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Review

# The process of historical questioning: a systematic literature review

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## Abstract

The majority of history educators in the English- and German-speaking contexts concur that the objective of history education is to foster historical thinking. While there exist some models for the progression of second-order concepts that provide an analytical framework to support these learning processes, such models are almost entirely lacking for the procedural aspects of historical thinking. This is also true for historical questioning, which is generally regarded in the literature as the 'engine' of historical thinking. However, there remains a paucity of theories and empirical studies that systematically operationalise the process of historical questioning and its development. To address this research gap, our systematic literature review provides in-depth insight into relevant studies on (historical) questioning from different angles in order to conceptualise three main operations of historical questioning: (1) experiencing perplexity, (2) explicating perplexity and (3) expressing the historical question. Furthermore, the review systematises sub-operations and quality characteristics of both the process of historical questioning

and its operations. Finally, the results are discussed based on an analytical framework and with regard to practical implications.

**Keywords** historical questioning; historical learning; questioning processes; quality characteristics; historical thinking; history education; literature review

## Introduction

Questions play an important role in historiography in order to develop hypotheses or to define and refine historical discourses (Droysen, 1868; Kraus and Kohtz, 2011). Although it is controversial to what extent concepts in history education should be based on the approach of professional historians (Lee and Chapman, 2015; Zanzanian, 2024), there is broad consensus that questions are important for historical learning (Bracke et al., 2018; Brauch, 2016; Chapman et al., 2024; Ciardiello, 2007; Dehne, 1997; Klewitz, 1997; Körber et al., 2007; Kühberger, 2016; van Boxtel and van Drie, 2018; VanSledright, 2014). It is therefore hardly surprising that questions are also part of school curricula in both English-speaking and German-speaking countries (Common Core State Standards Initiative, 2010; MSB NRW, 2020). Nevertheless, previous studies have shown that historical questions are rarely intentionally addressed in the classroom (Chapman et al., 2024; Hauschke, 2012; Mehr, 2013). Moreover, textbook tasks do not necessarily encourage the learning of historical questioning (Bharath and Bertram, 2018; Katzier, 2023; Thünemann, 2010). However, historical questions can support reading strategies during historical inquiry (Nokes and Kesler-Lund, 2019) and are part of the cognitive process of historical writing (Schneider and Zakai, 2016). In addition, it seems that older high school students are more conscious of the constructivist nature of history during questioning (Fina, 1975). Nonetheless, it is not clear to what extent intentional instruction of historical questioning can lead to a long-term and nuanced understanding of history (Behrendt and Brauch, 2018, 2020). This may also be due to the fact that it is still unclear how historical questioning can be learned, as studies on the operationalisation (Logtenberg, 2012) or development of this construct are rare (Schobinger et al., 2023). One could argue that there is a difference between the theoretical assumption that questions are of importance in the field of history education and the state of research on how to conceptualise, develop and support the ability to ask good historical questions. From a history teacher's perspective, it would be desirable to address this gap, as studies in educational sciences suggest that encouraging students to generate their own questions can increase their interest (Alexander, 2003; Alexander et al., 1995; Chin and Osborne, 2008; Hidi and Renninger, 2006) and their understanding of the subject matter (Chin and Osborne, 2008; Rosenshine et al., 1996). Moreover, self-generated student questions can be used by teachers to assess students' learning processes, for example, by making it apparent which learned concepts students incorporate into their questions (Dori and Herscovitz, 1999; Offerdahl and Montplaisir, 2014).

Drawing on German- and English-speaking discourses in which the authors of this article are involved, the main objective of this systematic literature review is to provide the first comprehensive overview of empirical research on historical questioning published between 1991 and 2024 in the field of history education and its relevant disciplines (for example, psychology or educational sciences), situated against the background of existing theories in these fields. Based on this overview, we attempt to operationalise components and quality characteristics of questioning to outline an analytical framework in the discussion section. From this, implications for research and schools are derived with the aim of reducing the aforementioned gap.

## Theoretical background

Historical questioning is recognised as an important element of theories of historical thinking in both German- and English-speaking contexts (Bracke et al., 2018; Brauch, 2016; Gautschi, 2009; Körber et al., 2007; Kühberger, 2016; Nitsche and Waldis, 2016; van Drie and van Boxtel, 2008; VanSledright, 2014). In this section we begin with an overview of the significance of, and different approaches to, historical questions in English- and German-speaking contexts, before highlighting the similarities. Next,

we present the cognitive psychological questioning theories of Dillon (1988, 1990) and van der Meij (1994). We then provide an overview of the similarities, differences and gaps between historical and psychological approaches to questioning, and the resulting research needs.

## History education approaches

### English-speaking approaches

In English-speaking approaches, historical questions are often defined as a subjective construct that structures and combines cognitive activities (for example, where could I find these sources and accounts?) and historical concepts (for example, what does 'Middle Ages' mean?) to generate historical understanding (VanSledright, 2014). van Drie and van Boxtel (2008) conceptualise historical questions as verbal acts directed towards the past which represent either the starting or end point of a historical reasoning process. Questions are used to describe (for example, what happened during the French Revolution?), compare (for example, what are the differences between the industrialisation of Europe and China?), explain (for example, why did the First World War begin?) and evaluate (for example, what were the most important reasons for the Second World War?) historical phenomena (van Drie and van Boxtel, 2008). As with VanSledright (2014), the different questions can be asked in relation to different historical reasoning activities, such as the use of sources or of meta-concepts, that provide information about the past (for example, is this a reliable source?). As an initial impetus for historical questioning, the identification of discrepancies or deficiencies in one's understanding of the past is often assumed (van Drie and van Boxtel, 2008).

### German-speaking approaches

In older German-speaking studies, authors understand historical questions as a method for acquiring knowledge and structuring lessons (Klewitz, 1997). Moreover, some studies classify questions according to their phenomenology – for example, those interrogating the constructed nature of history (Fina, 1975). Nowadays, most scholars in German-speaking history education conceptualise historical questions in line with Rösen's (1987) understanding of historical narrative as a means of relating one's self in time for practical life orientation (for example, how does the collapse of the Soviet Union affect us today?). Thus, the authors of the FUER (Förderung und Entwicklung reflexiven Geschichtsbewusstseins/Fostering and developing reflective historical consciousness) model of historical thinking conceptualise historical questions as an expression of uncertainty that requires individuals to engage with history and the past in order to improve their orientation in the present and future (Körber et al., 2007). In the absence of this linkage between past and present, questions are considered to have a limited historical dimension (Bracke et al., 2018; Brauch, 2016; Kühberger, 2016; Pandel, 2010; Trautwein et al., 2017; van Norden, 2014). Further aiming to connect the German-speaking discourse to the English-speaking discourse, Nitsche and Gollin (2020, p. 315) follow a broad concept of narrativity from which a wider understanding of historical questioning can be derived. The authors emphasise that 'even statements about the past – which are recognizable as such solely through verb tense or the mention of historical aspects – fall under the narrative paradigm, as they refer to historical times, aspects, or narratives'. They argue that 'such linguistic-symbolic constructs can be regarded as part of historical narratives, presupposing at least the recognition of historical time, even if they do not formally constitute historical narratives themselves'. In this sense, historical questions do not necessarily have to refer explicitly to the present. There is a distinction in the German-speaking context between a *narrow*, orientation-based understanding of historical questions and a *broad* interpretation. However, as in the English-speaking context, questions can be the trigger for or the result of a historical thinking process (Körber et al., 2007; Nitsche and Gollin, 2020). Furthermore, although there are different understandings of historical questions, historical questioning is often conceptualised as an interwoven process since it incorporates other historical thinking operations, such as deconstruction and reconstruction (Körber et al., 2007; Nitsche and Gollin, 2020), and metahistorical concepts, such as continuity and change (Nitsche and Gollin, 2020; for the English version, see Nitsche and Waldis, 2022).

In sum, several theories of history education in English and German emphasise the importance of historical questions and questioning (Körber et al., 2007; Nitsche and Gollin, 2020; van Drie and van Boxtel, 2008; VanSledright, 2014). Although there is no uniform definition, historical questions are

often regarded as learnable oral or written acts that implicitly or explicitly link the present with the past and address uncertainties and irritations arising from confronting history (for example, historical media) (Bracke et al., 2018; Körber et al., 2007; van Drie and van Boxtel, 2008; VanSledright, 2014). Furthermore, historical questions and historical questioning are interconnected with other domain-specific operations (Körber et al., 2007; van Drie and van Boxtel, 2008) and with metahistorical concepts (Nitsche and Gollin, 2020; VanSledright, 2014). Historical questioning is mostly conceptualised as a cyclical process that can be the starting or ending point of historical thinking (Körber et al., 2007; Nitsche and Gollin, 2020; van Drie and van Boxtel, 2008).

## Psychological approaches

Although several psychologists have studied cognitive aspects and mechanisms of questioning (Flammer, 1981; Flammer et al., 1981; Graesser et al., 1992), only Dillon (1988, 1990) and van der Meij (1994) offer general insights into the entire questioning processes. Dillon (1988, 1990) conducted research in disparate social contexts, such as schools or courts, to examine the cognitive causes, prerequisites and processes that underpin the act of questioning. The key features of Dillon's questioning model can be divided into four steps: (1) the experience of perplexity, (2) the formulation of a question, (3) the seeking of an answer and (4) the acquisition of knowledge through the interpretation of the response. Dillon (1988) defines (1) 'perplexity' as 'an organismic experience' (p. 18) that results of an observation incongruous with our existing knowledge. This incongruence may be the starting point for posing a question. Subsequently, (2) the question must be grammatically formulated and orally expressed. The two final stages, (3) seeking an answer and (4) learning in terms of acquiring knowledge, entail the pursuit of information that resolves the question. This knowledge may imbue new meaning, engender new insights or precipitate new moments of perplexity (Dillon, 1988).

In his review of spontaneous student questioning, van der Meij (1994, p. 140) adopted Dillon's questioning processes and focused on his first three stages. The initial stage is 'the onset of questioning (perplexity)', which is prompted by internal (for example, contradiction) or external (for example, surprising facts in a textbook) factors creating a disjunction between the new and previous perceptions, leading to an experience of perplexity. The second stage, 'the development of a question (asking)', commences with the 'interrogative mood' (van der Meij, 1994, p. 140). Before the verbalisation of a question takes place an individual 'must come to grips with what perplexes and make it more tangible' (van der Meij, 1994, p. 144). The aim of this interrogative mood is 'finding the problem area ... that enables the person to start a creative attack to the problem' (van der Meij, 1994, p. 145). Subsequently, the question must be formulated and expressed. In the absence of the interrogative mood or the verbal ability to construct a question, instances of perplexity are not followed by questions. van der Meij (1994) posits that this cognitive step is pivotal and the most demanding aspect of the questioning process. Once the moment of perplexity has been made 'tangible', the subject proceeds to construct the question by searching for the appropriate grammatical words and structure. The second stage concludes with the expression of the question. The third stage, which encompasses 'the search for and processing of an answer (answering)', describes the way the subject searches for potential answers and reacts to them (van der Meij, 1994, p. 140).

## Similarities, differences and gaps between historical and psychological questioning approaches

Several similarities between concepts of historical questioning (Körber et al., 2007; Nitsche and Gollin, 2020; van Drie and van Boxtel, 2008) and the psychological approach of Dillon (1988, 1990) and van der Meij (1994) can be stated. They both agree that questioning is partly a cognitive process that can be expressed verbally. Additionally, both see questioning as a process that involves prerequisites and requires different components (for example, irritation) to be brought together. Furthermore, historical questions are considered to be an expression of irritation (Körber et al., 2007; Nitsche and Gollin, 2020; van Drie and van Boxtel, 2008). This understanding of question triggers overlaps with the generic concepts of perplexity proposed by Dillon (1988, 1990) and van der Meij (1994), and like Dillon (1988, 1990) and van der Meij (1994), several domain-specific questioning understandings (Körber et al., 2007; van Drie and van Boxtel, 2008; VanSledright, 2014) consider questions to be the possible starting and end point of thinking processes.

Besides the similarities, generic psychological questioning theories do not address domain-specific aspects. The main difference between generic and history education-specific questioning understandings is that the latter implicitly or explicitly link the present with the past and address uncertainties and irritations arising from confronting history (for example, historical media). Consequently, it is unclear what role domain-specific operations (for example, corroboration, sourcing) play and how they relate, for instance, to metahistorical concepts described in history education theories (Nitsche and Gollin, 2020; VanSledright, 2014).

Furthermore, it remains uncertain how the domain-specific operations could be related to Dillon's (1990, 1988) and van der Meij's (1994) questioning components. Moreover, although Dillon (1990, 1988) and van der Meij (1994) describe the general questioning process, they do not elaborate on its possible qualitative characteristics. It is therefore also unclear which (domain-specific) criteria serve as qualitative characteristics for the learning of historical questioning processes. This considerable lack of knowledge hinders the nuanced description of questioning and its development, as well as the systematic teaching of students on how to ask historical questions.

## Methods

### Main questions and review process

Based on the research gaps identified, we ask the following questions:

1. What studies in history education and related fields are available on the questioning process?
2. What operations, qualitative characteristics of the process and operations of historical questioning are outlined in the available studies?
3. To what extent can the results be adapted to an analytical framework for research on historical questioning?

This literature review was conducted in accordance with the PRISMA statement (<https://www.prisma-statement.org/>) and is intended to provide an overview of the reviewed research discourse. Consequently, only peer-reviewed articles and monographs, such as dissertations, were searched. As we are interested in studies that contribute to an understanding of historical questioning operations or processes from cognitive or learning-psychological perspectives, as well as how this understanding is achieved in discourse on historical thinking, we do not consider articles focusing on classroom interaction processes (Mehr, 2013), the types of questions in school textbooks (Katzier, 2023) or the effects of historical questions on the epistemological beliefs of students (Behrendt and Brauch, 2018, 2020). Moreover, we do not consider the answering phases of questioning (for example, stages three and four according to Dillon, 1988), because these have already been operationalised extensively in models of history education (discussed earlier) and empirical studies (Wineburg, 1991a, 1991b, 1998). In this way, we address the process up to the point where individuals have constructed their historical questions, even though this process is ideal-typically unfinished, since historical thinking is expected to raise new questions (Körber et al., 2007; VanSledright, 2014). Since our focus was on cognitive operations and thinking processes, we were particularly interested in think-aloud studies. Moreover, to identify potential qualitative criteria, we also focused on expert–novice studies, based on the assumption that historical questioning is a socio-constructivist process that can be taught and learned.

According to previous review articles in the field of English-speaking history education (Luís and Rapanta, 2020; Metzger and Harris, 2018; Monte-Sano and Reisman, 2016), Wineburg's series of studies (1991a) remains the first in-depth contribution on how questions are linked to the various operations of historical thinking (for example, corroboration). For German-speaking literature, we chose Thünemann's (2009) review of historical questioning as our starting point. This is because it is the most recent review to be published in a German-speaking country, and it also considers non-peer-reviewed studies. This is important because many articles on this topic published in German-speaking publications before the 2010s were not peer-reviewed. Thünemann's (2009) review also makes it clear that, although there are some theoretical considerations and empirical studies on questions in textbooks, there are no studies that operationalise the historical questioning process or empirically examine its role in historical thinking. Consequently, the search horizon encompassed the time from 1991 to December 2024 for the English-speaking and 2009 to December 2024 for the German-speaking context. The first search

was conducted in January 2023. A subsequent search was conducted in December 2024, encompassing newly published texts between 2023 and the end of 2024.

To identify the pertinent literature, the electronic databases ERIC (<https://eric.ed.gov/>), APA PsycINFO (<https://www.apa.org/pubs/databases/psycinfo/>) and peDOCS (<https://www.pedocs.de/>) were selected to analyse research of both the English and German-speaking contexts. The evolution of the search string was guided by the procedural recommendations of Purssell and McCrae (2020). By identifying keywords and searching for synonyms, the objective was to guarantee the most comprehensive and complete literature search feasible. Due to disparate languages, input functions and evaluation patterns of the databases, the search strings diverge from one another (see Box 1).

### Box 1. Search strings for the electronic databases ERIC, APA PsycNET and peDOCS

Search string ERIC: (title:question OR title:ask) AND (process OR procedure OR proceeding OR develop OR operation OR theor) AND (analy OR track OR examin OR investigat OR explor OR scrutiniz OR study OR develop OR evolution OR understand OR describe) AND (component OR element OR framework OR operation OR stag OR steps OR progression OR typ) pubyearmin:1991; Results: 135

Search string APA PsycNET: ((Title: question OR Title: ask) NOT Title: Questionnaire) AND (Abstract: process\* OR Abstract: procedure\* OR Abstract: proceeding\* OR Abstract: develop\* OR Abstract: operation\* OR Abstract: theor\* OR Abstract: analy\* OR Abstract: track\* OR Abstract: examin\* OR Abstract: investigat\* OR Abstract: explor\* OR Abstract: scrutiniz\* OR Abstract: study\* OR Abstract: evolution\* OR Abstract: understand\* OR Abstract: describe\* OR Abstract: component\* OR Abstract: element\* OR Abstract: framework\* OR Abstract: stag\* OR Abstract: steps\* OR Abstract: progression\* OR Abstract: typ\*) AND Peer-Reviewed Journals only AND Year: 1991 To 2024; Results: 199

Search string peDOCS: ( ( ( Jahr >=2009 und <=2024) und (Schlagwörter: FRAGETECHNIK oder NACHFRAGETHEORIE oder SCHUELERFRAGE oder FRAGESATZ oder FRAGEVERHALTEN oder NACHFRAGEENTWICKLUNG) ) oder (Titel: FRAGE\*) ) und (Sprache: deutsch oder englisch) ) und (Begutachtungsstatus: Peer-Review oder "Qualifikationsarbeit (Dissertation, Habilitationsschrift)" oder "Abschlussarbeit (Bachelor, Master, Diplom, Magister)"), Results: 82

If articles were not available through the electronic databases, the study authors were contacted via ResearchGate, LinkedIn or directly by email. The articles were assessed by the first and second authors in three rounds comprising:

1. examination of the titles and abstracts regarding consideration of questioning processes (29 of 416 articles selected)
2. review of the texts identifying statements pertaining to the (a) operations or similar constructs (for example, components, steps) of the questioning process, (b) the qualitative categorisation of these constructs, or statements on question types if they were expected to represent sophisticated outcomes of questioning (six of 29 articles selected)
3. examination of the methods and the extent to which they provide detailed information about the processes. These methods included thinking aloud, interviews and longitudinal designs (one of six articles selected).

In the event of a discrepancy, a consensus decision was reached. Ultimately, the text corpus consisted of one non-domain-specific study (Kaberman and Dori, 2009). Subsequently, the bibliographies of studies containing statements pertaining to operations of questioning, the questioning process or their qualitative categorisations were analysed for the purpose of identifying additional studies that could be useful for the review. Furthermore, the bibliography of Logtenberg (2012) was useful as a starting point for additional research. Overall, 286 articles were found. The selection procedure was identical to that employed for the database articles. This process yielded an additional six non-domain-specific and 14 domain-specific articles. The principal reason for the discovery of a considerable number of supplementary articles through the examination of bibliographies is that the original articles did not address the subject of questioning processes directly and thus did not include the keywords *Frag\** or *question\** in their titles or abstracts. In total, 21 studies were subjected to comprehensive analysis.

To achieve this, the studies were uploaded to MAXQDA (<https://www.maxqda.com/>) and the results pertinent to the article were categorised by the first author. Passages were identified that addressed

operations of the questioning process, qualitative characteristics that differentiate these operations or the questioning process itself. Subsequently, the second author undertook an examination of the selected passages to ascertain their relevance. In the event of a discrepancy of opinion, a further decision was reached by consensus. Throughout the analysis, we relied on a broad understanding of narrativity and historical questioning (see 'History education approaches') to consider the various research fields (for example, history, education and psychology) and their different conceptual starting points.

## Results

The first question of the literature review is answered on the basis of an overview list of the analysed articles (see Table 1). The individual articles are then subjected to a detailed examination to ascertain the second research question. The third question is addressed in the discussion section to develop an analytical framework.

### Operations of the questioning process

In the course of the analysis of 14 domain-specific studies, it was found that 11 of these contain statements on operations of questioning, while 11 include statements to categorise the operations, processes or questions qualitatively. Of the seven non-domain-specific studies analysed, five include statements about operations of questioning, while six articles address qualitative issues. For the non-domain-specific studies, the statements about operations and quality can be linked back to question theories (Pedrosa de Jesus et al., 2003, 2006) or have emerged as part of the development of such constructs (Graesser and Olde, 2003; Otero and Graesser, 2001). However, the conceptualisations are not identical. The theoretical background and questioning definition are only in three domain-specific studies mentioned (Logtenberg, 2012; Portnoy and Rabinowitz, 2014; Schobinger et al., 2023). Therefore, the theoretical background and question definition of domain-specific studies are often unclear or absent. For instance, no study could be found that employed the narrow definition of historical questioning common in the German-speaking context. However, the range of questioning conceptions or applications covered by the review aligns with a broad understanding of historical questioning (see 'History education approaches'). The following sections present the questioning operations with reference to the questioning model of Dillon (1988, 1990) and van der Meij (1994). Thus, three main questioning operations are distinguished: (a) *experiencing perplexity*, (b) *expliciting perplexity* and (c) *expressing the question*. The sections trace these operations starting with non-domain-specific studies, followed by domain-specific studies.

#### *Experiencing of perplexity*

From a psychological perspective, Graesser and McMahan (1993) and Otero and Graesser (2001) examine the triggers of questioning processes. Graesser and McMahan (1993) suggest that the ability to ask questions depends on the perception and recognition of perplexity. They claim that anomalies are caused by discrepancies (for example, contradiction) arising from the comparison of newly received information with existing knowledge. Building on this suggestion, Otero and Graesser (2001) developed the PREG model (*pregunta* is Spanish for question). They examined the mechanisms that trigger anomalies or questions in expository texts. The authors followed van Dijk and Kintsch (1983) and Johnson-Laird (1983), which posit that readers construct text representations at three distinct levels to facilitate discourse comprehension. The surface level refers to the comprehension of words and textual structures. The textbase level refers to the reception of the explicit text content by means of inferences. The situation model refers to the linking of the text content with existing knowledge (Otero and Graesser, 2001). Otero and Graesser (2001) found that each of these levels could serve as question triggers.

**Table 1. Overview of studies on (historical) questioning**

No.	Study	Participants	N	Type of study	Domain-specific	Related to questioning theory	Statements on operations or similar constructs	Statements on the quality of the operations or questioning process
1	<a href="#">Wineburg, 1991a</a>	US high school students, grade 11; historians (doctoral candidates or with a PhD)	16	Process study, novice–expert comparison, qualitative (thinking aloud method)	✓		✓	✓
2	<a href="#">Wineburg, 1991b</a>	US high school students, grade 11; historians (doctoral candidates or with a PhD)	16	Process study, novice–expert comparison, qualitative (thinking aloud method)	✓		✓	✓
3	<a href="#">Graesser and McMahan, 1993</a>	US undergraduate students in psychology	70	Quasi-experiment, mixed method (among others, developing of questions, rating of questions, variance analysis)		✓	✓	
4	<a href="#">Leinhardt and Young, 1996</a>	US historians (with topic expertise)	3	Process study, expert–expert comparison, qualitative (thinking aloud method)	✓		✓	✓
5	<a href="#">Wineburg, 1998</a>	US historians with PhD (one with topic expertise, one without)	2	Process study, expert–expert comparison, qualitative (thinking aloud method)	✓		✓	✓
6	<a href="#">Afflerbach and VanSledright, 2001</a>	US elementary school, grade 5	7	Process study, qualitative (thinking aloud method)	✓		✓	
7	<a href="#">Otero and Graesser, 2001</a>	Portuguese[?] students, grades 8 and 12	N/A authors overtake dates of Costa (1997)	Quasi-experiment, mixed method (i.e. developing of questions, qualifying of questions by coding)		✓	✓	✓
8	<a href="#">Pedrosa de Jesus et al., 2003</a>	Portuguese undergraduate students in chemistry	32	Quasi-experiment, qualitative (developing of questions, qualifying of questioners by hermeneutic interpretation)		✓		✓

9	Graesser and Olde, 2003	US college students in psychology	108	Process study, mixed methods (writing aloud, developing of questions, qualifying of questions by rating)		✓	✓	✓
10	van Boxtel and van Drie, 2004	Dutch students in the third pre-vocational education; high school students, grade 5; history teachers (master's degree)	74	Process study, novice–expert comparison, qualitative (thinking aloud method)	✓		✓	✓
11	Graesser et al., 2005	US college students in psychology	40	Process study, mixed methods (developing of questions, eye tracking, qualifying of questions)		✓	✓	✓
12	Pedrosa de Jesus et al., 2006	Portuguese undergraduate students in chemistry	100	Explorative study, qualitative (developing of questions, qualifying questions by hermeneutic interpretation)		✓		✓
13	Kaberman and Dori, 2009	Israeli high school students, grade 12	931	Quasi-experiment, mixed method (developing of questions, qualifying questions by rating and hermeneutic interpretation)		✓	✓	✓
14	Logtenberg, 2012	Dutch high school students, different grades	174	Process study, novice–expert comparison, qualitative (thinking aloud method, developing of questions, coding of questions)	✓	✓	✓	✓
15	Portnoy and Rabinowitz, 2014	US elementary school students, grade 3; middle school student, grade 8; high school students, grade 10	171	Quasi-experiment, mixed methods (developing of questions, coding of questions)	✓	✓	✓	
16	Schneider and Zakai, 2016	Graduate students and doctoral students in history	10	Process study, novice-expert–expert comparison, qualitative (interview, coding of questions and hermeneutic interpretation)	✓		✓	
17	Cameron et al., 2017	US undergraduate students in psychology	151	Quasi-experiment, mixed method (developing of questions, qualifying questions by coding)	✓			✓

18	<a href="#">Thyroff, 2020</a>	Swiss and German museum visitors, different ages	18	Process study, qualitative (thinking aloud method)	✓	✓	✓
19	<a href="#">Goulding, 2021</a>	Australian university students in a teacher education programme, doctoral historians	8	Process study, novice–expert comparison, qualitative (thinking aloud method)	✓	✓	✓
20	<a href="#">McGrew, 2022</a>	US doctoral historians, fact checkers; undergraduate students (different majors)	45	Process study, novice–expert comparison, qualitative (thinking aloud method)	✓	✓	✓
21	<a href="#">Schobinger et al., 2023</a>	Swiss German school students, grade 9, lay persons, history students, doctoral historians	8	Process study, novice–expert comparison, qualitative (thinking aloud method, developing of questions, coding of questions)	✓	✓	✓

In history education, [Thyroff \(2020\)](#) analysed how museum visitors engage with historical content. She found question triggers that are crucial for engaging with historical content. The results are consistent with the non-domain-specific studies mentioned earlier. For instance, ambiguity and irritation, in relation to both the historical content and the exhibition, were identified as factors of historical questioning. [Thyroff \(2020\)](#) also identified a lack of coherence between the textual and visual elements of the exhibition as a trigger for questions. In his study, [Logtenberg \(2012\)](#) analyses perplexity based on a sample of high school students. He synthesises the studies of [Otero and Graesser \(2001\)](#) and the theories of [van der Meij \(1994\)](#) and [Dillon \(1988, 1990\)](#), which focus on the cognitive aspects (for example, knowledge deficit) of the questioning process, with affective ([Hidi and Renninger, 2006](#)) and domain-specific reasoning concepts ([Alexander, 2003](#)). In this context, [Logtenberg \(2012\)](#) situates the questioning process within the 'model of domain learning (MDL)' of [Alexander et al. \(1995\)](#) to link it to the advancement of expertise. In the model the capacity to identify problems and knowledge gaps is regarded as a fundamental aspect of the questioning process, which is seen as a key driver of knowledge development within a given field. Consequently, the nature of the question serves as an indicator of expertise. The primary factors that contribute to the development of expertise are interest, strategic processing and knowledge. These factors interact with one another. For example, a strategic process may lead to increased knowledge, which in turn may enhance interest ([Alexander, 2003](#); [Alexander et al., 1995](#)). [Logtenberg](#) therefore applies 'the four-phase model of interest development' of [Hidi and Renninger \(2006\)](#) to questioning. They find that the specific type of interest is an indicator of the level of interest in a particular topic. They also suggest that interest evolves from a state of situational interest to a more mature individual interest. Consequently, a moment of perplexity may indicate situational interest, triggered by external factors such as engaging texts, or triggered by individual interest, indicating greater expertise. To further conceptualise internal perplexity, [Logtenberg \(2012\)](#) follows [Alexander \(2003\)](#), who associated it with domain-specific questions or domain-specific reasoning processes. On this basis, the author links internal perplexity to historical reasoning ([van Drie and van Boxtel, 2008](#)). Moreover, in his description of perplexity, [Logtenberg \(2012\)](#) distinguishes between three cognitive (knowledge deficit, knowledge conflict, association) and four affective (interest, indignation, astonishment, empathy) characteristics. He also indicates that historical questioning processes can be stimulated from four domain-specific modes of historical reasoning, namely contextualisation, comparison, causal reasoning and argumentation. Additionally, he found that students with greater prior knowledge and higher levels of general and situational interest tend to pose more questions. Furthermore, [Logtenberg \(2012\)](#) asserts that most of these questions are prompted by knowledge deficits and frequently lack historical reasoning. [Wineburg's \(1991a, 1991b\)](#) studies support [Logtenberg's \(2012\)](#) findings. They show that experts use more questions than novices and that experts use operations of historical thinking (for example, sourcing) to identify knowledge conflicts and gaps that stimulate questions.

To sum up, the expression of perceived irritation can be attributed to three cognitive aspects ([Graesser and McMahan, 1993](#); [Logtenberg, 2012](#); [Otero and Graesser, 2001](#)). First, it can result from knowledge deficits, as illustrated by a student's remark: 'Well, I don't know. Apparently, England is more developed than Germany. But I don't know for sure, that's why I underlined it. I don't really understand it' ([Logtenberg, 2012](#), p. 51). Second, affective factors such as interest play a role, for example: 'Um, yes, I think that's because it interests me. I am curious about working conditions. Well, um, I think things like child labour, for example, are topics that I find fascinating. How do I explain that?' (p. 52). Third, additional operations of historical thinking, such as contextualisation, are involved, as shown in the comment: 'The period, I think about 1700, 1800, when the steam engine appeared in England, I think. Yes, when things improved technically. That's what comes to mind' (p. 49).

### **Expliciting perplexity**

Psychological research (for example, [Graesser and McMahan, 1993](#)) found that the mere experience of anomalies is not sufficient to formulate a question. For them, it is crucial to be able to formulate and reflect on as well as locate the anomalies and perplexities in prior knowledge to translate the affective and cognitive triggers into a question. Individuals with greater prior knowledge are more likely to verbalise their perplexity ([Graesser and McMahan, 1993](#)) and distinguish more purposefully between their existing knowledge and the new information ([Graesser and Olde, 2003](#); [Graesser et al., 2005](#)). In addition, a study of high school chemistry classes conducted by [Kaberman and Dori \(2009\)](#) suggests that

the process of explicating perplexity also takes the form of meta-questions containing metacognitive structuring (for example, self-monitoring) of the questioning process and the question itself. Therefore, explicating perplexity can be differentiated into two sub-operations: (a) reflecting on and structuring prior knowledge, and (b) reflecting metacognitively on the question and the questioning process itself in order to structure it.

The reflection and monitoring of perplexity is implicitly also mentioned in various domain-specific studies (Goulding, 2021; Leinhardt and Young, 1996; McGrew, 2022; Schneider and Zakai, 2016; van Boxtel and van Drie, 2004; Wineburg, 1991a, 1991b, 1998), even though links to theories of questioning are missing. Wineburg (1998) found that persons with in-depth expertise specify their ignorance. 'Specification of ignorance', Wineburg (1998) writes, 'refers to instances when historians explicitly acknowledged confusion, expressed puzzlement or wonder, asked questions, or specified gaps in knowledge' (p. 325). During specifying ignorance, historians apply domain-specific heuristics (for example, corroboration) to investigate perplexity. Wineburg (1991a, 1991b, 1998), Leinhardt and Young (1996), Goulding (2021), McGrew (2022) and Schneider and Zakai (2016) also provide insights into the metacognitive dimension of specifying ignorance. Their studies found that experts employ metacognitive (for example, What do I know about this issue?) and procedural questions (for example, What should I do next?) to delineate their own level of knowledge. Compared with novices, they tend to pose a great number of metacognitive and procedural questions to structure the acquisition of knowledge in a systematic way. This enables experts relative to novices to ask more in-depth content-related questions that are linked to their existing knowledge base (Goulding, 2021; McGrew, 2022; Wineburg, 1991a, 1991b).

In conclusion, the act of explicating perplexity could address the affective or cognitive perplexity triggered by historical media (for example, "'Capable of thinking like White men.'" This is a baffling statement. I have to think about it. I want to read it over again' (Wineburg, 1998, p. 335)). Alternatively, it could structure and reflect the questioning process or the question itself metacognitively (for example, 'Does that mean that they have never been enslaved or that they are so far from slavery that they don't think as if they have ever been slaves? I've got to read it again. I think too much has been taken out of it for me to appreciate exactly what's going on in that paragraph' (Wineburg, 1998, p. 335)).

### **Expressing the historical question**

Non-domain-specific studies outline that the final question is expressed after the perplexity has been experienced (Graesser and McMahan, 1993; Otero and Graesser, 2001) and verbalised (Graesser and McMahan, 1993) or reflected on in terms of content and prior knowledge (Graesser and Olde, 2003; Graesser et al., 2005). According to Otero and Graesser (2001, pp. 153–61), expressed questions can be categorised as follows: at the 'word level' a reader does not understand the meaning of a particular word in the text; at the 'statement level' a reader understands the single words but is uncertain about the intention of the text; and at the 'link level' a reader understands the statement of the text but cannot link it to their 'world knowledge'.

In the field of history education, Logtenberg (2012, p. 29) follows van Drie and van Boxtel (2008) and states that the expressed questions of the analysed high school students had a 'descriptive', 'explanative', 'comparative' or 'evaluative' character. Predominantly, the school students formulated descriptive and explanative questions, which are designed to explore the historical context, and less comparative and evaluative questions (Logtenberg, 2012), which theoretically should lead to deeper historical reasoning (van Drie and van Boxtel, 2008). This finding is consistent with the results reported by Afflerbach and VanSledright (2001) and Portnoy and Rabinowitz (2014). The latter also found that, compared with science, students of different ages predominantly asked questions to request supplemental information when engaging with history. Nevertheless, expert studies on historical thinking conducted by Leinhardt and Young (1996) and Wineburg (1991a, 1991b, 1998) suggest that historians pose questions that connect their prior knowledge with historical documents in order to expand – following van Dijk and Kintsch (1983) and Johnson-Laird (1983) – their situation models of past phenomena with the aim of evaluating historical content.

In summary, research suggests that unlike historians (Leinhardt and Young, 1996; Wineburg, 1998), school and high school students take the narratives for granted and do not express questions, for example, about the author's motives (Afflerbach and VanSledright, 2001; van Boxtel and van Drie, 2004).

Rather they tend to ask questions to request more information to contextualise the historical content (Portnoy and Rabinowitz, 2014) (for example, 'How much did factory workers earn?' (Logtenberg, 2012, p. 29)), while particularly evaluative questions (for example, 'Has the world improved because of the Industrial Revolution?' (Logtenberg, 2012, p. 29)) are seldom asked (Logtenberg, 2012).

## Quality characteristics for questioning processes and operations

Based on the assumption that historical questioning is a socio-constructivist process that can be taught and learned (see the 'Methods' section), the quality characteristics can be identified by examining the performance of subjects with different levels of expertise. The following section outlines research that addresses the qualitative characteristics of the entire questioning process. Subsequently, the studies that make statements on the quality characteristics of operations are discussed. Again, non-domain-specific articles are presented first, before studies in history education are related to them.

### Quality characteristics for questioning processes

Four studies indicate some quality characteristics from a non-domain-specific perspective. However, the works of Graesser and Olde (2003) and Graesser et al. (2005) show that people with higher expertise, due to their greater prior knowledge, filter useful information from useless information more quickly when reading and thus focus more on relevant information during the questioning process than people with less expertise. Additionally, the findings of Pedrosa de Jesus et al. (2003, 2006) suggest that individuals with increased expertise engage in parallel cognitive operations, such as recognising similarities between concepts, comparing with previous knowledge and integrating new information into the existing knowledge system, with the questioning process when reading a text.

Similar observations have been made in the field of history education. The studies by van Boxtel and van Drie (2004) and Schobinger et al. (2023) suggest that experts recognise more concepts and connections faster than novices due to their prior knowledge in terms of content and operations (for example, corroboration). Moreover, Wineburg (1991a, 1991b), McGrew (2022), Goulding (2021) and Schobinger et al. (2023) state that domain-specific heuristics or operations (for example, sourcing) not only occur synchronously during the questioning process among experts, but that they also employ them more frequently and with greater precision, often in an iterative manner, than non-experts (Schobinger et al., 2023). In this respect Thyroff (2020) indicates that questioning processes of adult museum visitors are rarely structured and linked so that the questioning processes are momentarily and not specifically deepened. Furthermore, Wineburg (1991a, 1991b) as well as van Boxtel and van Drie (2004), Goulding (2021), McGrew (2022) and Schobinger et al. (2023) suggest that experts reflect their working process constantly whereas novices reflect it punctually.

These findings suggest that the historical process of questioning as a whole can be differentiated according to the following key factors: the presence and frequency of the historical operations involved (Goulding, 2021; McGrew, 2022; Schobinger et al., 2023; Wineburg, 1991a, 1991b); their simultaneous connection with the recognition of historical concepts (Schobinger et al., 2023; van Boxtel and van Drie, 2004); the structure of the process (for example, synchro-iterative) (Goulding, 2021; McGrew, 2022; Schobinger et al., 2023; Wineburg, 1991a, 1991b); the deepening of the questioning process (Schobinger et al., 2023; Thyroff, 2020); and, finally, their degree of reflection (Goulding, 2021; McGrew, 2022; Schobinger et al., 2023; van Boxtel and van Drie, 2004; Wineburg, 1991a, 1991b).

### Quality characteristics on experiencing perplexity

Regarding moments of perplexity, no non-domain-specific studies have been conducted that qualitatively analyse the question triggers in depth. Only Logtenberg's (2012) domain-specific study suggests that perplexity, embedded in historical reasoning processes, may lead to more sophisticated questions in high school students than those related simply to prior knowledge (for example, knowledge deficits) or affects (for example, indignation). In addition, he found that affective triggers often lead to emotive questions which 'reflected incorrect assumptions or did not take into account the specific time and context of the historical event' (Logtenberg, 2012, p. 35). Although Logtenberg (2012) does not explicitly categorise the experiences of perplexity in a qualitative way, these findings suggest that qualities of perplexity can be differentiated according to whether they are based on

factual-affective aspects or embedded in historical reasoning (for example, contextualisation). However, explicit qualitative categorisations of the onset of questions are still lacking.

### **Quality characteristics of expliciting perplexity**

The number of non-domain-specific studies of quality characteristics for structuring and reflection of perplexity is also limited. The outcomes of [Graesser and McMahan \(1993\)](#), [Graesser and Olde \(2003\)](#) and [Graesser et al. \(2005\)](#) indicate that prior knowledge about the reflected topic and the capacity to reflect and articulate perplexity are fundamental prerequisites. [Kaberman and Dori \(2009\)](#) suggest that students who link metacognitive strategies (for example, monitoring) to their prior knowledge during the formulation process and reflect on the questioning process using domain-specific levels of understanding (for example, macroscopic) show improved knowledge acquisition. In this sense, the presence and frequency of the reflection on the topic itself and the metacognitive reflection on the question(-process) can be seen as a qualitative characteristic of expliciting perplexity.

Similar findings are indicated in studies in the field of history education ([Goulding, 2021](#); [McGrew, 2022](#); [Wineburg, 1991a, 1991b](#)). Although their findings are not tied back to question theory, their comparisons of novices and experts show that experts tend to specify their ignorance more often through the use of iterative and structured episodes applying the operations of historical thinking. As they do so, they detach themselves from the explicit content of the media and make conceptual connections between the media and their prior knowledge. According to [van Boxtel and van Drie \(2004\)](#), experts reflect and question their knowledge gaps by using historical concepts (for example, the Berlin Wall), whereas novices simply judge the narratives or take them for granted without reflecting on their knowledge gaps.

In short, the following qualitative characteristics may be used for specification of ignorance: presence and frequency ([Goulding, 2021](#); [Kaberman and Dori, 2009](#); [McGrew, 2022](#); [Wineburg, 1991a, 1991b](#)); structure (for example, iterative-cyclical approach) ([Goulding, 2021](#); [McGrew, 2022](#); [Wineburg, 1991a, 1991b](#)); deepening of concepts ([van Boxtel and van Drie, 2004](#)); and linking with historical thinking operations ([Goulding, 2021](#); [McGrew, 2022](#); [Wineburg, 1991a, 1991b](#)).

### **Quality characteristics on expressing the historical question**

No empirical studies directly address the qualitative characteristics of the question expression process. The studies focus more on the quality of the questions formulated than on the questioning process. Therefore, it is often the question product, rather than the questioning process, that is qualified and typified. Therefore, the connection to the expressing processes is loose. What is known from the non-domain-specific literature is that the expressing processes are linked to the various levels of knowledge representation. Questions concerning textual structures appear to represent the lowest level, while those that link text content with existing knowledge (situation model) appear to represent the highest level ([Otero and Graesser, 2001](#)). [Pedrosa de Jesus et al. \(2003, 2006\)](#) also differentiate between questions that are designed to facilitate textual comprehension (for example, confirmation questions, superficial questions) and higher-order questions (for example, transformation questions, integration questions) that link the expressing process to new information with existing knowledge structures and reorganise these.

In the context of history education, [Wineburg \(1991a, 1991b, 1998\)](#), [Leinhardt and Young \(1996\)](#), [van Boxtel and van Drie \(2004\)](#), [Goulding \(2021\)](#) and [McGrew \(2022\)](#) show that experts, but not novices, integrate their own level of knowledge into their questions. This implicitly suggests that the questions' potential for the integration of prior knowledge can serve as a quality characteristic for expressing a historical question. Furthermore, the studies suggest that experts ask more questions. [Cameron et al. \(2017, p. 342\)](#) derived from [Wineburg's](#) heuristics (1991a) a typology of questions, differentiating between those of a 'low-level' and those of a 'high-level'. The former pertain to facts or emotions, whereas the latter relate to the historical meaning of a document (for example, contextualisation), the author's point of view (sourcing) or the comparison of documents (corroboration) and can be answered only by applying historical thinking operations. Similarly, [Logtenberg \(2012, p. 29\)](#) distinguishes between 'lower-order' and 'higher-order' questions, where higher-order questions express deeper historical reasoning processes (for example, evaluation).

In summary, the extant studies suggest that presence and frequency (van Boxtel and van Drie, 2004; Wineburg, 1991a, 1991b, 1998), the potential for the integration of prior knowledge (Goulding, 2021; Leinhardt and Young, 1996; McGrew, 2022; Pedrosa de Jesus et al., 2003, 2006; Wineburg, 1991a, 1991b, 1998; van Boxtel and van Drie, 2004) and the potential for the application of historical thinking operations (for example, by posing evaluative questions) (Cameron et al., 2017; Logtenberg, 2012) can be used as characteristics of question quality and perhaps also of question expression.

## Discussion

Although questions are theoretically considered central to historical thinking and learning (Bracke et al., 2018; Körber et al., 2007; Nitsche and Gollin, 2020; van Drie and van Boxtel, 2008; VanSledright, 2014), and although some discipline-specific studies (Logtenberg, 2012) have operationalised parts of the historical questioning process, there is still a lack of research that operationalises questioning constructs in a domain-specific way. This gap makes it challenging to systematically foster historical questioning and to assess it qualitatively. In general, we found seven studies from other fields and 14 from history education on (historical) questioning. Although neither an empirically derived model of the complete historical questioning process nor a uniform definition of questioning currently exists, insights can be drawn from both non-domain-specific and domain-specific studies to conceptualise the operations of historical questioning, its quality characteristics and those of the historical questioning process. These insights serve to answer the third main research question of this article, namely, to what extent the results of the systematic literature review can be adapted to form an analytical framework (Table 2). By doing this, we develop the historical questioning operations, processes and their criteria based on an interplay between general theories, studies and works from the field of history education.

Based on both non-domain-specific (Graesser et al., 2005; Kaberman and Dori, 2009) and domain-specific (Logtenberg, 2012; Wineburg, 1991a, 1991b) studies, the framework seems to confirm empirically the similarities and overlaps between generic (Dillon, 1988, 1990; van der Meij, 1994) and domain-specific (Nitsche and Gollin, 2020; VanSledright, 2014) theories (see the section 'Similarities, differences and gaps between historical and psychological questioning approaches'). Specifically, the process of historical questioning can be divided into three main operations derived from Dillon's (1990, 1988) and van der Meij's (1994) preliminary work: (1) experiencing perplexity, (2) explicating perplexity and (3) expressing the historical question. This basic structure can be enriched with generic and domain-specific sub-operations. For example, Logtenberg (2012) has shown that domain-specific operations (for example, contextualisation) and non-domain-specific operations (for example, indignation, knowledge deficit) can characterise the starting points which link two points in time by posing a historical question. The interplay between generic and domain-specific operations is particularly evident in the sub-operations of explicating perplexity. Historical questions are reflected and structured in a subject-specific way using historical operations (for example, sourcing). Conversely, metacognitive aspects are employed to structure (for example, monitoring) the questioning process. These aspects have no temporal references and cannot be assigned to domain-specific methodologies *per se*.

Although it must be acknowledged that few studies show how domain-specific operations or structures of questioning affect question quality, comparisons between individuals with different historical expertise provide insights into the characteristics of the development of historical questioning and its operations. Therefore, the qualitative characteristics mentioned in Table 2 should be seen as initial indicators for evaluating historical questioning and as starting points for constructing developmental frameworks for historical questioning, not as prerequisites for high-quality questions or products of historical thinking. However, the interaction between generic and subject-specific elements also becomes apparent in the qualitative evaluation of sub-operations. For example, non-domain-specific characteristics of *experiencing perplexity* (for example, indignation) embedded in historical thinking (for example, causal reasoning) appear to be an indication of increased expertise (Logtenberg, 2012). Similarly, non-domain-specific quality characteristics (for example, presence of meta-reflection) linked with domain-specific quality criteria (for example, linking with historical concepts) can indicate increased question expertise (Kaberman and Dori, 2009; van Boxtel and van Drie, 2004).

**Table 2. Framework of historical questioning, including quality characteristics**

Operation	Definition	Quality characteristics
(1) experiencing perplexity: (1a) knowledge deficit (1b) knowledge conflict (1c) association (1d) interest (1e) indignation (1f) astonishment (1g) contextualisation (1h) comparison (1i) argumentation (1j) causal reasoning	An expression of a perceived irritation directed at the connection between temporal levels (Nitsche and Gollin, 2020), which can be attributed to cognitive factors such as knowledge deficit (Graesser and McMahan, 1993; Logtenberg, 2012; Otero and Graesser, 2001; van der Meij, 1994), affective factors such as interest (Logtenberg, 2012) and additional operations of historical thinking such as contextualisation (Logtenberg, 2012).	<ul style="list-style-type: none"> <li>● degree of embedding in historical thinking (for example, contextualisation) (Logtenberg, 2012)</li> </ul>
(2) expliciting perplexity: (2a) reflecting on and structuring the perplexity triggers (2b) reflecting on and structuring the historical questioning process	The act of reflecting or monitoring an experience of affective or cognitive perplexity (Graesser and McMahan, 1993; Wineburg, 1998) triggered by historical materials (Goulding, 2021; Graesser and Olde, 2003; Graesser et al., 2005; McGrew, 2022; Schneider and Zakai, 2016; Wineburg, 1991a, 1991b, 1998) and the structuring and metacognitive reflection on the historical questioning process or the question to be asked (Goulding, 2021; Kaberman and Dori, 2009; McGrew, 2022; Schneider and Zakai, 2016; Wineburg, 1991a, 1991b, 1998).	<ul style="list-style-type: none"> <li>● presence (Goulding, 2021; Kaberman and Dori, 2009; McGrew, 2022; Wineburg, 1991a, 1991b, 1998)</li> <li>● frequency (Goulding, 2021; McGrew, 2022; Wineburg, 1991a, 1991b, 1998)</li> <li>● iterative-cyclical approach (Goulding, 2021; McGrew, 2022; Wineburg, 1991a, 1991b, 1998)</li> <li>● linking with historical concepts (van Boxtel and van Drie, 2004)</li> <li>● linking with historical thinking operations (Goulding, 2021; McGrew, 2022; Wineburg, 1991a, 1991b, 1998)</li> </ul>
(3) expressing the historical question	The verbal act of expressing a historical question that is aimed at linking time levels (Logtenberg, 2012; Portnoy and Rabinowitz, 2014).	<ul style="list-style-type: none"> <li>● presence (van Boxtel and van Drie, 2004; Wineburg, 1991a, 1991b, 1998)</li> <li>● frequency (van Boxtel and van Drie, 2004; Wineburg, 1991a, 1991b, 1998)</li> <li>● potential for the integration of prior knowledge (Goulding, 2021; Leinhardt and Young, 1996; McGrew, 2022; Pedrosa de Jesus et al., 2003, 2006; van Boxtel and van Drie, 2004; Wineburg, 1991a, 1991b, 1998)</li> <li>● incorporation of historical thinking operations (for example, corroboration or evaluation) (Cameron et al., 2017; Logtenberg, 2012)</li> </ul>

To gain a comprehensive understanding of the whole historical questioning process and its qualitative characterisation (see the section 'Quality characteristics for questioning processes'), operations should be considered collectively. In contrast to [Dillon \(1988, 1990\)](#) and [van der Meij \(1994\)](#), our five key factors (for example, presence and frequency of the historical operations involved, simultaneous connection with the recognition of historical concepts) suggest that their application cannot be understood as a step-by-step process, as studies show a parallelisation when operations are applied. In this respect, we can observe not only an interplay and interaction between domain-specific and non-domain-specific sub-operations and their criteria, but also a parallelised use of a wide variety of operations. For example, historians often use them simultaneously when analysing historical material ([Goulding, 2021](#); [McGrew, 2022](#); [Schobinger et al., 2023](#); [Wineburg, 1991a, 1991b, 1998](#)). More specifically, episodes of explicating perplexity may occur as part of the process of expressing a historical question, leading to new experiences of perplexity. In addition, no prototypical questioning processes or types for novices or experts could be found in the literature reviewed. It is therefore reasonable to assume they are diverse, as suggested by historians' self-reflections on their research processes ([Kraus and Kohtz, 2011](#)) and by expertise research in general ([Feltovich et al., 2018](#)).

Overall, our review highlights similarities and overlaps between theoretical concepts (see the section 'Similarities, differences and gaps between historical and psychological questioning approaches') and empirical studies of domain-specific and generic discourse on questioning (see the 'Results' section). Accordingly, our analytical framework incorporates domain-specific operations into the general questioning process. This illustrates that a questioning process becomes historical when generic aspects interact with the temporal context and/or are linked to historical operations (for example, sourcing). Furthermore, our framework, derived from a systematic literature review, provides possible criteria for the qualitative grading of operations and processes of historical questioning in future studies or practice.

## Limitations

Our review is methodologically limited by our decision to use content coding, as we had to exclude most initially identified studies and because there is no consensus on terms describing the operations and quality characteristics of (historical) questioning. Our work thus consisted of a detailed hermeneutic discussion of similarities between the studies in terms of meaning, which challenges a measurement of agreement in terms of quantity.

We chose this approach because our aim was not to give an overview of people's ability to ask historical questions. Instead, we wanted to provide a theoretical framework based on prior literature that could be useful for future research (and practical support) relating to historical questioning, by conceptualising the operations involved and their quality characteristics.

Furthermore, our search was limited to English- and German-speaking contexts and to peer-reviewed articles. It is therefore possible that historical questioning has been conceptualised differently in other language contexts or publication formats. It is also unclear to what extent the operation of recognising historical questions, considered relevant in the German-speaking theories ([Bracke et al., 2018](#); [Körber et al., 2007](#); [Nitsche and Gollin, 2020](#); [Waldis et al., 2015](#)), can be empirically conceptualised as the reviewed studies provide no information on this. Finally, the quality characteristics regarding historical questioning or its operations have not been clearly defined because this was not possible due to the state of research. Therefore, it remains a future task to operationalise these characteristics in detail.

## Practical implications

In the Introduction, we identified a gap between the theoretical importance ([Bracke et al., 2018](#); [van Drie and van Boxtel, 2008](#)) and the intentional use of historical questions in schools ([Hauschke, 2012](#); [Mehr, 2013](#)). In this section, we discuss how this gap can be addressed in the future.

On a theoretical level our review supports the assumption that historical questioning is key to historical thinking ([Körber et al., 2007](#); [Nitsche and Gollin, 2020](#); [van Boxtel and van Drie, 2018](#); [VanSledright, 2014](#)). Although [Logtenberg \(2012\)](#) and [Schobinger et al. \(2023\)](#) have partly analysed and characterised the domain-specific nature of historical questioning by using psychological theories of questioning ([Dillon, 1988, 1990](#)), our review shows in depth that combining domain-specific and

non-domain-specific studies and approaches of questioning can be fruitful to understand its operations and processes. This finding has two implications. First, some parts of history education theories could be expanded. For instance, the historical questioning dimension in constructs that conceptualise historical thinking (Körber et al., 2007; Nitsche and Gollin, 2020; Nitsche and Waldis, 2022; van Boxtel and van Drie, 2018) could augment the operations of experiencing perplexity, explicating perplexity and expressing the historical question. Second, the framework of operations and quality characteristics on historical questioning presented in Table 2 should be tested empirically. In this regard, future research can use our framework to gain further insights into the structure of historical questioning and to facilitate the development of related progression models.

Regarding the school context, our framework could be used to revise existing curricula. For example, curricula should not only require students to formulate historical questions independently but also link the asking and reflection of historical questions with the utilisation of domain-specific operations (for example, sourcing). This would provide teachers with a point of reference to select appropriate methodological and didactic approaches that consider the domain-specific and reflective elements of historical questioning. In terms of systematically teaching historical questioning, one approach could be to combine our framework with the preliminary work of Cameron et al. (2017). According to Cameron et al. (2017), higher-order questions integrate Wineburg's heuristics (for example, corroboration). This approach could be supplemented by understanding historical questioning also as a (meta-) cognitive reflection process that asks about the ambiguities on which the question is based or about the intention behind the question. This would help students to develop a more reflective approach to historical questioning. In this respect, our framework enables initial operationalisations of metacognition in dealing with history, as called for by Poitras and Lajoie (2013) and Zülsdorf-Kersting (2019). Furthermore, as historical thinking is assumed to revolve around historical questioning (van Drie and van Boxtel, 2008), it could be suggested that the state of historical thinking becomes apparent through the historical questioning process. Following the example of approaches in the natural sciences (Dori and Herscovitz, 1999; Offerdahl and Montplaisir, 2014), teachers could use historical questioning processes as an evaluation tool to assess students' level of historical thinking, for instance through student documentation of their questioning process. This would provide teachers with insight into students' historical thinking, enabling them to offer qualitative feedback on how students engage with assumptions and historical preconceptions – for example, whether they consider these and relate them to domain-specific methodologies. In sum, a more systematic focus on historical questioning in the curricula, history teaching and future research seems essential if we assume that history education aims to develop historical thinking (Körber et al., 2007; Waldis et al., 2015), that historical questions drive this process (van Drie and van Boxtel, 2008) and that history educators are responsible for facilitating students' historical thinking through appropriate support and scaffolding (Lee and Shemilt, 2003; VanSledright, 2014).

## Authors' contribution

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Not applicable to this article.

## Consent for publication statement

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The authors declare no conflicts of interest with this work. All efforts to sufficiently anonymise the authors during peer review of this article have been made. The authors declare no further conflicts with this article.

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