed by C. T. Flower, 'The Beverly Town Riots', Trans. Royal Hist. Soc., new series, XIX (1905) 94-5.

[2] London Letter Book H, fo. CXXXIII, by H. T. Riley, Memorials of London, pp. 449-51; cf. Calendar of London Letter BOOK H, p. 166.

[3] Walsingham, Historia Anglicana, II 1-4; cf. Chronicon Angliae, pp. 301-4; Coram Rege Roll, Easter 5 Richard II [KB. 27/484], Rexn memb. 26; partly printed in Réville, pp. 175-82; Chronicon Henrici Knighton, II 151, 170; Fasciculi Zizaniorum, Rolls Series, 1858, pp. 272-4.

11. APPENDIX 2: OVERVIEW OF TEACHER CASES

Teacher 2

Teacher 4

Teacher 5

Teacher 7

Teacher 9

Teacher 10

Teacher 11

Teacher 19

Teacher 20

Teacher 13

Teacher 14

Teacher 16

Teacher 17

Teacher 18

Teacher 3

Teacher 8

Teacher 15

Teacher 6

Teacher 12

Teacher 1

12. APPENDIX 3: CODED EXCERPT FROM THE THINK ALOUD PROTOCOLS

The following excerpt was randomly selected from the think aloud protocol of teacher 10, and details how he analyzed source 4 in the inquiry task (for more information on the codes, see table 3).

GC1	**Reporting general activity**	Okay, I am moving on to the fourth source.
AP3	**Evaluating the evidence**	Richard Dobson. And that is the source that was also used, or maybe not… By Wikipedia, ah yes. There is a reference to 5, Dobson, but not to his surname, or the year of… Dobson 220. So maybe that's the same Dobson as the one I am about to read.
GC3	**Reading the source**	Richard Dobson was Emeritus Professor of History at the universities of York and Cambridge. In the first place, the traditional description of the 1381 rising as a 'Peasants' Revolt' is itself deceptive. In no part of England for which documentary evidence survives in quantity do peasants appear to have risen in complete isolation from members of other social classes.
CO1	**Retrieving information about the problem**	I am underling peasants not rising in isolation from other social classes. Dobson also says that not all rebels were peasants.
GC3	**Reading the source**	At Canterbury, Norwich, and so on, the riots of the year were the product of an alliance, at times uneasy, between townsmen and villagers from the surrounding regions. Although disorder in York, Beverly,… was precipitated by news of the events in London, the problems there already existed and not at all conditional on the intervention of the local peasantry.
CO1	**Retrieving information about the problem**	I am underling that those unrests were not caused by the local peasant population.

GC3	**Reading the source**	The same conclusion emerges from a study of the situation within London itself. The exact role played by the Londoners remains as unclear now as it was at the time; but their intervention was certainly important and probably decisive. Without some London support the peasants from Kent and Essex could never have gained control. Nearly all the chroniclers agree that there was a good deal of sympathy for the peasants' cause among the lower classes within the city.
AP4	**Corroborating information**	I am now thinking that I have already read that information in the account by Walsingham.
GC3	**Reading the source**	Even the official city account of the revolt admits that the insurgents were assisted by London's 'perfidious commoners of their own condition'.
AP3	**Evaluating the evidence**	The footnote refers to a letter book, and it appears that he also uses the source by Walsingham, which I just read.
GC3	**Reading the source**	Surviving but incomplete lists of the names of Londoners involved in acts of rebellion, 154 in the rolls of Parliament and 238 in the London Plea and Memoranda scrolls, point to a massive participation by Londoners in the revolt.
AP3	**Evaluating the evidence**	Okay, so there are comprehensive lists available of the Londoners who were involved in the revolt.
GC3	**Reading the source**	And even if we confine our attention to the rural elements within the rebellion, it proves impossible to analyze the movement as one of exclusively peasant grievances. The prominent role played by poor priests is one of the best-known features of the revolt. John Wrawe and John Ball, to take the two most famous examples…

AP4	**Corroborating information**	That is what I just read in Wikipedia. So that will indeed be the part that… I am now looking in the text from Wikipedia to see where I encountered those names.
AP4	**Evaluating the evidence**	Five, which is indeed the footnote referring to Dobson. So that part of Wikipedia is probably based on the book of Dobson.
GC3	**Reading the source**	To take the two most famous examples, where members of the large ecclesiastical proletariat of the late medieval England, a class whose clerical status was too rarely rewarded by a sufficiently responsible religious function. More remarkable are those instances in which the lower nobility actively contributed towards the disorders of the year. It is just possible that the participation of knights like sir Roger Bacon and Sir Thomas Cornuerd in the East Anglian risings testifies to the economic difficulties of the smaller English landlords at a time of accurate labor shortage.
AP4	**Corroborating information**	That labor shortage is also mentioned in Wikipedia.
GC3	**Reading the source**	According to this interpretation, the crisis of 1381 may have promoted an alliance between the richer peasantry and the lower nobility, if only temporarily and only in restricted areas of eastern England. However, the great majority of English gentleman who took part in the revolt did so for personal and usually discreditable reasons.
SP1	**Asking questions and identifying missing information**	But what kind of discreditable reasons? The text does not mention this.
GC3	**Reading the source**	The collapse of order in the summer of 1381 encouraged existing gangs of the lower nobility to blackmail other people.
GC1	**Reporting general activity**	Okay, I have read all four sources.