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Fostering Secondary Students' Historical Thinking: A Design Study in Flemish History Education

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Abstract

A recent curriculum reform in Flanders (Belgium) has introduced historical thinking as a central goal for history education. Historical thinking aims to introduce students to the methods of historians and disciplinary ways of thinking. It is a complex act, requiring the application of substantive and second-order knowledge, and is difficult to foster among students. International (intervention) research has provided several guidelines for the design of instructional practices that are effective in promoting specific aspects of students' historical thinking. However, these studies do not approach historical thinking in a holistic manner, are often vague about how general design principles were adapted to history education, and rarely report on whether the designed curricula were considered relevant and useful by teachers. Taking into account the many difficulties that teachers encounter in designing practices aimed at historical thinking, this design research aims to gain more insight into the design of instructional practices that are both effective in fostering historical thinking in a holistic manner and that are considered socially valid by teachers. The designed artifact is a 12- to 14-h lesson series on the theme "decolonization after 1945," for students in the 12th grade. It applies the model of cognitive apprenticeship's (Collins et al., 1991) general design principles to the specific context of history and approaches historical thinking in a holistic manner. The initial lesson series was evaluated and revised in two rounds based on a pilot study, an expert review and an intervention study.

Keywords Historical thinking · History education · Design-based research · Cognitive apprenticeship · Secondary education

Introduction

In Flanders (Belgium), a curriculum reform has been gradually being implemented in history education that began in 2018. This reform includes the introduction of historical thinking as a central goal for history education and is in line with a transformation that manifested itself internationally since the 1990s in which history education connects more closely to the practice of professional historians. Rather than emphasizing a single (national) narrative about the past and simply describing "what history is about", historical thinking offers an insightful and recent historiography-based approach to the past and describes "the way we go about doing history" (Lee & Ashby, 2000, p. 199).

Historical thinking combines "knowing history" and "doing history" to generate a deep historical understanding (Havekes et al., 2012). Knowing history refers to the acquisition of substantive knowledge of history and is related to the content of history, describing—in line with recent historiography—in an accurate way specific historical periods, persons, or structures, such as feudalism or the enlightenment (Lee, 2004; van Drie & van Boxtel, 2008). Doing history points to second-order and procedural knowledge that allows students to gain an understanding of how historical knowledge is constructed (Lee & Ashby, 2000; Lévesque, 2009; van Drie & van Boxtel, 2008). Second-order knowledge refers to the methods of historians (e.g., reflecting on cause and consequence, evidence, sources); procedural knowledge describes

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strategies and approaches used by historians when studying the past (e.g., how to evaluate the reliability of a source, how to establish causality) (van Drie & van Boxtel, 2008; VanSledright & Limón, 2006). Fostering historical thinking allows students to develop nuanced epistemological beliefs about history: beliefs about the nature of knowledge and processes of knowledge construction in history (Buehl & Alexander, 2001).

The rationale for introducing historical thinking as an educational goal is twofold. In the first place, it brings school history closer to academic history and is hence supposed to improve the quality of history education. Rather than teaching students a single (national) narrative, as has been the case traditionally (De Wever et al., 2011; Metzger & McArthur Harris, 2018), it introduces students to the existence of multiple narratives and interpretations and fosters nuanced thinking. Second, it allows students to be critical of uses and misuses of the past in contemporary societies, as they develop a more thorough understanding of the historical discipline.

In line with international models (Seixas & Morton, 2013; van Drie & van Boxtel, 2008; Wineburg, 2001), the Flemish history standards operationalize historical thinking into four building blocks (see Fig. 1): (1) Situating historical phenomena, sources, and representations in a broader historical frame of reference. This includes the acquisition of substantive historical knowledge. (2) Selecting and critically analyzing historical sources, including reasoning with and about sources: this includes, among others, the ability to evaluate a source's usefulness, reliability, and representativeness in light of a specific historical question. (3) Analyzing and/or formulating a substantiated answer to a historical question: this includes the ability to construct a substantiated historical representation, based on critical source analysis and on the application of typical historical modes of reasoning such as cause and consequence, historical contextualization, or multiperspectivity. (4) Critically reflecting on the complex relationship between past, present, and future: this explicitly includes the need for epistemological reflection and requires students to understand the interpretive and constructed nature of historical knowledge. Besides these four building blocks, asking historical questions is considered the starting point for historical thinking: it hence surrounds the four building blocks (Van Nieuwenhuyse, 2020).

With the introduction of the new standards, Flemish history teachers have to reconsider their practice to align with the new goal of historical thinking, which is considered a complex and unnatural act that goes against the way students spontaneously look at and engage with the past (Wineburg, 2001). Getting students to think "historically" is therefore challenging and requires well thought-out instructional materials (van Drie & van Boxtel, 2008). To facilitate the implementation of new curricula, it is essential to provide teachers with good practices aligned with them. In so doing, these practices can function as concrete examples and provide guidelines for the development of new materials (Gouëdard et al., 2020).

Fig. 1 Operationalization of historical thinking in the new Flemish history standards
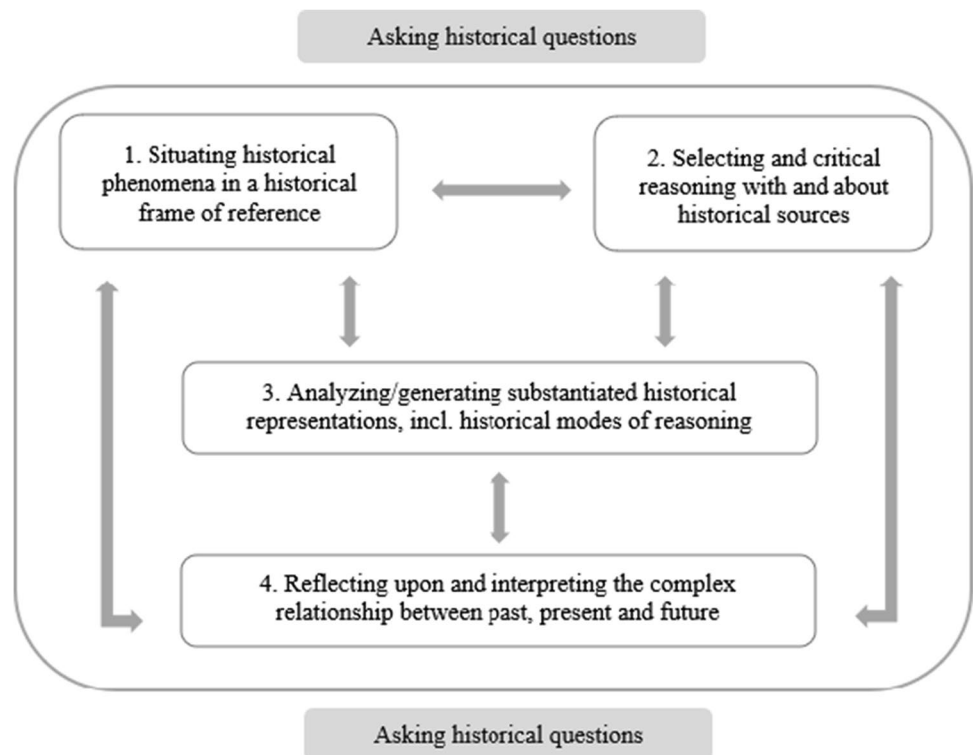
Previous (intervention) studies on fostering historical thinking among students have provided several guidelines for designing effective instructional practices, often based on principles of cognitive apprenticeship (Collins et al., 1991). They have shown that instructional practices based on cognitive apprenticeship are indeed successful in fostering aspects of students' historical thinking and therefore generate deep learning. However, it is difficult to use these interventions as blueprints for the design of new instructional materials as descriptions of lesson units in these studies are often very concise. It is not always clear how general educational design principles can be concretely adapted to a specific history education context.

Furthermore, intervention studies on fostering historical thinking often do not adopt a holistic approach but rather focus on particular aspects such as causal reasoning (Stoel et al., 2015), historical contextualization and perspective-taking (Huijgen et al., 2018), critical source analysis (Nokes et al., 2007; Reisman, 2012), or historical writing (De La Paz, 2005; De La Paz & Felton, 2010; van Drie et al., 2015). Because of the strong focus on specific aspects of doing history, these studies pay little attention to knowing history. It is often unclear to what extent the (content of the) instructional practices adopted in the intervention studies connect to recent historiography, even though this is an important part of historical thinking. As a result, these studies have generated few guidelines on how to integrate multiple aspects of historical thinking, encompassing both knowing and doing history.

A final difficulty concerns the position of the teacher. Reports of intervention studies usually limit themselves to measuring the effects on students. There is often little information about how teachers perceived the materials. Yet, in order for interventions to have an applied value, it is important that they have social validity, i.e., that they are considered acceptable, relevant, and useful by the actors involved (Kazdin, 2005). This is particularly important given that research has repeatedly shown that historical thinking finds its way only sparingly into educational practice (e.g., Hicks et al., 2004; Van Nieuwenhuyse et al., 2015; VanSledright & Limón, 2006; Voet & De Wever, 2016). This points to a gap between theoretical guidelines for the design of instructional practices aiming to foster historical thinking and their practical application.

The Design Study

Based on the challenges outlined above, this research aims at gaining more insight into the design of instructional practices that are both effective in fostering historical thinking and are considered socially valid by teachers. A design-based research process was deemed particularly appropriate as it allowed for a close collaboration with teachers while

considering evidence-based recommendations regarding the promotion of students' historical thinking. This allows for the development of a maturing intervention that is directly relevant for practice and contributes to a better theoretical understanding of the effectiveness of the applied design principles, hence meeting both the practical and theoretical goals of design-based research (McKenney & Reeves, 2019).

The design team was composed of a professor in educational sciences, a history professor who specialized in history didactics and a PhD candidate in the same discipline. The research was part of a broader project to examine teachers' beliefs and practices regarding historical thinking and to examine the relationship between historical thinking and democratic citizenship. In particular, the research project examined whether fostering students' historical inquiry competences, as part of historical thinking, allows students to engage differently with contemporary sources and societal debates on public issues. This paper reports on the design process of the lesson series that was developed in this context.

Overview of the Design Process

The design process was iterative throughout which educational practitioners and other experts were actively involved. It followed a set protocol as suggested by McKenney and Reeves (2019) beginning with an analysis and exploration and then followed by two cycles of formative design and evaluation/assessment and one final design phase (McKenney & Reeves, 2019).

The analysis and exploration phase investigated difficulties and solutions regarding the design and implementation of instructional practices to foster historical thinking, based on a review of research literature and a qualitative study on teachers' beliefs and instructional practices. The first design and construction phase resulted in an initial version of the lesson series, based on principles derived from the model of cognitive apprenticeship (Collins et al., 1991). This version was evaluated and assessed via a pilot study and an expert review with history and (history) educational scholars as well as experienced teachers. The evaluation resulted in a second design review in which the initial lesson series was adjusted. Due to the COVID-19 pandemic, an additional construction phase was needed to modify the lesson series for remote education. The revised lesson series was evaluated and assessed via an intervention study in which we collected data from students (via pre- and posttests) and teachers (logbooks and interviews). This resulted in a third design phase that finalized the lesson series. An overview of the design process is depicted in Fig. 2. In the section that follows, the research context is described, after which each step in the design process is discussed in detail.

Fig. 2 Overview of the design process

Analysis and exploration	Exploration of needs and solutions - Research literature - Qualitative study
First design and construction phase	Development of the initial lesson series - Design principles - Initial lesson series - Teacher and student materials
First evaluation and reflection phase	Evaluating the initial lesson series - Expert review - Pilot study
Second design and construction phase	Revision and digitization of the lesson series - Revised teacher and student materials - Scenario for digitized lesson series
Second evaluation and reflection phase	Intervention study - Pre- and posttests with students - Interviews and online questionnaire with teachers
Third design and construction phase	Finalization of the lesson series

Note. Research phases based on McKenney and Reeves, 2019.

Research Context

This design study was conducted in Flanders (Belgium), where history education takes up 2 h a week as part of general education. The new history standards are centered around historical thinking, which is conceptualized as a combination of knowing and doing history and operationalized in four building blocks as noted previously in the introduction. In terms of historical content, the standards only prescribe which historical periods should be addressed at which stage of secondary education and do not impose concrete factual knowledge.

Teachers in the last stage of secondary history education are required to have a master's degree in history and a teaching degree. In the last decade, significant changes have occurred in the teacher training courses, in particular regarding their attention to historical thinking on a theoretical and practical level. Considering the absence of mandatory teacher professionalization, the curricular freedom for history teachers, and the absence of standardized testing, not all teachers have necessarily become acquainted with historical thinking in the same manner, and hence, current teaching practices regarding historical thinking vary strongly. Overall, instructional practices by Flemish history teachers are characterized by an emphasis on knowing history rather than doing history (Van Nieuwenhuyse et al., 2017; Voet & De Wever, 2016). For instance, although literature recommends organizing historical inquiries based on a critical analysis of multiple historical documents to foster students' historical thinking, most Flemish history teachers are not inclined to organize these in their practice (Voet & De Wever, 2016). For the majority of Flemish history teachers, these new history standards hence require a significant reconsideration of their instructional practice, providing an ideal context for this study.

Exploration of Needs and Solutions

Difficulties Regarding (the Teaching of) Historical Thinking

The first step in our design process was to examine teachers' beliefs and instructional practices with regard to historical thinking as well as general issues related to students' historical thinking ability. For instance, we aimed to examine to what extent teachers include knowing and doing history in their practice: do they focus only on the content of history (i.e. knowing history) or do they also include second-order and procedural knowledge, hence introducing students into the practice of history (i.e. doing history)? Regarding doing history, we aimed in particular to gain insight into how teachers' practices precisely presented the practice of historians to students and to what extent their practices fostered a thorough understanding of the methods of historians among students. This exploration was done via a literature review and followed by a qualitative study that included 21 Flemish history teachers that was based on two semi-structured interviews and an analysis of their instructional practices (Wilke & Depaepe, 2019; Wilke et al., 2022a). This allowed us to identify concrete difficulties regarding the way that teachers addressed historical thinking in their practice in the Flemish context and to examine to what extent they aligned with international findings.

The literature review revealed several issues with regard to teachers' historical thinking practices. Overall, it showed that these practices often remain focused predominantly on knowing history (Barton & Levstik, 2004; Van Nieuwenhuyse et al., 2015; VanSledright & Limón, 2006). This means that teachers' practices are mostly aimed at expanding students' substantive knowledge about what happened in the past (i.e., knowing history) and less so on introducing them to the practice of historians (i.e., doing history). When doing history is addressed, this is rarely done in-depth. This becomes particularly evident with regard to source work. Critical source analysis requires students to go beyond the mere content of a source, and to evaluate the source's value (usability, reliability, representativeness) in light of a historical question, thereby taking into account aspects such as the author's positionality and goal(s) (Van Nieuwenhuyse, 2020). However, researchers have established that teachers use sources mainly in a content-related manner: as illustration or merely as carriers of substantive knowledge rather than subject them to a critical analysis (e.g. Hicks et al., 2004; Nokes, 2010; Van Nieuwenhuyse et al., 2015).

Literature that covers students' historical thinking ability shows that such practices, which only use sources in an illustrative way, or as carriers of information, may hinder the development of nuanced epistemological beliefs among students. As students are not (or only superficially) challenged to critically evaluate sources, their naïve perceptions that historical knowledge can simply be derived from sources in a straightforward way are being confirmed instead of questioned (Wilke et al., 2022a). Such naïve epistemological beliefs also hinder the application of typical historical modes of reasoning (e.g., Huijgen et al., 2014; van Drie et al., 2013), as students do not understand that historical knowledge is interpretive and constructed, yet tend to consider historical knowledge to be either fixed and singular, or completely subjective (Maggioni et al., 2009; Stoel et al., 2017b).

In explaining why these difficulties occur, studies point to the importance of teachers' educational beliefs and contextual factors. Teachers sometimes question their students' ability to engage in interpretive history (Van Hover & Yeager, 2003; Wansink et al., 2016) and tend to focus primarily on knowing history (Barton & Levstik, 2004; Van Hover & Yeager, 2003). Contextual factors, such as time and available resources (Voet & De Wever, 2016), and the presence of standardized tests were also identified as hindering factors (Hicks et al., 2004; VanSledright & Limón, 2006).

Our own qualitative study confirmed these findings and also generated additional points of interest. Teachers reported uncertainty about how to evaluate doing history as well as concerns about the difficulty of historical thinking for their students, in particular with regard to building block 3 "generating historical representations" (Wilke & Depaepe, 2019). This study also provided possible explanations for these perceived difficulties. First, most teachers only had a limited and one-sided understanding of what historical thinking is. Second, teachers often made a strict distinction between knowing and doing history. This dichotomy goes against literature which stresses the interconnectedness and concurrent nature of knowing and doing history (Lee, 2005; VanSledright & Limón, 2006). Third, several teachers believed that addressing doing history is only possible via student-centered activities, such as inquiry-based tasks, which went against (some) teachers' preference for teacher-guided instructional practices (Wilke & Depaepe, 2019). These (mis)conceptions concerning the teaching and learning of historical thinking fueled teachers' hesitancy to address doing history in their practice.

The needs analysis allowed us to identify areas in which teachers need additional support and which have to be addressed when designing lesson materials so that they can be considered socially valid (e.g., providing examples on how to integrate knowing and doing history, the need to model good practices, supporting evaluation). The investigation also confirmed the need for lesson materials that foster students' historical thinking in a profound and holistic

manner. The next step in the design process was to generate a set of design principles for the construction of such materials.

Instructional Design Principles to Foster Historical Thinking

To establish design principles, a review of the literature study was conducted to examine both literature from general educational psychology and history educational literature.

Considering the complexity of historical thinking that required a combination of substantive, second-order and procedural knowledge, the model of cognitive apprenticeship (Brown et al., 1989; Collins et al., 1991) seemed an appropriate framework for designing practices to foster historical thinking. This model is directed at the acquisition of complex skills "through processes of observation and guided practice" (Collins et al., 1991, p. 13) and centers around the use of authentic tasks.

In terms of teaching methods, it puts forward the principles of modeling, coaching, and scaffolding to help students acquire these skills. In the modeling phase, the teacher or subject matter expert demonstrates the discipline-specific tasks and provides explicit instruction on the application of conceptual and procedural knowledge. Subsequently, students practice the application of these skills supported by scaffolds and coaching by the teacher. By fading out the scaffolds, students gradually gain more independence in the application of the intended skills. Articulation and reflection support students in communicating their knowledge and reasoning processes and comparing them to others. Finally, students are encouraged through exploration to apply their acquired skills to new (including their own) problems and settings.

Literature in history education supports the adequacy of principles from cognitive apprenticeship to promote students' historical thinking (van Boxtel & van Drie, 2018) and provides more concrete guidelines for applying the model's general principles to the specific context of history.

For history, inquiry-based (writing) tasks are considered authentic tasks if they connect to the practice of historians (van Boxtel & van Drie, 2018). These tasks allow students to develop their own substantiated historical representations in response to an authentic historical question. Students are required to investigate the historical question via a critical analysis of multiple sources (van Boxtel et al., 2021; Voet & Wever, 2017). This representation then needs to be substantiated by providing arguments and evidence and engaging with counterarguments (Monte-Sano et al., 2014; van Boxtel et al., 2021). In particular, evaluative research questions are recommended for inquiry activities as these are more effective in eliciting historical thinking (van Drie et al., 2006). These inquiry-based activities connect closely to the history

discipline and to various aspects of historical thinking. They therefore not only address historical thinking in a holistic manner, but also are expected to be able to contribute to the development of nuanced epistemological beliefs about history (van Boxtel et al., 2021).

Several studies have successfully demonstrated the need to rely on principles of modeling, coaching, and scaffolding to enhance aspects of students' historical thinking (see the "Introduction" section). They emphasize at the same time the importance of explicit teaching. This should be directed at second-order and procedural knowledge and should not be limited to the modeling phase but embedded throughout the instructional practice (Reisman, 2012; Stoel et al., 2017a). Moreover, these studies demonstrate that explicit teaching on discipline-specific, rather than general strategies, yielded better results (Reisman, 2012; van Drie et al., 2015). In terms of scaffolding, graphical organizers, such as an argumentative diagram, are recommended to support students' reasoning processes (Stoel et al., 2017a; van Drie et al., 2005), and research suggests that scaffolds for historical writing should contain prompts specifically directed at critical source analysis (Monte-Sano & De La Paz, 2012). These studies also provide concrete examples of scaffolds supporting various aspects of historical thinking, such as argumentative history writing, source corroboration, and critical source analysis (e.g. University of Michigan, 2021; Monte-Sano et al., 2014). Concrete examples were also found in materials which could be used for coaching students by providing feedback, particularly through the use of discipline-specific rubrics (e.g. Monte-Sano, 2012; Monte-Sano et al., 2014; Monte-Sano & De La Paz, 2012; Stoel et al., 2017a).

To support articulation and reflection, the literature points to peer-to-peer interaction and group work that allows students to articulate their reasoning processes (e.g. Stoel et al., 2015; Stoel et al., 2017a). However, the importance of whole-class discussions led by the teachers are also emphasized as these provide opportunities for further articulation, teacher feedback, and reflection on students' learning (Reisman, 2012; Stoel van Drie et al., 2017a; van Boxtel et al., 2021; van Drie & van de Ven, 2017).

Regarding the integration of knowing and doing history, discipline-specific literature emphasizes the importance of both aspects as part of students' historical thinking (Lee, 2005; van Boxtel & van Drie, 2017). Yet, we found no concrete guidelines on how to adequately integrate both in an instructional practice nor on how to make sure the lesson series corresponds to recent historiographical shifts and insights. Research on the relationship between academic and school knowledge, however, has argued that fundamental changes occur when academic knowledge is transferred to a school context, in the sense that a substantiated scientific historical representation becomes distorted, creating a

disconnect between both (Popkewitz, 2004). Within history education, such a disconnect has, for instance, been analyzed for representations of the colonial past (Bentrovato & Van Nieuwenhuyse, 2020). This clearly points at the necessity that lesson materials intended to foster historical thinking will have to align with recent historiographical insights.

Development of the Initial Lesson Series (1st Design and Construction Phase)

Design Principles

Based on the results of the needs analysis and exploration, we outlined a number of design principles that would be implemented in a lesson series. Because we aimed to foster historical thinking in a holistic and in-depth manner (focusing on knowing and doing history and covering all four building blocks of historical thinking), the lesson series was directed at students in the 12th grade (hence, towards the end) of secondary education.

In line with recommendations from the literature discussed in the previous section, the following design principles have been distinguished. First, we ensured a close adherence to current historiography by consulting academic literature and an expert professional historian and by including historiographical debates in the lesson series. These historiographical debates also facilitated an integration of knowing and doing history as they provided challenging questions, functioning as a starting point for inquiry tasks, which constituted the second design principle. These inquiry tasks were used as authentic, discipline-specific tasks in which students constructed a substantiated historical representation. They were connected to authentic historiographical debates and were designed around historical sources that reflected the various perspectives within those debates. Third, the lesson series drew on the principles of modeling, coaching (incl. feedback), and scaffolding to support students in constructing these substantiated historical representation. To support teachers in providing scaffolding, coaching, and feedback to their students, scaffolding tools were designed as well as a rubric to evaluate students' ability to construct a substantiated historical representation. Fourth, the lesson series included explicit teaching on second-order and procedural knowledge. Fifth, articulation and reflection were facilitated via group work, alternated with whole-class discussions and with shorter, teacher-guided tasks which provided opportunities for additional teacher feedback. The decision to include whole-class discussions and teacher-guided tasks was in line with research literature and was also prompted by a concern not to reinforce teachers' preconception that doing history is only possible via time-consuming, student-centered activities.

The Initial Lesson Series

Based on the design principles presented above, a first version of the lesson series was constructed. The lesson series was developed around the theme of "decolonization after 1945" and included eight lessons, taking up 12 to 14 history classes. Historical thinking was addressed in a holistic way by addressing both knowing and doing history and covering all four building blocks of historical thinking, in line with the new Flemish history standards. To this end, each lesson had a primary focus on either substantive knowledge (knowing history) or second-order and procedural knowledge (doing history). Both aspects, however, were closely interconnected. The lessons with a focus on knowing history provided students with substantive knowledge which they had to apply in the lessons with a focus on doing history. They also included explicit teaching on second-order knowledge and short exercises on aspects of doing history. For instance, lesson 4 centered around the question to what extent the Balfour declaration of 1917 was at the root of the Israeli-Palestinian conflict. This lesson was focused mainly on acquiring substantive knowledge about the origins and characteristics of the conflict. However, students simultaneously compared Israelian and Palestinian narratives on the role of the Balfour declaration which provided opportunities for explicit teaching on the notion of causality (as a historical mode of reasoning), multiperspectivity, and the pitfalls of presentism, and hindsight. Students had to apply this newly acquired knowledge of causality and multiperspectivity in the inquiry tasks in lesson 5. These lessons thus provided impulses to further students' procedural and second-order knowledge. The lessons with a focus on doing history also provided opportunities to foster substantive knowledge. For instance, the second lesson was directed at doing history and centered around an inquiry task in which students had to provide a substantiated answer to the question who was most responsible for the political decolonization of Belgian Congo. While analyzing the sources, students gained insight into Belgian and Congolese views on independence, important agents in the process towards independence and acquired more in-depth knowledge about the process of decolonization. An overview of the lesson series is presented in Table 1.

The design principles outlined above were applied in the following ways.

A close adherence to current insights from historical research was ensured via an exploration of recent historiographical literature on decolonization (such as from the historiographical school of new imperial histories). Each lesson was designed around a historical question, connected to an authentic historiographical and/or (historical) societal debate. Lesson 2, for instance, centered around the question who was most responsible for the decolonization

Table 1 Overview of the lesson series

Nr.	Duration	Lesson topic and central historical question	Student and teacher activities	Primary focus	Historical thinking building blocks
1	2 x 50'	Causes and process of decolonization Historical question: Who was most responsible for the decolonization of British-India?	Teachers model the process of generating a substantiated historical representation via historical inquiry. Teachers provide explicit teaching on multiperspectivity and on evaluating sources' usability, reliability, source corroboration and on how to substantiate a historical claim (argumentation and evidence).	Doing history	1, 2, 3
2	2 x 50'	Decolonization of Belgian-Congo Historical question: Who was most responsible for the decolonization of Belgian-Congo?	Students work in groups on a historical inquiry task, supported by scaffolds. Teachers coach students and provide explicit teaching on the concept of the representativeness of sources. Teachers provide feedback and lead class-discussion on the inquiry task.	Doing history	1, 2, 3
3	1 x 50'	Belgian collective memory of the colonial past Historical question: How did the representation of the colonial period evolve over the period 1945-present in Belgian-Flemish history textbooks and what role did the changing context play in this regard?	Students evaluate sources' usability, reliability and representativeness. Teachers provide explicit teaching on different layers of multiperspectivity (in the past, in the present, over time) and on the constructed and interpretive nature of historical knowledge	Knowing history	2, 3, 4
4	2-3 x 50'	The Israeli-Palestinian conflict Historical question: To what extent was the Balfour declaration of 1917 at the root of the Israeli-Palestinian conflict?	Students study and compare multiple perspectives, they evaluate sources' reliability. Students practice formulating a substantiated historical claim, based on evidence. Teachers lead whole class-discussion related to students' activities on evaluating sources and formulating a substantiated historical claim. They provide explicit teaching on presentism and on causality as a historical mode of reasoning, connected to the constructed and interpretive nature of historical knowledge.	Knowing history	1, 2, 3, 4
5	2-3 x 50'	Parallel case-study of the Rwandan genocide or the India partition Historical question: To what extent could the negative consequences (being the outbreak of genocide) of the withdrawal of UN troops from Rwanda in 1994 have been foreseen by the actors involved? Historical question: To what extent could the British and Indian leaders involved foresee the negative consequences of the rapid British withdrawal and partition of British India in 1947?	Students work in groups on one of the historical inquiry task, supported by scaffolds. Teachers coach students during the inquiry task and provide feedback on the final products.	Doing history	1, 2, 3, 4
6	1 x 50'	Postcolonial relations between the West and former coloniesHistorical question: To what extent did the independence of the former colonies after 1945 constitute a radical break in their relationship with the West?	Students evaluate the usability and reliability of sources and substantiate a historical claim. Teachers provide explicit teaching on continuity and change as a historical mode of reasoning.	Knowing history	1, 2, 3
7	1 x 50'	Migration after 1945 Historical question: How did migratory patterns to (Western)-Europe evolve in the period 1945–2000s?	Students evaluate the reliability of sources.	Knowing history	1, 3
8	1 x 50'	Migration and integration Historical question: What was the main cause of integration problems experienced by immigrants in Belgium in the 1970s–1990s?	Students work individually and in groups to evaluate two competing historical representations, based on sources. Teachers coach students and lead class-discussion on the inquiry task.	Doing history	1, 2, 3

Note: Table adapted from Wilke et al. (2022b)

of Belgian-Congo. In this lesson, the traditional narrative of independence being granted by the colonizers was questioned: students studied sources demonstrating both Belgian and Congolese agency. In lesson 3, evolving historical representations of the colonial past were examined, connecting to the notion of collective memory and societal debates about the colonial past.

Authentic historiographical debates provided the basis for the inquiry tasks that were used in four of the lessons. These tasks centered around an evaluative question connected to a historiographical debate (see Table 1 for an overview of the historical questions), such as "To what extent could the British and Indian leaders involved foresee the negative consequences of the rapid British withdrawal and partition of British India in 1947?". A number of historical sources were provided representing different answers to the historical question and reflecting different perspectives within that historiographical debate. Students had to compare and critically evaluate the value of these sources to generate an answer to the historical question. They then had to substantiate their claim with arguments and evidence and engage with counterarguments.

In lesson 1, teachers modeled the inquiry task, demonstrating the various steps in providing a substantiated answer to a historical question based on critical source analysis. In subsequent inquiry tasks, teachers provided scaffolds and coaching to the students. Scaffolds were provided for the evaluation and corroboration of sources, the weighing of evidence, and the writing of a substantiated answer (modeled after University of Michigan, 2021 and Monte-Sano et al., 2014). They were designed to fade out during the lesson series. For instance regarding the evaluation and corroboration of sources, the initial scaffold used in lesson 2 provided prompts for each step in the source analysis for each of the sources (e.g., questions regarding various aspects of a source's reliability: the author's positionality, the goal and audience of the source, the societal context, etc.). Subsequent scaffolds that were used in lesson 5 only reminded students to assess the sources' reliability (see Fig. 3). Similarly, initial scaffolds for providing a substantiated answer provided a writing scheme, whereas scaffolds used in the lesson series only provided exemplary sentences on which students could rely.

Teachers coached students during the lesson series and other activities by providing an appropriate level of scaffolding and also by providing feedback on students' inquiry tasks. To this end, an evaluation rubric was designed. The initial rubric was adapted from Monte-Sano (2012), Monte-Sano and De La Paz (2012), and Monte-Sano et al. (2014). It included five criteria on a four level scale: (1) position statement; (2) argumentation based on sources as evidence; (3) evaluating a source's reliability; (4) evaluating a source's representativeness; and (5) engaging with counter arguments. Table 2 provides an overview of the four different

competency levels for the initial criterion "argumentation based on sources as evidence."

Explicit instructions were provided on the application of substantive, second-order, and procedural knowledge (e.g., reliability and how to assess it, representativeness, source corroboration). In the first lesson, for instance, the teacher provided explicit teaching on the second-order concepts of reliability and source corroboration and on procedural knowledge related to critically assessing sources and providing a substantiated answer to a historical question. In lesson 2, explicit teaching on the notion of representativeness was added. In lesson 3, explicit teaching on these notions was repeated during a teacher-guided exercise on source analysis. Explicit teaching was mainly directed at second-order and procedural knowledge related to the processes of constructing a substantiated historical representation and applying historical modes of reasoning (e.g., causality in lesson 4). On two occasions (lessons 3 and 4), this was also used explicitly to teach students about the interpretive and constructed nature of historical knowledge.

To facilitate articulation and reflection, students worked in groups on the inquiry tasks. Whole-class discussions were used to discuss students' findings afterwards and to allow teachers to provide feedback and ask questions to advance students' historical thinking. For instance, in lesson 2, students' inquiry tasks were discussed in class, and this was used as an opportunity to revise second-order and procedural knowledge addressed in lesson 1.

Exploration was not included in the lesson series as this requires a high level of autonomy which would not be feasible to obtain within the time span of 12 to 14 history lessons, but would rather be achieved over the course of an entire year of history lessons.

Teacher and Student Materials

To support teachers in implementing the lesson series, the first construction phase included teacher and student materials. A document for teachers was developed providing an explanation of the various building blocks of historical thinking in the Flemish history standards and detailing the structure and goal of the lesson series as well as the design principles. A lesson plan was provided for each lesson following a four part structure: first, an indication of which aspects (building blocks) of historical thinking were addressed; second, an explanation of the lesson's main objectives and learning goals both with regard to knowing history and doing history, so as to demonstrate the interconnectedness between both. Third, an explanation of the pedagogical approach(es), including a description of teachers' and students' activities and a connection to the main design principles. Fourth, a detailed step-by-step script, divided in

Fig. 3 Scaffolds for source analysis in lesson 2 (top) and lesson 5 (bottom).

SOURCE 4: MEMOIRES OF GASTON EYSKENS (PUBLISHED IN 1993)	
RELIABILITY	
Consider the following information	
Who was the **author**? What function/position did the author hold? What was their social background, occupation, worldview, beliefs?	Gaston Eyskens was the Belgian prime minister at the time of Congo's independence. He was a member of the Catholic Party.
For what **purpose** did the author create this resource? Who was the author's target **audience**?	The excerpt stems from a memoire, a specific genre in which authors seek to present and preserve their personal views of events. In doing so, authors often portray themselves in a positive light and attempt to justify their own actions and role in the events. In this way, they can counter any criticism from opponents. Memoires are intended to be read by a wide audience.
When and **where** was this source created?	The mémoires were published in 1993, several decades after Congo's independence and after Eyskens' death.
In what **societal context** was the source created?	At the time at which the source was created (1990s) societal views on the colonial past had shifted strongly. There was a much more critical view of the colonial past, compared to the 1960s.
What **information** does the author rely on?	The author draws on his own memories and notes from the period when he was prime minister. He was an eyewitness to these events and closely involved in the events. The mémoires were published several decades after the events: the author therefore already knew how the situation would develop. This may have influenced the way he described the events.
What does this information tell you about the value of this source?	

SOURCE	USABILITY *What does this source tell you about the consequences of the decision? What arguments does the source use?*	RELIABILITY *How reliable is this source to answer the research question? Consider the following elements: author, goal and audience, time and place, societal context, information*	PERSPECTIVE AND REPRESENTATIVENESS *What perspective does the source reflect? To what extent is the perspective in this source broadly shared? Does the source represent a larger group?*	CRITICAL SOURCE CORROBORATION *Are there other sources that support or refute this source's position?*
Source 1: Nehru				
Source 2: Jinnah				
Source 3: Mountbatten				
Source 4: Wolpert				

lesson phases with a proposed timing, instructions for students, sources, guiding questions for the sources, and model answers. For each lesson, furthermore, a PowerPoint presentation was created. The evaluation rubric was also included in the teacher materials.

For students, a sourcebook was designed including the sources being discussed in the lesson series, along with the various scaffolds. In this first construction phase, no additional student materials were created as we expected students to be able to take notes by themselves.

Table 2 Competency levels for argumentation based on sources as evidence

1	2	3	4
The claim is not supported by evidence from sources	The claim is supported by evidence from sources, but the evidence is often irrelevant or inaccurate It is unclear to which source(s) the students refers	The claim is supported by evidence from sources in a limited way Selected sources and excerpts from sources are usually accurate and relevant to the claim In most cases, it is clear which source(s) the student refers to	The claim is supported by evidence from sources Selected sources and excerpts from sources are accurate and relevant to the claim It is clear which source(s) the student refers to

Evaluation of the Initial Lesson Series (1st Evaluation and Reflection Phase)

Expert Review

To evaluate the initial lesson series' connection to current historiographical insights, its adherence to the predetermined design principles, and its feasibility and usability, an expert review panel was set up consisting of three types of experts: a historian, (history) educational scholars and experienced history teachers and history teacher trainers.

In terms of the lesson series' adherence to recent historiography, the historian generally agreed with the proposed content of the lesson series and provided suggestions for additional (very recent) historiographical literature and source material that could be integrated in the lesson series, for instance, regarding the lesson on British-India (lesson 1 and 5) and societal debates on migration and integration in Belgian society (lesson 8).

The (history) educational scholars, experienced history teachers, and teacher trainers confirmed that the initial lesson series adequately applied the proposed design principles. Although the design principles in themselves were considered valuable, two concerns were raised about how they were implemented in the materials, in particular in light of the material's feasibility and usability. First is regarding the lesson series' use of inquiry tasks. A need was expressed to provide more support for explicit teaching, modeling, and coaching on these tasks. In particular, the experts pointed to (variation between) teachers' own second-order and procedural knowledge, for instance, regarding (how to assess) reliability as this was not always included in teachers' initial training. The experts, therefore, suggested that some teachers may need more support to take up their role as experts during modeling, coaching, and explicit teaching.

Second, the experts deemed the lessons to be quite challenging for students, among others, because of the absence of worksheets or a textbook, the extensive reliance on (textual) sources, and the use of inquiry tasks. Although they did not oppose the use of inquiry tasks, they did caution that, as students are mainly accustomed to teacher-directed history classes, this would constitute a new and challenging way of engaging with history. They therefore proposed to elaborate the supporting materials, in line with the explicit teaching done by the teacher on second-order and procedural knowledge, to provide more guidance during the lesson series and to accommodate differences in students' familiarity with historical thinking.

Pilot Study

A pilot study was created to examine the applicability of the evaluation rubric. Two classes in the 12th grade (36 students in total) completed an inquiry task, after which students' answers were evaluated by the design team using the initial evaluation rubric. The pilot test confirmed that a rubric was a suitable way of evaluating students' inquiry tasks. However, it became clear that the rubric was quite difficult to use, that the evaluation criteria were not clearly delineated, and that more clarity was needed in the descriptions of the various proficiency levels.

Revision and Digitization of the Lesson Series (2nd Design and Construction Phase)

Revision of the Lesson Series

Based on an evaluation of the lesson materials via the expert review and pilot study, the initial lesson series was adjusted. Table 3 provides an overview of the main issues identified in the initial lesson series and the changes that were made to the lesson series to accommodate them.

Revision of Teacher and Student Materials

Considering that there were no main issues regarding the lesson series' connection to historiography, the revision of teacher and student materials mainly focused on the difficulties identified by the (history) educational scholars and experienced history teachers. In the lesson plans for teachers, additional clarification was provided concerning the second-order and procedural knowledge which required explicit teaching from teachers. Explanatory texts were

Table 3 Revision of the lesson series after the first evaluation phase

Issues identified in expert review	Adaptation in second design phase
- Differences in teachers' expertise regarding historical thinking - Difficulty level for students - Insufficient supporting materials for teachers and students - Reliance on textual sources	Teacher materials - Explanatory texts on second-order and procedural knowledge - Suggestions for coaching students - Additional scaffolds for students Student materials - Development of a learning text - Development of worksheets - Development of additional scaffolds - Addition of visual sources
Issues identified in the pilot study of the evaluation rubric	Adaptation in second design phase
- Criteria not clearly delineated - Ambiguity in descriptions of proficiency levels - Complex to use	- Merging and addition of criteria - Revision of descriptors - Development of a user guide with exemplary essays

added, directed at teachers so as to provide them with further knowledge about the precise meaning of these concepts and procedures (see Fig. 4 for an example). This way, we aimed to bolster teachers' confidence and knowledge regarding the teaching of historical thinking and intercept possible differences between them. Furthermore, we provided concrete suggestions for how to coach students (and allow for differentiation), for instance, by providing guiding questions that teachers could use to give students additional support (see Fig. 5) and by developing additional scaffolds in the student materials (see further).

Adjustments in student materials were made to provide students with step-by-step guidance during the lesson series. To support them in taking notes, worksheets were developed based on the Cornell note-taking method (Cornell University, n.d., based on: Pauk & Owens, 2010) dividing worksheets in a left-column with keywords that followed the structure of the lesson and a right column for note taking. At the bottom, students could make a short summary or

reflection of the lesson. A learning text was created, summarizing the content of each lesson. This functioned as a reference work that students could consult besides their own notes. For the development of this text, we looked for guiding principles supporting to increase text comprehension in history. Based on the work of Land et al. (2009), we aimed for this learning text to be coherent, include transition words (e.g., because, however, besides), and be written in a factual and professional style.

Besides the development of worksheets and a learning text, additional scaffolds were added to students' materials which took the form of visual organizers and summarizing documents for second-order and procedural knowledge, in line with explicit teaching by the teachers. For instance, a summarizing document was made regarding "reliability of sources" (Fig. 6) as well as a visual organizer depicting the process of answering a historical question based on sources (Fig. 7). These materials mirrored the explicit teaching provided by the teacher. To balance out the strong reliance on

Fig. 4 Example of an explanatory text on source corroboration in the lesson script

SOURCE CORROBORATION

During source corroboration, multiple sources that contain information regarding a particular historical question are compared to each other. The information in source can complement each other, when sources provide additional information on a topic, or can confirm each other, when several sources contain the same information.

When confronting sources, sources may also contradict each other. This is the case when the information in the sources does not match. This may be because the source is written from a different perspective (multiperspectivity), but may also indicate that the information in one of the sources is less reliable.

Source confrontation is essential to provide a nuanced and substantiated answer to a historical question.

Fig. 5 Example of suggestions for coaching during the inquiry task in lesson 2

Do you want students to work independently, but want to offer additional support in analyzing the sources? If so, you can use the supporting questions in the appendix. These questions can help students to evaluate the usefulness and reliability of the source step-by-step and to corroborate the sources. In this way, these questions offer an additional level of support to the tables that students will find in materials.

SUPPORTING QUESTIONS

Source 1: Van Bilsen (1992)

- What information does this source give you to answer the historical question who was most responsible for the independence of the Belgian Congo?
    - Does the source contain elements that indicate that the Belgians took the initiative?
    - Does the source contain elements that indicate that the Belgians did not take the initiative, or tried to slow down the process towards independence?
- Read the information given about the author. Do these elements contribute to the reliability of the information in the source, or not?
- In this source, Van Bilsen looks back at the publication of his thirty-year plan. He does so several decades later, in 1992.
    - How does Van Bilsen outline his own role in Congo's independence?
    - How was the colonial past viewed in the 1990s (positively, negatively, nostalgically,...)? Did this view differ from that in the 1950s, or not? How might that have played a role in the way Van Bilsen looks back at the publication of his thirty-year plan?
    - What does Van Bilsen know about the decolonization process in 1992 that he did not know when he wrote his thirty-year plan? How might that have influenced his views?
- Were Van Bilsen's views on the future of the Belgian Congo widely shared in the Belgian society at the time of the publication of his thirty-year plan?
    - What does source 4 tell you about this?

textual sources, additional visual support was provided via the use of visual sources, illustrations, and videos, both in the PowerPoint and student materials.

Revision of the Evaluation Rubric

To overcome the issues with the evaluation rubric identified in the pilot study, the rubric's criteria and descriptors of proficiency levels were revised. The criterion "argumentation based on sources as evidence" was broken down into three criteria: argumentation (structure-oriented: number of arguments, whether they were used explicitly or implicitly); quality of the argumentation (content-oriented); and use of sources as evidence (see Table 4 for the revised competency levels). The criteria "evaluating a source's reliability" and "evaluating a source's representativeness" were merged into one criterion "evaluating the sources' value." To support teachers in applying the rubric, a guide was developed explaining the various criteria and providing examples of evaluated student essays. A simplified version of the rubric was also developed for use as a (peer-)feedback instrument by teachers or students.

Digitization of the Lesson Series

The COVID-19 pandemic prompted an additional construction phase. The corona measures in Flemish education only allowed for half of the lessons to take place in school; the other half needed to be organized via (synchronous) online education or via (asynchronous) digital modules. As schools could individually choose for a synchronous or asynchronous policy, and as they use a variety of educational learning platforms, it was not possible to design a completely developed turn key digitized version of the lesson series. Rather, we designed a model that included a range of materials for remote education that could be used easily and flexibly by teachers.
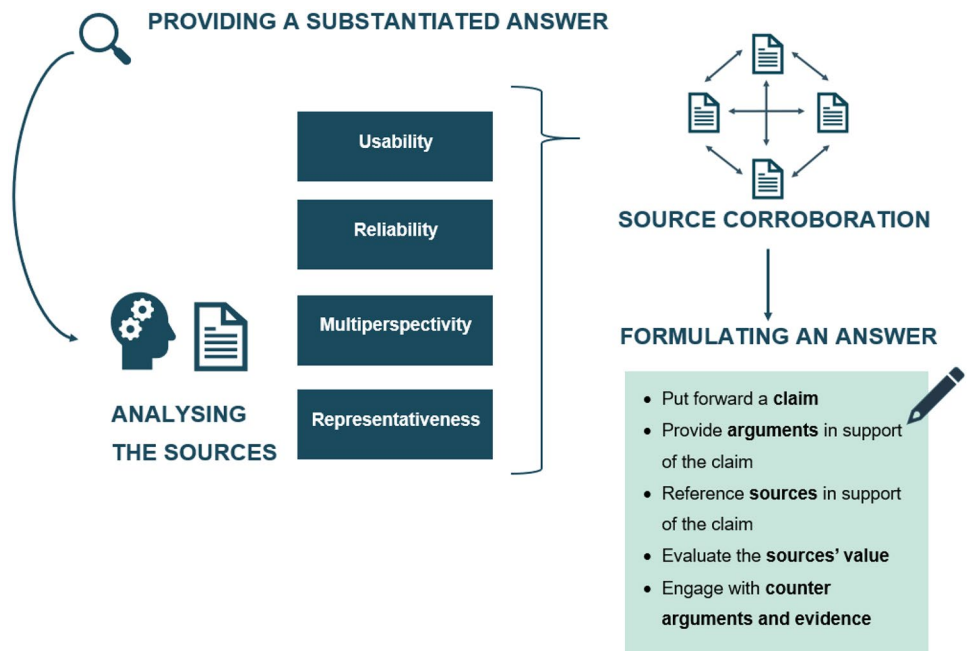
In designing these materials, maximum adherence to the initial design principles was pursued. In this respect, the corona circumstances mainly created challenges for teachers' role in modeling, coaching, and explicit teaching and for interaction. For synchronous remote education, digitized interactive presentations were created via Nearpod that allowed for whole-class interaction in an online environment. Suggestions were provided for online tools (such

Fig. 6 Example of summarizing document on reliability of sources

The videos were developed for substantive knowledge and for the acquisition of second-order and procedural knowledge. They hence provided a substitute for modeling and explicit teaching by the teacher. We also constructed step-by-step guides for the development of digital learning modules, based on the developed videos as well as on online exercises which provided students with immediate feedback on their answers (via Edpuzzle).

Specific guidelines were provided for teachers as to which lesson (segments) to preferably organize in class and which in remote education. It was recommended that whole-class discussions and group work take place in the classroom, in order to facilitate interaction among students and coaching by the teacher.

Intervention Study (2nd Evaluation and Reflection Phase)

The revised lesson series was evaluated by means of an intervention study via which we collected data on students' historical thinking and teachers' experiences with the materials. This evaluation then allowed us to assess the lesson series, both in light of the effectiveness of the underlying design principles to foster students' historical thinking, as well regarding the concrete applicability of the materials (i.e., their social validity).

Evaluating the Lesson Series

A call was launched among Flemish history teachers to find teachers willing to implement the lesson series in their practice. Between January and April 2021, twenty-four teachers (1115

as Google forms) allowing students to interact and work together on a task. For asynchronous remote education, a collection of short videos was developed by the design team.

Fig. 7 Visual organizer on providing a substantiated answer to a historical question (procedural knowledge)

Table 4 Competency levels for the revised criterion of argumentation based on sources as evidence

Criterion	1	2	3	4
Argumentation in support of the claim, based on sources	No arguments derived from the sources are used to support the position taken	The position taken is supported only to a limited extent by arguments derived from sources: • One or more arguments are mentioned • But: the argument(s) are not used as such/are not explicitly put forward in support of the position taken (e.g., only descriptive)	The position taken is mostly supported by arguments derived from sources: • One or more arguments are mentioned • But: only some of the arguments are explicitly put forward in support of the position taken	The position taken is fully supported by arguments derived from sources • Multiple arguments are mentioned • And: arguments are explicitly put forward in support of the position taken
Quality of the argumentation in support of the claim	No arguments, derived from the sources, are used to support the position taken	The argumentation derived from the sources is incorrect: One or more arguments are mentioned, but none of the arguments are correct	The argumentation derived from the sources is partially correct: At least one correct argument is mentioned	The argumentation derived from the sources is correct: At least two correct arguments are mentioned
Use of sources in support of the claim	The position taken is supported by concrete sources Or sources are referred to only in a general way (e.g. "based on the sources I argue that...")	The position taken is supported only to a limited extent by concrete sources • Only one concrete sources is used in support of the position taken • Other sources are not referred to concretely or not mentioned at all.	The position taken is mostly supported by concrete sources: • Multiple sources are mentioned explicitly in support of the position taken • But: not all sources are referred to concretely (it is not always clear which source is referred to) or sources are not put forward in support of the position taken	The position taken is fully supported by concrete sources Multiple sources are mentioned explicitly in support of the position taken

students) tested the materials. Teachers participated in a training session which included an explanation of the design principles, the goals of the lesson series, and the lesson plans. Another six teachers (266 students) functioned as a control group.

To evaluate the social validity of the lesson series, teachers were asked about their experiences with the materials via online questionnaires and interviews. They completed a questionnaire after each lesson registering how the lesson was administered (in-class or remote (a)synchronous) and providing general feedback regarding the feasibility and applicability of each lesson. To oversee the implementation of the lesson series, we also asked teachers to indicate whether they had deviated from the provided lesson plans and if so, how and why. Two semi-structured interviews were conducted with each teacher, one after the second or third lesson, another at the end of the lesson series. These interviews elaborated on teachers' reports in the online questionnaire and gathered in-depth information on whether they found the materials to be relevant and useful in practice.

To evaluate the effectiveness of the lesson series on students' historical thinking, students completed a digital pre- and posttest. This pre- and posttest consisted of a historical inquiry task, similar to those of the lesson series. Students also answered two open-ended questions measuring procedural knowledge related to providing a substantiated answer to a historical question. Lastly, the pre- and posttest examined changes in students' epistemological beliefs based on the statements of Wiley et al. (2020).

Assessing the Lesson Series' Social Validity

Based on teachers' reports gathered through the online questionnaire and interviews, the social validity of the lesson series was assessed. Overall, these reports pointed to a positive assessment of the materials' social validity. Concerning knowing history, teachers generally appreciated the lesson series' adherence to recent historiography and the inclusion of historiographical debates as it is challenging for them to keep up to date with academic research.

Most outspoken, however, were teachers' comments regarding the way that doing history was integrated throughout the lesson series, which was experienced as a significant change from their conventional practice: not only because doing history was given more attention than in teachers' regular practice, but also because it was covered in a thorough and in-depth way. Teachers particularly appreciated the material's attention to doing history. The use of explicit teaching and modeling on second-order and procedural knowledge was considered a great asset of the material. During the interviews, most teachers reported that the explicit teaching and modeling aspects in the lesson series made them aware that their own practices often touched upon aspects of doing history only briefly and superficially and

implicitly. Furthermore, some concepts included in the lesson series (such as sources' representativeness or usability) were not yet covered in their own teaching practice. The detailed attention in the lesson series to second-order and procedural knowledge was thus not only considered an added value for their students, but also for themselves. Explicit teaching and supporting (scaffolding) documents regarding second-order and procedural knowledge as well as the explanatory videos on these aspects were mentioned as being particularly valuable in light of the introduction of the new history standards, also outside of this particular lesson series. Teachers also expressed great appreciation for the extensive set of sources provided in the material, in particular in the inquiry tasks, as this is one of the challenges they face when designing instructional materials. Moreover, they acknowledged the usefulness of confronting students with inquiry tasks as an effective way to foster and evaluate students' historical thinking. While the evaluation rubric was generally acknowledged as a useful instrument for providing feedback on these inquiry tasks, it was also considered time-consuming. Teachers were therefore looking for additional support to provide feedback or evaluate aspects of doing history in a more concise way.

Overall, teachers' feedback demonstrated a great appreciation for the lesson series' underlying design principles, such as the use of inquiry tasks, explicit teaching, and modeling. Teachers, however, did identify a number of issues regarding the practical applicability and usefulness of the lesson series, mainly related to how we gave shape to the inquiry tasks. One difficulty in this regard was that the estimated timing was not always realistic. The majority of teachers spent more time on the inquiry activities than we had anticipated. As a result, some teachers could not complete the entire lesson series. Timing issues were often related to the difficulty of the inquiry tasks. Even though this was already addressed in the first revision of the lesson series, teachers still considered the use of (textual) sources and writing tasks very (in a few cases: too) demanding for their students, certainly in schools where students had lower literacy skills. For these students, the inquiry tasks were only possible with a lot of additional support and coaching by the teacher.

For a few teachers, the difficulty of the inquiry tasks also lead to concerns about students' motivation. They reported that as these tasks required a high cognitive load from students, students became less motivated and expressed a desire to return to "normal" history classes (i.e., teacher-guided and with an emphasis on substantive knowledge). Although this issue was raised in particular among teachers for whom the lesson series' approach deviated strongly from their conventional practice, the majority of teachers shared the concern that the lesson series in general was rather demanding for students.

For our part, the interviews with teachers made clear that we had underestimated the level of variance in students'

historical thinking. Considering that some students did not have a lot of experience with doing history, concerns regarding the difficulty level of the materials were not entirely unwarranted. In light of this, the lesson series' focus on historical thinking in a holistic way as well as the use of multiple inquiry tasks was indeed quite ambitious in the time span of 12–14 lessons.

Because of the COVID-19 pandemic, it is difficult to fully separate concerns about the lesson series in particular from the more general impact of the pandemic-related restrictions. During the interviews, teachers repeatedly mentioned that remote education, combined with other corona restrictions in society, took a high toll on students' motivation and learning in general. Despite the materials which we had developed for remote education, teachers also reported that essential aspects of the lesson series could not always be fully implemented. It remained challenging to adequately coach students, provide appropriate scaffolding, and organize whole-class discussions via remote education. These circumstances may thus have added new challenges to the lesson series and amplified existing ones (e.g., regarding students' motivation).

Assessing the Lesson Series' Effectiveness on Students' Historical Thinking Ability

To assess the effects of the lesson series on students' historical thinking, participants' performance on the pre- and posttest were analyzed and compared to a control group using multilevel analyses (see Wilke et al., 2022b). For these analyses, only students who had completed the entire lesson series were included ($N = 402$).

The multilevel models showed that, when controlling for differences in pretest scores, the lesson series significantly improved students' performance on the historical inquiry task ($B = 4.79$, $p < 0.01$) as well as their procedural knowledge ($B = 2.06$, $p < 0.01$). The lesson series was hence effective in fostering students' historical thinking, in terms of historical inquiry skills as well as related procedural knowledge. Nevertheless, no effects were found regarding students' epistemological beliefs, and significant differences remained in place between students and schools for the inquiry task and for procedural knowledge.

Finalization of the Lesson Series (3rd Design and Construction Phase)

After the assessment of the lesson series, which was based on the data gathered in the intervention study (i.e., the pre- and posttests of students, as well as teachers' reports and interviews), a final revision of the lesson series was implemented. Considering that the lesson series was successful overall in improving students' historical thinking and no issues were raised regarding the content of the lesson series (in terms of knowing history) or the design principles, the final revision of the lesson series focused mainly on accommodating the issues raised by teachers connected to the practical applicability of the material.

To this end, the explanatory document was elaborated to not only detail the design principles and main goals of the lesson series but to also address teachers' concerns regarding the difficulty of the lesson series. It was explained that the lesson series included multiple inquiry tasks, but because of their demanding nature, they should not necessarily be completed over the course of 12–14 history classes. Rather, the inquiry tasks functioned as concrete examples serving as blueprints for the design of tasks on different topics.

To accommodate possible issues with the difficulty of the tasks and students' motivation, the explanatory document emphasized that teachers can adapt them to their students' needs, considering their historical thinking as well as general literacy skills and knowledge. In the lesson plans, concrete suggestions were added for how to do so, among others by adapting the inquiry tasks in terms of length and form. For instance, concrete suggestions were given to reduce source sets from five to three sources, and less demanding alternatives were offered for the writing tasks (e.g., additional writing schemes or presentation of the answer via concept maps or short videos on Flipgrid).

Timing estimates for the various lessons and lesson segments were adapted to correspond better with teachers' reported timings, but it was highlighted that these timings were only indicative and vary according to students' prior knowledge.

In the student materials, extra attention was paid to the structure of the materials. A table of contents was added as well as cross-references between the various materials (e.g., from the learning text to the related inquiry tasks). A visual representation of the structure of the entire lesson series was also added. At the end of each lesson, its specific learning goals were listed, distinguishing between knowing and doing history. The summarizing documents and visual organizers on second-order and procedural knowledge were brought together in a separate "doing history" booklet to be also used outside of this specific lesson series.

To support teachers in providing feedback and evaluating certain aspects of historical thinking, a booklet was designed containing exemplary questions and tasks based on novel sources connected to the theme of decolonization that could be used for evaluation, including model responses and grading guidelines. The format of these questions could also be used as blueprints for evaluating historical thinking in relation to other historical themes.

Reflection and Output of the Design Research

This study demonstrated the efficacy of design-based research to design lesson materials that are socially valid and of the effectiveness of design principles derived from the model of cognitive apprenticeship on students' learning.

First, this research shows that the overall design principles identified in the literature and applied in the lesson series appeared to be overall effective in promoting historical thinking, hence providing additional evidence for the effectiveness of principles derived from cognitive apprenticeship. By striving for a close connection to historiography, the lesson materials also managed to address historical thinking in a holistic way and bridge the gap between school and academic knowledge, thus overcoming the disconnect between both.

By involving and supporting teachers in the design and implementation of the lesson series, we were also able to create materials that were overall considered socially valid. On the other hand, the authors reviewed the results of this study and found that teachers had difficulty in translating design principles into feasible, concrete materials. The focus of the various iterations of the design process was not so much on the accurate implementation of the design principles themselves but, rather, on their practical application. This case study was a demonstration of how an appropriate and effective implementation of design principles requires multiple evaluations, assessments, and eventual adaptations in light of various practical and contextual factors, such as teachers' prior knowledge on historical thinking, the available time, students' motivation, and literacy skills. In some cases, a trade-off may even be necessary between what is theoretically the best approach and what is concretely feasible given the context. For example, formulating a written answer to an inquiry task is considered extremely useful to foster students' historical thinking (Nokes & De La Paz, 2018). However, as this is both time-consuming and possibly demotivating for at least some students, it may be necessary—in light of contextual and practical factors—to alternate these written answers with other answer formats.

Considering that obtaining social validity is essential to ensure that a curriculum is also used outside the context of one distinct study, this study stresses again the importance of involving teachers closely in the design process and to take their comments seriously.

For future studies aimed at fostering students' historical thinking, this formative design study highlights two important aspects. First, in terms of fostering historical thinking among students, it is important that such studies adopt an integrative approach towards historical thinking, with a combined focus on knowing and doing history. Doing so is essential because historical thinking relies on a close connection between knowledge about the past (knowing history) and knowledge about the discipline of history (doing history). Second, this study demonstrated the importance of taking into account practical and contextual (both teacher and student bound) considerations when translating theoretical principles for fostering historical thinking into actual educational materials. Adjustments are sometimes needed in order for materials to be applicable in practice.

Despite the overall positive results of the designed materials in this study, several challenges remain in place. Future studies may therefore benefit from implementing a number of changes. First, although the lesson series succeeded in fostering students' historical thinking, it failed to generate changes in students' epistemological beliefs. Considering that these beliefs underlie historical thinking, it remains important to consider how such epistemic changes may be achieved. In hindsight, we believe the absence of changes in students' epistemological beliefs may be due to the lack of explicit teaching regarding these beliefs in the lesson materials. Therefore, for the design of future interventions, we recommend to include explicit attention to epistemological reflection as this seemed to generate positive results with regard to other aspects of historical thinking. At the same time, however, we should not overestimate the potential of a single lesson series in generating profound changes in students' epistemological beliefs. Rather, the development of nuanced epistemological beliefs about history should be considered a goal for history education as a whole throughout secondary education rather than of a single, confined lesson unit.

A second challenge that remains in place is that teachers expressed concern about students' motivation, both with regard to working with textual sources and with regard to having to take on an active role in group or independent work. Regarding the former, we made further adjustments to the lesson materials to decrease the reliance on textual sources and to allow for a better balance between visual and textual sources. However, considering that we were unable to organize a third evaluation and reflection phase, we cannot yet say whether these adaptations are sufficient. This challenge highlights an important difficulty associated with the design of materials for a subject that is inherently very linguistic. Working with (textual) sources is a core aspect of the subject that cannot be avoided. As we noticed throughout this study, however, students' literacy skills varied strongly across different classes, making working with textual sources very challenging. While visual sources may provide a partial solution to this challenge, they are not necessarily easier for students to use, as the critical analysis of visual sources also requires particular procedural knowledge. We therefore recommend that future studies offer a wide range of options, with both visual and textual sources that differ in terms of difficulty, so that teachers can select those sources that they

consider most aligned with the needs and capabilities of their particular group of students. Regarding students' motivation for taking on an active role during inquiry tasks, we would recommend for these tasks to be more dispersed throughout the year. By doing so, the cognitive load that students experience when engaging in such tasks may be better distributed throughout the school year, hence preventing students from becoming demotivated. Another recommendation in light of enhancing students' motivation in future design studies might be to allow them to formulate and investigate their own historical questions. This might increase the authenticity of the inquiry tasks (Freedman, 2015) and offers an opportunity to include the principle of exploration into the materials. This requires, however, a great deal of autonomy from students and may hence be more suited towards the end of secondary education, after several years of immersion in the act of thinking historically.

A final challenge is the consolidation of the research's contribution to practice and the dissemination of the materials outside the group of teachers involved in the design process. To facilitate this, the materials will be used in professionalization initiatives for teachers and were made freely available via the website of the university's teacher training program to be used as such in lessons on decolonization, yet also on a more conceptual level, as a design blueprint for the development of new instructional materials.

Data Availability The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research supporting data is not available.

Declarations

Ethics Approval The authors declare that research ethics approval for this study was provided by the Social and Societal Ethics Committee (SMEC-KU Leuven).

Conflict of Interest The authors declare no competing interests.

References

Barton, K. C., & Levstik, L. S. (2004). *Teaching history for the common good*. Lawrence Erlbaum Associates.

Bentrovato, D., & Van Nieuwenhuyse, K. (2020). Confronting "dark" colonial pasts: A historical analysis of practices of representation in Belgian and Congolese schools, 1945–2015. *Paedagogica Historica, 56*(3), 293–320. https://doi.org/10.1080/00309230.2019.1572203

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32–42. https://doi.org/10.3102/0013189X018001032

Buehl, M. M., & Alexander, P. A. (2001). Beliefs about academic knowledge. *Educational Psychology Review, 13*(4), 385–418. https://doi.org/10.1023/A:1011917914756

Collins, A., Brown, J. S., & Holum, A. (1991). Cognitive apprenticeship: Making thinking visible. *American Educator, 6*(11), 1–18. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.124.8616&rep=rep1&type=pdf

Cornell University. (n.d). *The cornell note taking system.* https://lsc.cornell.edu/how-to-study/taking-notes/cornell-note-taking-system/

De La Paz, S. (2005). Effects of historical reasoning instruction and writing strategy mastery in culturally and academically diverse middle school classrooms. *Journal of Educational Psychology, 97*(2), 139–156. https://doi.org/10.1037/0022-0663.97.2.139

De La Paz, S., & Felton, M. K. (2010). Reading and writing from multiple source documents in history: Effects of strategy instruction with low to average high school writers. *Contemporary Educational Psychology, 35*(3), 174–192. https://doi.org/10.1016/j.cedpsych.2010.03.001

De Wever, B., Vandepitte, P., & Jadoulle, J. -L. (2011). Historical education and didactics of history in Belgium. In E. Erdmann & W. Hasberg (Eds.), *Facing, mapping, bridging diversity. Foundation of a European discourse on history education* (Vol. 1, pp. 45–90). Wochenschau Wissenschaft.

Freedman, E. B. (2015). 'What happened needs to be told': Fostering critical historical reasoning in the classroom. *Cognition and Instruction, 33*(4), 357–398. https://doi.org/10.1080/07370008.2015.1101465

Gouëdard, P., Pont, B., Hyttinen, S., & Huang, P. (2020). *Curriculum reform: A literature review to support effective implementation* (OECD Education Working Paper No. 239). Organisation for Economic Co-operation and Development. https://doi.org/10.1787/efe8a48c-en

Havekes, H., Arno-Coppen, P., Luttenberg, J., & van Boxtel, C. (2012). Knowing and doing history: A conceptual framework and pedagogy for teaching historical contextualisation. *International Journal of Historical Learning, Teaching and Research, 11*(1), 72–93.

Hicks, D., Doolittle, P., & Lee, J. K. (2004). Social studies teachers' use of classroom-based and web-based historical primary sources. *Theory & Research in Social Education, 32*(2), 213–247. https://doi.org/10.1080/00933104.2004.10473253

Huijgen, T., van Boxtel, C., & van de Grift, W. (2014). Testing elementary and secondary school students' ability to perform historical perspective taking: The constructing of valid and reliable measure instruments. *European Journal of Psychology of Education, 29*, 653–672. https://doi.org/10.1007/s10212-014-0219-4

Huijgen, T., van de Grift, W., van Boxtel, C., & Holthuis, P. (2018). Promoting historical contextualization: The development and testing of a pedagogy. *Journal of Curriculum Studies, 50*(3), 410–434. https://doi.org/10.1080/00220272.2018.1435724

Kazdin, A. (2005). Social validity. In B.S. Everitt, & D. C. Howell (Eds.), *Encyclopedia of Statistics in Behavioral Science,* (pp. 1875–1876), Wiley. https://doi.org/10.1002/0470013192.bsa632

Land, J., Sanders, T., & van den Bergh, H. (2009). Duidelijke leerteksten in het vmbo. *Levende Talen Tijdschrijft, 10*(4), 3–13.

Lee, P. (2004). Understanding history. In P. Seixas (Ed.), *Theorizing Historical Consciousness* (pp. 129–164), University of Toronto Press.

Lee, P. (2005). Putting principles into practice: Understanding history. In M. S. Donovan & J. D. Bransford (Eds.), *How Students Learn: History in the Classroom* (pp. 31–77). The National Academies Press.

Lee, P., & Ashby, R. (2000). Progression in historical understanding among students ages 7–14. In P. Stearns, P. Seixas, & S. Wineburg

(Eds.), *Knowing, Teaching, and Learning History: National and International Perspectives* (pp. 199–222). New York University Press.

Lévesque, S. (2009). *Thinking historically*. University of Toronto Press.

Maggioni, L., VanSledright, B., & Alexander, P. (2009). Walking on the borders: A measure of epistemic cognition in history. *The Journal of Experimental Education, 77*(3), 187–213. https://doi.org/10.3200/JEXE.77.3.187-214

McKenney, S., & Reeves, T. C. (2019). *Conducting educational design research*. Routledge.

Metzger, S. A., & McArthur Harris, L. (2018). Introduction: History education in (and for) a changing world. In: In S. A. Metzger, & L. M. Harris (Eds*.). The Wiley international handbook of history teaching and learning* (pp. 1–12). Wiley Blackwell.

Monte-Sano, C. (2012). What makes a good history essay? Assessing Historical Aspects of Argumentative Writing. *Social Education, 76*, 294–298.

Monte-Sano, C., & De La Paz, S. (2012). Using writing tasks to elicit adolescents' historical reasoning. *Journal of Literacy Research, 44*(3), 273–299. https://doi.org/10.1177/1086296X12450445

Monte-Sano, C., Paz, S. D. L., & Felton, M. (2014). *Reading, thinking, and writing about history: teaching argument writing to diverse learners in the common core classroom, grades 6–12*. Teachers College Press.

Nokes, J. (2010). Observing literacy practices in history classrooms. *Theory & Research in Social Education, 38*(4), 515–544. https://doi.org/10.1080/00933104.2010.10473438

Nokes, J. D., & De la Paz, S. (2018). Writing and argumentation in history education. In S. A. Metzger & L. McArthur Harris (Eds.), The Wiley international handbook of history teaching and learning (pp. 551–578). Wiley Blackwell.

Nokes, J. D., Dole, J. A., & Hacker, D. J. (2007). Teaching high school students to use heuristics while reading historical texts. *Journal of Educational Psychology, 99*(3), 492–504. https://doi.org/10.1037/0022-0663.99.3.492

Pauk, W., & Owens, R. (2010). *How to Study in College (10 ed.)*. Wadsworth.

Popkewitz, T. (2004). The alchemy of the mathematics curriculum: Inscriptions and the fabrication of the child. *American Educational Research Journal, 41*(1), 3–34. http://www.jstor.org/stable/3699383

Reisman, A. (2012). Reading like a historian: A document-based history curriculum intervention in urban high schools. *Cognition and Instruction, 30*(1), 86–112. https://doi.org/10.1080/07370008.2011.634081

Seixas, P., & Morton, T. (2013). The big six historical thinking concepts. Nelson Education.

Stoel, G. L., van Drie, J. P., & van Boxtel, C. A. M. (2015). Teaching towards historical expertise. Developing a pedagogy for fostering causal reasoning in history. *Journal of Curriculum Studies*, *47*(1), 49–76. https://doi.org/10.1080/00220272.2014.968212

Stoel, G. L., van Drie, J. P., & van Boxtel, C. A. M. (2017a). The effects of explicit teaching of strategies, second-order concepts, and epistemological underpinnings on students' ability to reason causally in history. *Journal of Educational Psychology, 109*(3), 321–337. https://doi.org/10.1037/edu0000143

Stoel, G., Logtenberg, A., Wansink, B., Huijgen, T., van Boxtel, C., & van Drie, J. (2017b). Measuring epistemological beliefs in history education: An exploration of naïve and nuanced beliefs. *International Journal of Educational Research, 83*, 120–134. https://doi.org/10.1016/j.ijer.2017.03.003

University of Michigan. (2021). *Disciplinary literacy tools structure, a process for inquiry and argument writing*. https://readinquirewrite.umich.edu/tools-structure/

van Boxtel, C., & van Drie, J. (2017). Engaging students in historical reasoning: The need for dialogic history education. In M. Carretero, S. Berger, & M. Grever (Eds.), *Palgrave Handbook of Research in Historical Culture and Education* (pp. 573–589). Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-52908-4_30

van Boxtel, C., & van Drie, J. (2018). Historical reasoning: Conceptualizations and educational applications. In S. A. Metzger & L. M. Harris (Eds.), *The Wiley international handbook of history teaching and learning* (pp. 149–176). Wiley Blackwell.

van Boxtel, C., Voet, M., & Stoel, G. (2021). Inquiry learning in history. In R. G. Duncan & C. A. Chinn (Eds.), *International Handbook of Inquiry and Learning* (1st ed., pp. 296–310). Routledge. https://doi.org/10.4324/9781315685779-20

van Drie, J., & van Boxtel, C. (2008). Historical reasoning: Towards a framework for analysing students' reasoning about the past. *Educational Psychology Review, 20*(2), 87–110. https://doi.org/10.1007/s10648-007-9056-1

van Drie, J., Braaksma, M., & Van Boxtel, C. (2015). Writing in history: Effects of writing instruction on historical reasoning and text quality. *Journal of Writing Research*, *7*(1), 123–156. https://doi.org/10.17239/jowr-2015.07.01.06

van Drie, J., van Boxtel, C., Jaspers, J., & Kanselaar, G. (2005). Effects of representational guidance on domain specific reasoning in CSCL. *Computers in Human Behavior, 21*(4), 575–602. https://doi.org/10.1016/j.chb.2004.10.024

van Drie, J., van Boxtel, C. & Stam, B. (2013). 'But why is this so important?': Discussing historical significance in the classroom. *History Education Research Journal, 12*(1), 146–168. https://doi.org/10.18546/HERJ.12.1.11

van Drie, J., van Boxtel, C., & van der Linden, J. L. (2006). Historical reasoning in a computer-supported collaborative learning environment. In A. M. O'Donnell, C. E. Hmelo-Silver, & G. Erkens (Eds.), *Collaborative learning, reasoning, and technology* (pp. 265–296). Lawrence Erlbaum Associates Publishers.

van Drie, J., & van de Ven, P. -H. (2017). Moving ideas: An exploration of students' use of dialogue for writing in history. *Language and Education, 31*(6), 526–542. https://doi.org/10.1080/09500782.2017.1326504

Van Hover, S. D., & Yeager, E. A. (2003). Challenges facing beginning history teachers: An exploratory study. *International Journal of Social Education, 19*(1), 8–21.

VanSledright, B., & Limón, M. (2006). Learning and teaching social studies: A review of cognitive research in history and geography. In P. Alexander & P. Winne (Eds.), *Handbook of educational Psychology* (pp. 545–570). Lawrence Erlbaum.

Van Nieuwenhuyse, K., Roose, H., Wils, K., Depaepe, F., & Verschaffel, L. (2017). Reasoning with and/or about sources? The use of primary sources in Flemish secondary school History education. *Historical Encounters: A Journal of Historical Consciousness, Historical Cultures, and History Education, 4*(2), 48–70.

Van Nieuwenhuyse, K. (2020). From knowing the national past to doing history. History (teacher) education in Flanders since 1918. In C. Berg, & T. Christou (Eds.), *The Palgrave handbook of history and social studies education* (pp. 355–386). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-37210-1

Van Nieuwenhuyse, K., Wils, K., Clarebout, G., & Verschaffel, L. (2015). The present in Flemish secondary history education through the lens of written history exams. *McGill Journal of Education / Revue Des Sciences De L'éducation De McGill, 50*(2–3), 433–451. https://doi.org/10.7202/1036440ar

Voet, M., & De Wever, B. (2016). History teachers' conceptions of inquiry-based learning, beliefs about the nature of history, and their relation to the classroom context. *Teaching and Teacher Education, 55*, 57–67. https://doi.org/10.1016/j.ijer.2017.03.003

Voet, M., & Wever, B. D. (2017). History teachers' knowledge of inquiry methods: An analysis of cognitive processes used during a historical inquiry. *Journal of Teacher Education, 68*(3), 312–329. https://doi.org/10.1177/0022487117697637

Wansink, B. G. -J., Akkerman, S., & Wubbels, T. (2016). The certainty paradox of student history teachers: Balancing between historical facts and interpretation. *Teaching and Teacher Education, 56*, 94–105. https://doi.org/10.1016/j.tate.2016.02.005

Wiley, J., Griffin, T. D., Steffens, B., & Anne Britt, M. (2020). Epistemic beliefs about the value of integrating information across multiple documents in history. *Learning and Instruction*, *65*, 101266. https://doi.org/10.1016/j.learninstruc.2019.101266

Wilke, M., & Depaepe, F. (2019). Teachers and historical thinking. An exploration of the relationship between conceptualization, beliefs and instructional practices among Flemish history teachers. *International Journal for History and Social Sciences Education, 4*, 101–135.

Wilke, M., Depaepe, F., & Van Nieuwenhuyse, K. (2022a). The interplay between historical thinking and epistemological beliefs: a case study with history teachers in Flanders. *Historical Encounters, 9*(1), 196–219. https://doi.org/10.52289/hej9.111

Wilke, M., Depaepe, F., & Van Nieuwenhuyse, K. (2022b). Fostering historical thinking and democratic citizenship? A cluster randomized controlled intervention study. *Contemporary Educational Psychology, 71*, 102–115. https://doi.org/10.1016/j.cedpsych.2022.102115

Wineburg, S. (2001). *Historical thinking and other unnatural acts*. Temple University Press.