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# **Preparing pre-service history teachers for organizing inquiry-based learning: The effects of an introductory training program.**

## **ABSTRACT**

The present study investigates a training program aimed at preparing pre-service history teachers for organizing inquiry-based learning (IBL) in class. This program consisted of a workshop and an assignment during the teaching internship period. Pre- and posttests indicate that the workshop had a significant effect on self-efficacy and attitude toward IBL, but also that most student teachers' attitudes had again changed after the assignment. Related to this, student teachers' lesson plans revealed three different templates, representing distinct interpretations of 'inquiry'. An analysis of reflection papers and interviews describes how the context of the teaching internship further shaped student teachers' thinking.

## **1. INTRODUCTION**

History has been traditionally known, and sometimes feared, as a school subject dominated by teacher-centered activity and a strong focus on learning and understanding facts. In educational research, however, the focus has typically lain on student-centered approaches with a focus not only on content, but also on disciplinary thinking (see e.g. the review by VanSledright & Limón, 2006). As a process drawing on knowledge that lies behind the actual production of historical accounts (e.g. concepts such as evidence, cause and effect, significance), disciplinary thinking is regarded as essential for a meaningful organization of content knowledge, but also shapes one's understanding of what history is really about (Lee, 2005).

Over the years, different research strands have arisen across a number of countries, each with their own focus on disciplinary thinking in history. For example, the historical thinking heuristics used by several US-based researchers (e.g. Nokes, Dole, & Hacker, 2007; Reisman, 2012; Wineburg, 1991a) concentrate on strategies for reading historical sources (e.g. contextualizing, corroborating), whereas the 'big six' historical thinking concepts by Canadian authors Seixas and Norton (2012) introduce a number of meta-concepts that support thinking about the past (e.g. historical perspectives, the ethical dimension). Another example, this time from Europe, is the historical reasoning framework by van Drie and van Boxtel (2008), which

describes components of reasoning with historical information (e.g. using sources, forming arguments).

Regardless of these different, albeit complimentary, approaches, there is a general agreement across research strands that inquiry-based learning (IBL) is one of the most promising approaches for teaching both content and disciplinary thinking skills (Reisman, 2012; Seixas, 1999; van Drie & van Boxtel, 2008). At first, this common ground can be hard to notice because researchers have used various terms to refer to IBL-activities, with commonly used labels like: doing history (e.g. Seixas, 1999), document-based lesson (e.g. Reisman, 2012), and historical inquiry (e.g. van Drie & van Boxtel, 2008). In truth, each of these concepts can be grouped under the umbrella of inquiry-based learning, a teaching approach that engages students in discipline-specific investigations, and emphasizes practices of academic inquiry, in which it has its origins (Hmelo-Silver, Duncan, & Chinn, 2007). Within the context of history, IBL means that students are offered the opportunity to conduct their own investigations into the past, through an analysis of historical sources (Voet & De Wever, 2016).

One of IBL's main characteristics is that it confronts students with *ill-structured* problems, which cannot be resolved with a high degree of certainty. Contrary to well-structured problems, where there is a single correct answer, there usually are different solutions to IBL tasks, each with their particular strengths and weaknesses (King & Kitchener, 1994). Moreover, IBL is most effective in facilitating disciplinary thinking when it engages students in *knowledge transformation*, which calls for constructive mental activity that brings together information from various sources, in order to form and support one's own claims. This goes beyond knowledge telling, which essentially comes down to a re-telling of the available information (Wiley & Voss, 1996). Related to this, van Drie, van Boxtel, and Van der Linden (2006) reported that evaluative tasks, which require students to describe, but also make a judgement of historical events (e.g. Does responsibility for World War I solely lie with Germany?), are especially suited to stimulate this kind of constructive activity in history. Finally, IBL is, by definition, characterized by *extensive teacher scaffolding* (Hmelo-Silver et al., 2007). Because the combination of ill-structured problems and knowledge transformation implies a heavy cognitive burden to students, minimally guided investigations generally fail to produce learning (Kirschner, Sweller, & Clark, 2006).

According to the available evidence, IBL helps students to develop both historical and domain-general reasoning abilities, while also surpassing traditional teaching in terms of its contribution to students' factual knowledge (Reisman, 2012). Unfortunately, there is not much research available on how future teachers can be prepared to organize IBL-activities in history. Most of the work with history teachers has focused on the question why some teachers

implement IBL into their classroom, whereas other teachers do not, even though the latter group may well possess a strong knowledge of history (e.g. Barton & Levstik, 2003; McCrum, 2013; McDiarmid, 1994, Voet & De Wever, in press). The available findings indicate that teachers' beliefs about history and education in general play a central role in this process (Barton & Levstik, 2003), in addition to contextual factors, such as the curriculum (Van Hover & Yeager, 2003). Yet, a significant number of teachers also reports a limited knowledge or lack of experience with regard to IBL (Voet & De Wever, 2016). Teacher training is therefore regarded as a key factor for bringing IBL into the classroom (Martin & Monte-Sano, 2008; Yeager & Wilson, 1997).

A few studies have investigated training programs aimed at preparing student teachers to engage their students in reasoning with historical information. Some specifically cover the organization of IBL-activities (Levy, Thomas, Drago, & Rex, 2013), whereas others concentrate on related topics, such as the use of primary sources (Fehn & Koeppen, 1998; Seixas, 1998) or thinking critically about textbook accounts (Martin & Monte-Sano, 2008). Most importantly, these studies indicate that training programs can have a positive effect on students' beliefs and knowledge with regard to IBL (Fehn & Koeppen, 1998; Levy et al., 2013; Martin & Monte-Sano, 2008). Related to this, Levy et al. (2013) argued that such teacher training programs are particularly effective when they provide opportunities to observe models of IBL lessons, share ideas with and learn from peers, and prepare and organize IBL in real classroom settings (Levy et al., 2013).

However, it is still unclear how a training program focused on IBL influences student teachers' work in practice. Although studies have often investigated student teachers' experiences with a training program (e.g. Levy et al. 2013), there is not much known about whether and how these student teachers then proceed to organize IBL in practice, and why they do so. In fact, research suggests that the actual teaching context, with influences such as mentor teachers' suggestions, content coverage requirements, or students' reactions, may well have a negative impact on students' ability or willingness to attain a training program's goals (Fehn & Koeppen, 1998). In addition, it is not clear whether a training program would have the same effect for student-teachers across different types of training programs, as previous research indicates that teachers with an academic training may hold different conceptions of the field, compared to their non-academically trained counterparts (Yilmaz, 2010). The present study aims to further investigate these issues, in order to provide a more comprehensive picture of how a training program on IBL in history may affect student teachers' thoughts and practice.

## **2. AIMS**

The present study takes a closer look at student teachers' beliefs, work, and experiences during a training program that introduces them to inquiry-based learning (IBL) in history. Central to this undertaking are the following four research questions:

- What are the training program's effects on student teachers' beliefs, including their attitude about the use of sources in class, but also their perceived competence for organizing IBL?
- What kind of IBL-activities do student teachers design after following the training program?
- Is there a difference in academically and non-academically trained student teachers' response to the training program?
- Are there general themes or patterns in student teachers' first experiences with planning and teaching an IBL-activity?

## **3. DESIGN AND METHODS**

### **3.1. Intervention**

Based on design principles drawn from the literature (e.g. Doyle, 2006; Kagan, 1992; Levy et al., 2013), a training program was designed to provide student teachers with the knowledge necessary to organize inquiry-based learning (IBL) activities during the history lesson. This training consisted of a workshop followed by an assignment during students' teaching internship. Two student groups from different teacher training programs participated in the intervention.

#### *3.1.1. Context*

The present study took place in Flanders (Belgium), where the government sets attainment targets for most subjects in secondary education, including history. According to one of the key principles behind these attainment targets, students should be introduced to disciplinary thinking as soon as they enter secondary education, through classroom inquiries. In practice, however, history teachers have a lot of freedom in determining the content of their lessons. There are no central exams, and inspections by government officials are limited to one partial evaluation of the school program (not necessarily including history) every four years (for more information on Flemish history education, see De Wever, Vandepitte, & Jadoulle, 2011). According to earlier research in Flanders, historical reasoning and inquiry-based learning do not yet appear to be common practice in classrooms (Van Nieuwenhuysse, Wils, Clarebout, Draye, & Verschaffel, 2015; Voet & De Wever, 2017).

### 3.1.2. Workshop

A four-hour workshop was developed based on research on (history) teacher training. More specifically, three design principles informed this work. In line with the suggestion by Levy et al. (2013) to provide student teachers with opportunities to reflect on the planning and teaching of IBL-activities, and to share their ideas with others, the first design principle was aimed at *stimulating active learning*. During the workshop, theory was alternated with hands-on tasks, requiring student teachers to think about and discuss the ideas that were presented during the workshop. The description of the second and third design principle provide several illustrations as to how this was done.

The second design principle centered around *changing beliefs*, given the strong connection between teachers' beliefs and classroom practice (e.g. Kagan, 1992). In essence, the goal was to convince student teachers of IBL's value for developing students' mastery of history, in addition to their problem-solving skills in general. The introduction of the workshop combined a reflection task with direct instruction to attain this goal.

Student teachers started the workshop with a reflection task based on the one used in the study by Wineburg (1991b), who compared students' reasoning with a set of historical documents to that of expert historians. Similar to the original task, student teachers were given contradictory sources about whom started hostilities during the Battle of Lexington (1775), one of the first skirmishes between American colonists and the British military during the American Revolutionary War. They were then asked to work in dyads and discuss the following questions: (1) 'What is your conclusion with regard to the problem statement and information sources?', (2) 'How do you think students performed? Explain why you think this.', and (3) 'What does this imply for the goals of history education?' The main aim was to make student teachers see the importance of introducing students to disciplinary thinking, and to point out that strong knowledge of the content of history does not automatically result in an ability to engage in disciplinary thinking (for more information, see Wineburg, 1991b). After students had completed the task, each dyad shared its ideas, which were then further addressed in a thorough classroom-wide discussion.

Next, the instructor switched to direct instruction, drawing on findings from previous studies to debunk a number of popular myths about IBL in history, such as beliefs that students are not yet mature enough for IBL (e.g. Booth, 1994), or that IBL is aimed at making historians out of students (e.g. Lee & Ashby, 2000). While doing so, the instructor also referred to the attainment goals set out by the Flemish government, which explicitly state that critical investigations of sources are fundamental to learning about history (also see De Wever et al., 2011). To further

convince student teachers about the value of IBL, this part of the workshop also incorporated information from outside the field of history, such as economic studies indicating a steady increase of jobs that require non-routine analytical skills, while routine cognitive jobs are on the decline (Autor, Levy, & Murnane, 2003).

The third design principle focused on *providing a practical guide*, as previous work has shown that teachers mainly judge a training by its practical value (e.g. Doyle, 2006). The workshop first of all used findings from a previous study (see Voet & De Wever, 2016) to provide concrete examples of what does and does not constitute IBL in history. This information was then used to form a definition of IBL, which emphasized the importance of knowledge transformation (see section '1. Introduction'), and described IBL in terms of its constitutive parts; requiring students to (1) investigate a problem statement about the past, (2) through an analysis of information sources, (3) in order to form and support their own conclusions.

The main body of the workshop presented student teachers with a stepwise approach to organizing

IBL in history, consisting of 5 steps based on earlier research: (1) finding alternative perspectives on the topic or different parts of the story (see e.g. examples by Bohan & Davis, 1998; Nokes et al., 2007); (2) formulating a problem statement calling for knowledge transformation (van Drie et al., 2006); (3) selecting and adapting information sources for classroom use, by adding information about a source's origin, or including a glossary of terms (see e.g. De La Paz & Felton, 2010; Monte-Sano, 2010); (4) providing instructions with regard to practical organization, conducting a historical inquiry (based on the framework by Voet & De Wever (in press), and assessment of students' work; and (5) supervising the learning activity from start to finish.

Each of these steps was taught through a combination of direct instruction and individual or group work. For example, work on the second step 'formulating a problem statement' started with the instructor presenting a theoretical introduction on students' ability to ask historical questions, based on previous work by Logtenberg (2012). Student teachers were then asked to form dyads, study the introduction of the Wikipedia article on the French Revolution (1789), and formulate questions that they thought were fit for an inquiry task. As student teachers responded, the instructor grouped each of their questions according to the framework by van Drie & van Boxtel (2008), which distinguishes between descriptive, explanatory, comparative and evaluative questions. The differences between these question types were then determined through a class-wide discussion, in which the instructor emphasized evaluative questions' ability to stimulate knowledge transformation (see van Drie et al., 2006). Under the guidance of the instructor,

student teachers then attempted to re-formulate other types of questions as evaluative questions.

### *3.1.3. Assignment*

After the workshop had ended, student teachers were instructed to use what they had learned to prepare an IBL-activity, and teach it in a secondary school classroom, as a part of their teaching internship. This assignment was a mandatory part of the training program, and each of them thus had to complete it to receive a grade. Student teachers were informed that the IBL-activity had to take up at least one lesson period (i.e. 50 min). Apart from being instructed not to pick a topic that had been covered in one of the cases during the workshop, they were free to select a topic of their own choice. As part of planning this work, all student teachers were asked to confer with their mentor teacher (who received a formal letter from the teacher training program, requesting his or her cooperation with the assignment), and select a topic that was already on the curriculum planning for the period during which student teachers would be teaching the class.

### *3.1.4. Participants*

In Flanders, two systems of teacher training programs exist. On the one hand, there is an academic training (AT) program referred to as the specific teacher training, while on the other, there is a non-academic training (NAT) program called the integrated teacher training. The AT program is a one-year program that can only be followed by students who have previously attained an academic degree of master at a university (here: a master in history). Most of the AT program consists of theoretical training in teaching methodology combined with practical training. In contrast, the NAT program is taught at university colleges, and can be followed right after secondary education. In this three-year program, students select two subjects, and are taught the content as it is instructed in secondary education, in addition to following courses on teaching methodology (for more information, see De Wever, Vandepitte, & Jadoulle, 2011).

In total, 54 student teachers started the workshop. Of these, 27 student teachers followed an AT program, and 27 followed an NAT program. Students in the NAT program had to be in the third year of their studies to participate, in order to ensure that they had adequate knowledge of history. Meetings with the history teacher trainers prior to the workshop suggested that both student groups had little experience with IBL in history (an assumption that was confirmed by student teachers' reactions to the workshops). Due to various reasons, there was some drop-out as the intervention proceeded. For instance, some student teachers were taking the course for

the second time, but had already completed all of their teaching internships, while others simply dropped out of the program itself. In the end, 36 students completed the assignment.

### *3.1.5. Ethics*

The present study was in line with the general ethical basic assumptions specified in the faculty's general ethical protocol for scientific research. As the protocol states that advice of the faculty's ethical committee should only be requested in case of doubt about a research project's conformity to these guidelines, no further ethical approval was necessary. Before the start of the intervention, all student teachers received an informed consent form that provided more information about the research. In addition, this document informed them that data that would be gathered for the study (1) would be used solely for scholarly purposes, (2) would not be passed on to third parties, and (3) would be de-identified in case of publication. Each student teacher gave permission to use his or her data, by freely signing the informed consent.

## **3.2. Instruments and data**

In order to explore the outcomes of the intervention, several instruments were used to capture student teachers' beliefs related to IBL, and their experiences with preparing and carrying out an IBL-activity. Data were gathered through: a pretest and two posttests, the lesson plan of student teachers' IBL-activity, and two reflection papers. In addition, all student teachers who completed the assignment were invited to an interview afterwards.

### *3.2.1. Pre- and posttests.*

Prior to starting the workshop, all participating student teachers completed a short questionnaire about (1) the way they thought sources should be used in class, and (2) their perceived competence for conducting IBL-activities in general, but also a number of specific aspects of IBL. The first part of this instrument was based on findings from a previous study (Voet & De Wever, 2016a), while the second part was designed specifically with the workshop in mind, in order to ensure consistency with its contents. Right after the workshop had ended, student teachers completed the questionnaire a second time, together with (3) an anonymous evaluation of the workshop's content, based on the instrument developed by Ruys (2012). After student teachers had taught their IBL-activity in classroom, they were requested to complete the questionnaire a third and final time. More information about the contents of this questionnaire can be found in the results section.

### *3.2.2. Lesson plans*

Student teachers were required to hand in the lesson plan of the IBL-activity that they organized during their teaching internship. This lesson plan included (1) a chronological overview of each learning activity that made up the lesson, together with its timing and content; and (2) a copy of all materials that were used throughout the lesson, such as presentations, information sources, and student worksheets.

### *3.2.3. Reflection papers*

Student teachers were asked to document their work on the assignment in two reflection papers (see appendix A for the papers' writing prompts). The first paper asked them to describe and reflect on their preparation process, and in particular: (1) their general approach to preparing the IBL-activity, but also the specific steps that they took; and (2) parts of their preparation that they thought were particularly easy or hard, as well as their ideas about possible explanations. The second reflection paper required student teachers to report on the implementation of their IBL-activity in the classroom, including: (1) a general overview of how the lesson proceeded, things that did or did not go well, and possible explanations; and (2) their feelings about the IBL-activity, and what they learned from the assignment. All student teachers were required to hand in these papers no later than 7 days respectively after having finished their work on the preparation, and having carried out the lesson in the classroom. This deadline was instated to make sure that student teachers wrote the reflection papers when the activities in question were still fresh in their memory. It is also important to note that all student teachers were explicitly invited to give an honest account of both their experiences and beliefs, after being informed that there would be no repercussions if they reported negative experiences or expressed a critical opinion. The fact that the first author, who gave the workshop and collected all data, was otherwise not involved in either of the training programs, provided further reassurance to student teachers.

### *3.2.4. Interviews*

Finally, interviews were organized after students had handed in their lesson plans and reflection papers. All student teachers who had completed the assignment were invited to participate in these interviews, but unfortunately, only about three-fourths of them (N = 26 out of 36) were able to attend. Prior to the start of these interviews, the first author read each student teachers' assignment and marked unclear or interesting passages for further discussion. Each interview started with the question: "Can you explain why you chose [lesson topic] as the topic of your lesson". Afterwards, the interviews focused on the specific contents of each student teacher's

paper, with questions varying across participants. To give some examples, this included questions such as: “I was very much intrigued by what you wrote in the first reflection paper. At some point, you say that: I chose to implement the activity in the third school, because the mentor in the second school was not willing to supervise this assignment. Could you please further explain this?” or “I also wondered, at the end of the second paper, you state that: Now that I am more aware of the importance of teaching critical thinking to students, I will pay more attention to developing students’ historical reasoning skills. So did your vision then change after taking the workshop and organizing that lesson?” All interviews were taped using a digital recorder, and subsequently transcribed.

### **3.3. Analysis**

The analysis combines a quantitative and qualitative methodology. On the one hand, the results of the questionnaires, together with the workshop evaluation, provide an overview of the workshop’s effectiveness. On the other hand, student teachers’ lesson plans, reflection papers and interviews help to further illustrate the exact impact of the workshop on students’ thinking and work in practice.

#### *3.3.1. Approach.*

The results of the questionnaires were analyzed using SPSS 23. When one or more responses were missing, cases were excluded from the analysis. The evaluations of the workshop could not be connected to the other data due to the anonymous responses, and were therefore analyzed separately. A qualitative approach was used to analyze student teachers’ lesson plans, reflections, and interviews. A first reading of the lesson plans indicated that the main differences were situated on two dimensions (for more information, see Table 5): problem statement (i.e. ill- vs. well-structured) and student activity (i.e. knowledge telling vs. transformation). This resulted in three lesson templates that were subsequently used to code all lesson plans: fill in the blanks, synthesis, and critical inquiry (see the results section for more information). Student teachers’ reflection papers and interviews, when available, were analyzed together, as the latter’s main purpose was to elaborate on the reflection papers’ contents. A first reading of this data allowed to mark all passages that provided information on student teachers’ general experiences with implementing the task in their classroom, as well as their reasons for selecting a particular template. This information was used to construct a data matrix (see Miles & Huberman, 1994)

containing a summary of the results for each participant. Similar results were then grouped together, until several themes surfaced.

### *3.3.2. Reliability*

Contrary to the analysis of student teachers' interviews and lesson plans, which was primarily descriptive in nature, classifying student teachers' lesson plans into three templates required some interpretation. In order to check the reliability of the lesson plan analysis, about half of the lessons were independently examined by a second coder. This second coder was briefed about the three lesson templates, using the lesson plans from the cases that are presented in the results section. Afterwards, she independently coded 17 lesson plans (about half of the lesson plans that remained). Percentage agreement for coding was 88.25 (15 out of 17), which is above the advocated threshold of 80 percent (Riffe, Lacy, & Fico, 1998). In the 2 cases where opinions differed, a comparison of the lesson's content to the three lesson templates suggested that one of the coders had made a mistake.

## **4. RESULTS**

The first part of the results section takes a closer look at the training's effect through an overview of the pre- and posttests results. Student teachers' first attempts at organizing an IBL-activity in the classroom are then covered in the second part. In particular, this section outlines different templates that were found across their lesson plans. The third and final section looks further into student teachers' first experiences with IBL, and uses the information from the reflection papers and available interviews to provide suggestions as to why they differed in their approach to the IBL-activity.

### **4.1. Outcomes of the training**

Looking first at student teachers' evaluation of the workshop, Table 1 provides an overview of the mean scores. These results indicate that student teachers appreciated the workshop, and felt that it provided an adequate preparation for organizing IBL-activities in the classroom. The output of a MANOVA indicates that there were no significant differences between the evaluations of the AT and NAT teacher groups ( $F=1.14$ ,  $p=.36$ ).

**Table 1**

Student teachers' (N=52) evaluation of the workshop

Item (scale from 1 – strongly disagree, to 5 – strongly agree)	M (SD)
1. I thought that the approach of this workshop was pleasant.	3.88 (0.68)
2. This workshop was interesting.	3.98 (0.71)
3. The difficulty and pace of this workshop were fitting.	3.65 (0.87)
4. I did not understand much of this workshop ( <i>reverse worded</i> ).	1.65 (0.83)
5. This workshop offers me a good guide for bringing inquiry-based learning into practice.	4 (0.63)
6. During this workshop we encountered new contents/approaches that I did not know yet.	3.5 (1)
7. Workshops of this kind are an added value to teacher education.	4.08 (0.76)
8. I feel that this workshop helps me to improve my pedagogic approach in the classroom.	3.82 (0.73)

Note. Items adapted from Ruys (2012).

**Table 2**

Student teachers' (N=50) perceived competence for IBL, pre- and post-workshop.

How competent do you feel to...			
(scale from 1 – completely incapable, to 6 – completely capable)	M pre (SD)	M post 1 (SD)	1-tailed p
<i>IBL-activities in general</i>			
1. Organize and guide activities during which students conduct their own research about the past.	4.04 (0.7)	4.56 (0.58)	<.001*
<i>Specific components of IBL-activities</i>			
2. Use historical information to select a suitable and challenging topic that students can investigate in the classroom.	4.24 (0.8)	4.62 (0.86)	.002*
3. Formulate a problem statement that allows students to form their own conclusions about the past through self-directed study.	4.24 (0.8)	4.64 (0.75)	<.001*
4. Select and adapt information sources for tasks that require students to investigate a historical phenomenon by themselves.	4.23 (0.94)	4.47 (0.73)	.022
5. Create instructions so that students can critically analyze and process information about the past through a stepwise approach.	4.21 (1.07)	4.72 (0.76)	.001*
6. Develop teaching methods for guiding, managing and concluding inquiry-based learning activities for students.	4 (0.9)	4.35 (0.86)	.006*

Note. Bonferroni correction was applied to reduce the chance of a type 1 error due to the experiment-wise error rate (see Armstrong, 2014). Hence, \* indicates  $p < .008$  (i.e.  $\alpha$  of .05 divided by N=6 comparisons).

Moving on to student teachers' perceived competence for organizing IBL-activities, a MANOVA shows that there was again no significant difference between the AT and NAT group prior to the start of the workshop ( $F=2.12$ ,  $p=.07$ ). It also appears that, in general, student teachers felt already quite capable to organize IBL-activities. Even so, the results in Table 2 show a significant increase in their perceived competence right after the workshop. The only exception is item 4, where the difference from pre- to posttest was no longer significant after applying the Bonferroni correction.

**Table 3**

Student teachers' (N=33) perceived competence for IBL, pre- and post-assignment.

<b>How competent do you feel to...</b>			
(scale from 1 – completely incapable, to 6 – completely capable)	<b>M post1 (SD)</b>	<b>M post 2 (SD)</b>	<b>1-tailed p</b>
<i>IBL-activities in general</i>			
1. Organize and guide activities during which students conduct their own research about the past.	4.61 (0.61)	4.71 (0.76)	.19
<i>Specific components of IBL-activities</i>			
2. Use historical information to select a suitable and challenging topic that students can investigate in the classroom.	4.70 (0.85)	4.55 (0.83)	.17
3. Formulate a problem statement that allows students to form their own conclusions about the past through self-directed study.	4.70 (0.77)	4.61 (0.86)	.28
4. Select and adapt information sources for tasks that require students to investigate a historical phenomenon by themselves.	4.59 (0.79)	4.61 (0.93)	.46
5. Create instructions so that students can critically analyze and process information about the past through a stepwise approach.	4.82 (0.85)	4.64 (0.86)	.13
6. Develop teaching methods for guiding, managing and concluding inquiry-based learning activities for students.	4.5 (0.73)	4.45 (1)	.37

*Note.* Only 33 teachers completed the second posttest. Similar to the results in table 2, Bonferroni correction was used to reduce the chance of a type 1 error. As such, \* indicates  $p < .008$  (i.e.  $\alpha$  of .05 divided by  $N=6$  comparisons)

Table 3 shows a comparison of the results obtained after the workshop with those of the second posttest, which was filled in by student teachers who had completed the internship assignment. This did not yield any significant result, and it thus appears that student teachers' perceived competence for organizing IBL-activities underwent no further changes during the assignment.

The pre- and posttests also asked student teachers about the use of sources in the classroom. More specifically, student teachers had to indicate whether their students should mainly: (1) 'read and try to understand sources, which are meant to illustrate or complement the contents of the lesson' (understanding); (2) 'critically evaluate sources, using a number of criteria to determine which information is reliable and which is not' (evaluating); or (3) 'conduct stepwise investigations of sources, to reach their own conclusions through research questions and a thorough analysis of sources' (investigating).

On average, student teachers from the AT group appeared to hold different beliefs at the start of the intervention, compared to the NAT group. A multinomial logistic regression confirmed that there was a significant difference between the two groups ( $X^2=4.93$ ,  $p=.03$ ). In particular, the odds for preferring 'understanding' or 'evaluating', relative to 'investigating' were 3.88 times higher for the AT group. However, by the time the workshop was finished, this significant difference had disappeared ( $X^2=1.9$ ,  $p=.17$ ). An overview of the pre- and posttest results of each group can be found in Table 4.

**Table 4**

Student teachers' (N=50) preferred approach to using sources in class, prior to and after the workshop

use of sources	pretest		posttest 1	
	AT	NAT	AT	NAT
understanding	6	7	2	0
evaluating	12	6	4	3
investigating	5	14	17	24
<b>total</b>	23	27	23	27

Looking at the evolution in student teachers' beliefs about the use of sources, Figure 1 shows how 23 (out of 50) student teachers' beliefs about the use of sources in the classroom evolved from either 'understanding' or 'evaluating' to 'investigating'. However, it also seems that the workshop was unable to convince all student teachers, as 9 of them still chose 'understanding' or 'evaluating' when taking the posttest.

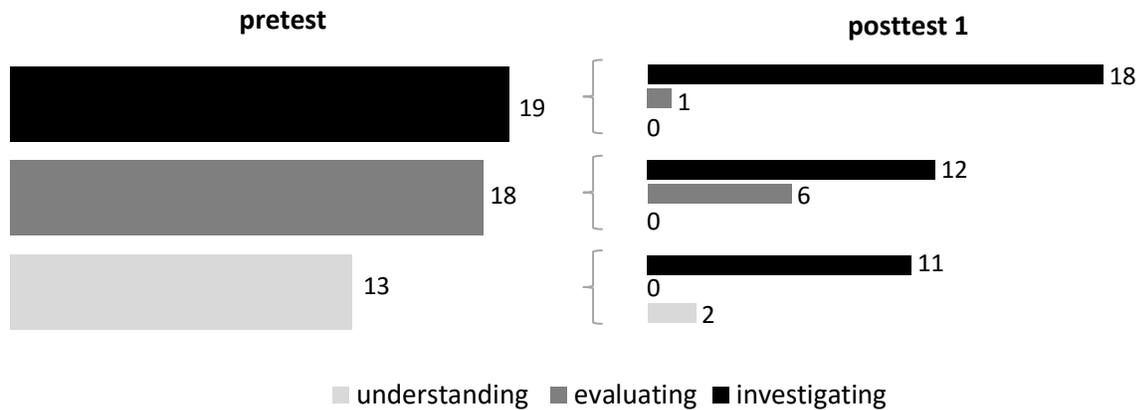


Figure 1. Evolution in student teachers' (N = 50) beliefs about the use of sources in class.

Further analysis suggests that most student teachers' beliefs changed again over the course of the assignment. Figure 2 shows the evolution in beliefs of student teachers who completed the internship assignment, and afterwards took part in the second posttest. This time, a large number of student teachers (N=18) who had selected 'investigating' during the first posttest, chose 'evaluating' or 'understanding' at the time of the second posttest.

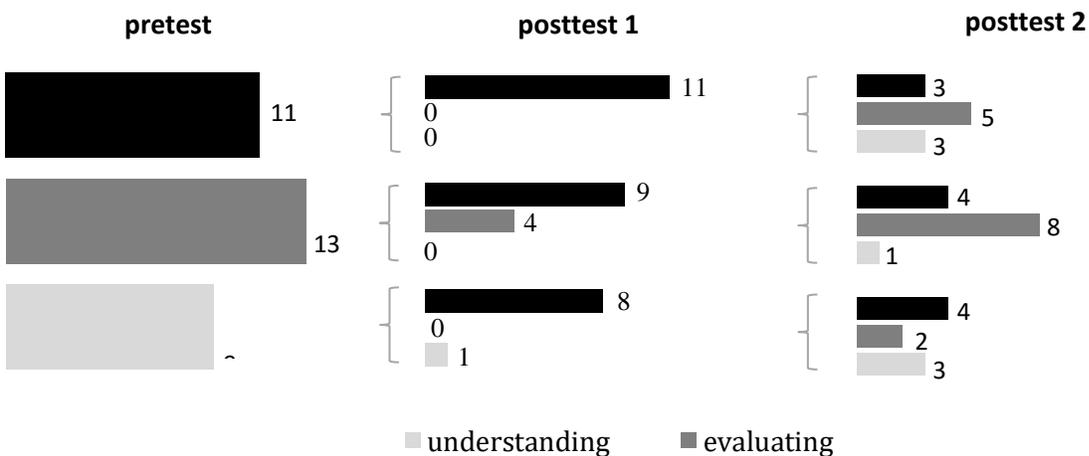


Figure 2. Further evolution in student teachers' (N = 33) beliefs about using sources in class.

#### 4.2. Lesson plans for the IBL-activity

Student teachers' lesson plans covered a variety of topics, both in terms of time and space, with examples like: Christianity in the Roman Empire, the power of medieval European kings, the Age

of Enlightenment, the downfall of the Chinese Empire, the rise of Fascism in Italy prior to World War II, the Israeli-Palestinian conflict, and the roots of Islamic fundamentalism.

Three templates were discovered across the lesson plans that were handed in by the students. Ordered from the template that least resembles the approach presented during the workshop to the one that most closely resembles it, these three are: fill in the blanks, synthesis, and critical inquiry. As Table 5 indicates, the main differences between these templates were related to the problem statement and required student activity. In what follows, the templates are further described and illustrated, using the representative cases of Marc, August and Cleo (pseudonyms).

**Table 5**

Overview of students' lesson templates

<b>lesson template</b>	<b>problem statement</b>	<b>student activity</b>
fill in the blanks	well-structured	knowledge telling
synthesis	ill-structured	knowledge telling
critical inquiry	ill-structured	knowledge transformation

In addition, Table 6 provides an overview of the extent to which each of these templates were found in lesson plans from the NAT and AT group, and in total. The differences between these two groups are rather small and, according to a multinomial logistic regression, not significant ( $X^2=.19$ ,  $p=.91$ ).

**Table 6**

Templates discovered across student teachers' (N=36) lesson plans.

<b>frequency</b>	<b>lesson template</b>					
	<b>fill in the blanks</b>		<b>synthesis</b>		<b>critical inquiry</b>	
	<b>N</b>	<b>rel. %</b>	<b>N</b>	<b>rel. %</b>	<b>N</b>	<b>rel. %</b>
NAT program	8	53	3	20	4	27
AT program	10	48	4	19	7	33
Total	18	50	7	19	11	31

#### 4.2.1. Fill in the blanks

A fill in the blanks lesson presents students with a well-structured problem, and is characterized by a focus on telling a particular story rather than to engage students in disciplinary thinking. It

bears a strong resemblance to a traditional, teacher-centered, storytelling approach, with the main difference that students can now go through the story at their own pace. As part of the preparation, the teacher selects a number of sources that correspond to the topics he or she would normally cover during a lesson. During the activity, students move from source to source and answer questions that correspond to the core of the story the teacher wants to impart. They are rarely confronted with sources containing contradictory information or different points of view, and are mainly required to retrieve information. In between each source, the teacher often provides students with additional information about parts of the story that are not covered by the sources. Sometimes, a fill in the blanks lesson literally takes the form of exercises where students have to discover and then fill in missing parts of the story. Given the well-structured nature of the problem, and focus on knowledge telling rather than knowledge transformation, fill in the blanks lessons can hardly be regarded as IBL.

<p>Vergelijk bovenstaande interviews en vul onderstaande tekst aan.</p> <p>In interview 1 toont dokter Turner dat hij ..... kinderarbeid is. Welke argumenten geeft hij hiervoor?          .....          .....          .....</p> <p>In het tweede interview is dokter Ward duidelijk ..... kinderarbeid. Wat zijn zijn belangrijkste argumenten? .....</p> <p>.....</p> <p>Beide interviews werden in 1819 afgenomen in het Britse parlement en werden voorafgegaan door een onderzoekscommissie zoals in het filmfragment uit Daens. De historicus Gijs De Boeck toont aan dat kinderarbeid in België pas veel later op de politieke agenda komt. In ..... wordt kinderarbeid verboden. Nochtans blijft kinderarbeid in de praktijk veel langer bestaan.</p> <p>"Afhankelijk van de wetgeving op .....</p>		<p>Compare the interviews above and complete the following text.</p> <p>In interview 1, doctor Turner shows that he is ..... child labor. Which arguments does he provide?          .....</p> <p>In the second interview, doctor Ward is clearly ..... child labor. What are his most important arguments? .....</p> <p>Both interviews were taken in 1819 in British Parliament and were preceded by a Committee of Inquiry, as in the fragment from the movie 'Daens'. Historian Gijs De Boeck has shown that it took much longer for child labor to make the political agenda in Belgium. In ....., child labor is no longer allowed. Yet, in reality, child labor stayed around much longer.</p>
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*Figure 3. Fill in the blanks lesson: case of Marc (original on the left and translation on the right).*

Marc was one of the student teachers who prepared a task that was identified as a fill in the blanks lesson. His inquiry focused on the working and living conditions in Belgian cities during the industrial revolution (19th century), and, as is typical for this template, spanned a multitude of topics, such as: working conditions in factories, changes in voting rights, and common people's

eating and drinking habits. During the inquiry, students moved from topic to topic, and were each time required to answer several questions that asked them to search for the correct information in the sources. For example, Figure 3 shows the questions that accompanied the topic of child labor. After students had completed this part, they moved on to the next topic of labor unions and voting rights.

#### 4.2.2. Synthesis

Synthesis lessons are based on an ill-structured problem, but, like the previous template, do not require a transformation of knowledge. In organizing this type of lesson, the teacher selects several sources that provide information about a specific topic, and then formulates a problem statement that requires students to create a synthesis of the information. These problem statements mainly ask students to report about what they have read, rather than to evaluate the information or form their own conclusions. In some cases, the sources are also accompanied by a number of clarifying questions that are aimed at helping students to find the most important information. Similar to the previous template, the lack of knowledge transformation means that synthesis lessons are not in line with the present study's view of IBL.

<p><b>ONDERZOEKSOPDRACHT</b></p> <p><u>Centrale onderzoeksvraag</u> : Hoe zag de Khmer-beschaving eruit?</p> <p>Een reconstructie aan de hand van het reisverslag van Zhou Daguan en de archeologische reliëfscènes in Angkor. (zie bronnenbundel)</p> <p><u>Deelvraag A</u>: Hoe aten de Khmer?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p><b>INQUIRY ASSIGNMENT</b></p> <p><u>Central research question</u>: <b>What did the Khmer society look like?</b></p> <p>A reconstruction based on Zhou Daguan's [a Chinese diplomat] report of his journey and scenes from archeological reliefs in Angkor (see your sources booklet).</p> <p><u>Sub-question A</u>: <b>How did the Khmer eat?</b></p>
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Figure 4. Synthesis lesson: case of August (original on the left and translation on the right).

August prepared a lesson that focused on the Khmer Empire during the Middle Ages. He selected a number of texts and images that came from two sources: 10 fragments from a book written by a Chinese emissary visiting the Empire at the end of the 13<sup>th</sup> century, and 7 pictures of bas-reliefs found at Angkor. Prior to the inquiry, August discussed both sources with the students, talking

about their creators, and the specific purposes they might have had in mind when creating these artifacts. Afterwards, students moved on to the inquiry task (also see Figure 4), and were asked to investigate a problem statement: 'What did the Khmer society look like?' In order to help students answer this mainly descriptive question, the teacher provided students with five, also descriptive, sub-questions, such as: 'What did the housing of the Khmer look like?' and 'How did the Khmer fight their wars?' The students were then instructed to study all of the sources and look for the answers.

#### *4.2.3. Critical inquiry.*

A critical inquiry lesson has its roots in an ill-structured problem that requires students to transform knowledge into arguments. In particular, students have to evaluate the available information to form their own conclusions, and then use it as evidence to support their ideas. Although a critical inquiry is thus generally based on an evaluative problem statement (i.e. asking students for a personal judgement), the presence of an evaluative problem statement does, however, not automatically result in a critical inquiry. For instance, a task may well start with an evaluative problem statement, but becomes a fill in the blanks or synthesis lesson when it mainly requires students to look up bits of information supporting one specific claim. In a critical inquiry lesson, the sources selected by the teacher generally offer different perspectives on the topic under investigation. As a result, students cannot simply retrieve the right answer from the information they receive as part of the inquiry. Similar to synthesis lessons, the sources are often accompanied by a number of questions that point students toward important information or a critical reflection on the nature of this information.

The IBL-activity prepared by Cleo is a good example of a critical inquiry lesson. Cleo created an inquiry on the medieval crusades in Europe, and asked students to think about a problem statement that was clearly evaluative in nature: "What were the two most important motives of the crusaders?" Students received a booklet of sources that presented different perspectives on the problem statement (e.g. covering themes such as religion, trade, land, wealth, and freedom), together with a number of questions for each source. To illustrate this, Figure 5 shows the questions accompanying a source with Pope Urban II's call to join the crusades. These questions prompted students to try to imagine the historical context, and think about the impact this speech would have had at the time. Students were then again pointed toward the problem statement, and instructed to reconsider their conclusions based on this new information, something they had to do each time after having studied a new source. At the end of the inquiry, students had to report their findings and were informed that: "This is a personal interpretation, which can differ

from that of other people. Please keep in mind that the participants in the crusades were very diverse. Also: (1) support your own opinion, explain why you think something, (2) always mention where you got the information and how trustworthy it is, and (3) try to think about counterarguments that someone else might give, and attempt to counter those in your report.”

<p><b>3. RELIGIEUZE MOTIEVEN</b></p> <p>Bron. Deus lo volt!</p> <p>? Vind je dit een overtuigende oproep voor gelovigen? .....</p> <p>.....</p> <p>? Kiezen ze kruisvaarders zelf of ze mee willen? (vul zowel bij ja als nee iets aan)</p> <p>Ja want, .....</p> <p>Nee want, .....</p> <p>? Er zitten twee motieven in deze tekst. Door mee te gaan op kruistocht doet men een gunst aan ...</p> <p>1. "Onze broeders": .....</p> <p>2. Zichzelf: .....</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Jouw tussentijdse conclusie(s) (herlees de probleemstelling):</p> </div>	<p><b>3. RELIGIOUS MOTIVES</b></p> <p>Source. Deus lo volt [God wills it]!</p> <p>? Do you think that this call is convincing to religious people? .....</p> <p>? Do the crusaders have any choice in joining? (complete both yes and no)</p> <p>Yes, because.....</p> <p>No, because.....</p> <p>? There are two motives in this text. By joining the crusade, one lends a favor to...</p> <p>1. "Our brothers":.....</p> <p>.....</p> <p>Your preliminary conclusion(s) (re-read the problem statement ) :</p>
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Figure 5. Critical inquiry lesson: case of Cleo (original on the left and translation on the right).

### 4.3. Student teachers' thoughts about the IBL-activity

As Table 7 illustrates, differences in student teachers' approach to the IBL-activity do not seem to be connected to their beliefs about the use of sources in class, as measured right after the end of the workshop. No clear pattern can be derived from the data, as most of the teachers indicated that they wanted to conduct full-scale investigations with sources, but later created lessons that corresponded to different templates.

An analysis of student teachers' reflection papers, as well as the interviews that most of them participated in, was therefore conducted to find out more about what might have caused these differences. From this analysis, there emerged three main themes related to student teachers' general experiences with organizing an inquiry. In addition, several cases suggest that differences between student teachers' lesson templates do not seem to have been merely a matter of limited experience with organizing IBL, but likely also one of influences associated with

the context of teaching. The cases of Marc, August and Cleo are again used to illustrate this finding.

**Table 7**

Student teachers' (N=32) preferences for using sources (post-workshop) and lesson templates.

use of sources	lesson template		
	fill in the blanks	synthesis	critical inquiry
understanding	1	0	0
evaluating	0	2	3
investigating	16	3	7

#### 4.3.1. General experiences

A topic that was noted by most student teachers was how the inquiry changed both teacher and student roles during the lesson. As one student teacher put it: "Students finally have to do something themselves, while you, as a teacher, have to do something other than classic teaching. You become more of a guide, enter into a dialogue with students, and go into the classroom among them. This enables you to interact on a more personal basis with the students, and you can spot problems more quickly." Overall, student teachers were positive about this change of roles, and described the IBL-activity as a more 'relaxed' approach to teaching. With a few exceptions, most did not seem to have felt uncomfortable in walking around the classroom, instead of directly teaching the whole group of students. Although none of the student teachers reported major problems, several did have some difficulties with the practicalities of their new role. For example, one of them reported how: "I focused all of my attention on student groups that asked a lot of questions, but now I realize those were actually the groups that were doing the task really well.", while another stated that: "When I was helping or answering questions, it was often difficult not to give the right answer away. I tried to avoid doing so, but sometimes I still caught myself saying too much."

Apparently, not all student groups were familiar with IBL, as became clear from one student teacher's report of how he overheard his students whispering: "And they are paying him to teach us." Still, students' reactions to the IBL-activity seemed to have been mainly positive, with student teachers describing their students as 'very enthusiastic', 'working diligently', 'enjoying the assignment', and 'all seeming in favor [of IBL]'. In particular, some student teachers were pleasantly surprised when they tried out the activity in classes that were known as 'tough crowds'.

One of them reported that: “the first class in which I tried out the lesson was known as the worst class in school, with a rude and arrogant attitude toward the teacher, and a lack of cooperation. [...] This was one of the few moments that these students were not disturbing the lesson, and really involved with the lesson contents.” Similarly, another student teacher noted that: “[During the previous lessons] I had noticed quite a few times that the students really tried to test me, by talking out loud, sighing, and reacting provocatively. [...] Contrary to my expectations, I had no problems with classroom management. It was quite the opposite, with concentration and participation being higher than during the traditional lessons I had taught so far. [...] This may indicate that IBL and doing their own source work were a better fit for these students than direct instruction. The personal contact with the teacher, which is characteristic to this approach, also seemed to have been more agreeable to these students.” Only in a few cases did students not seem eager to work on the inquiry. In the first, the student teacher believed that this was mainly due to the lack of a captivating introduction, as time constraints forced her to start the inquiry straight away. In the other, the reason unfortunately remains unclear.

Preparing the IBL-activity proved to be the most difficult part for most student teachers. This first of all seemed to take up a lot more time compared to other lessons. One student teacher explained that: “Not only do you have to find a series of sources that students can understand and use to answer a problem statement, but you also have to think about the practical organization, make source booklets and questions, and write out the instructions.” However, the work did not seem to stop there, as another wrote that: “It is really an approach that requires a lot of time: before the lesson (preparation), during the lesson (spending a lot of time on something that you yourself could explain more quickly) and after the lesson (reading over students’ work).” In addition, student teachers often had problems with finding ‘good’ sources, estimating how difficult these documents would be for students, and how much time it would take students to work through them. For instance, one student reported that he quickly realized that not all topics were equally suited for an inquiry: “because, in my opinion, there was not much information available, and especially information that was on students’ level.” According to another student teacher, the main problem was that: “You can use a lot of materials to talk about the topic, but it is not evident to let students work with them if they don’t have the necessary background knowledge.”

#### *4.3.2. Influences of the teaching context*

Looking further into what might have caused student teachers to have taken different approaches toward the IBL-activity, the focus again returns to the cases of Marc, August, and Cleo. These

teachers were selected because they chose different lesson templates, even though they had all indicated after the workshop that they wanted their students to ‘conduct stepwise investigations of sources, to reach their own conclusions through research questions and a thorough analysis of sources’ (*investigating*). Their accounts indicate that student teachers’ work on the task was in part influenced by the context of the teaching internship, and are mainly used to illustrate the interactions between student teachers and their working environment. By no means does this mean that all student teachers who chose the same template did so for similar reasons, as student teachers may cope with contextual influences in different ways, and different combinations of beliefs and influences may underlie the choice for a particular lesson template.

In the reflection that followed his fill in the blanks lesson, Marc reported that: “I have my doubts about students’ mastery of the content during these inquiry lessons. During the interview, he further explained that: “I think my main reason for choosing this approach was that I wanted them to be able to learn the content. [...] Because it has more structure, and because the story is clear, that is why I chose it.” Marc thus chose this template because he believed that, otherwise, his students would not have a clear overview of the content after the lesson had ended. Although he appeared to have some doubts about students’ ability to engage in historical thinking, this ultimately did not appear to be the main reason for his choice: “I don’t know whether students are able to grasp the complexity of history, and whether they could do so during an inquiry. They probably would [be able to do it]...” As he later explained, it was mainly the mentor teacher’s focus on covering the content that drove him to this decision: “I had received the lesson contents from my mentor in advance and then I... During my internship, they expected me to cover those contents, so it was not easy to organize an inquiry about just one topic.”

Moving on to the second case, August’s reflection on his synthesis lesson contained the puzzling statement that: “The assignment sticks to making a synthesis of the information that can be found in the sources. It was not my intention to achieve a higher level of inquiry competences with these students.” When asked to further explain this during the interview, he replied that: “I was expecting you to comment upon that”, indicating that he was well aware that his lesson was not completely in line with the contents of the workshop. The reason for his choice for this particular template did not appear to lie with his mentor, as he stated that: “My mentor teacher was relatively young, she had graduated about four years ago. [...] She was really open [to inquiry], and she used it herself, so...” Instead, August seemed to have significant doubts about the disciplinary thinking skills of the students in his internship classroom: “I really agree with everything you said [...], but I rather see it as a growing process. [...] They really need more training

in learning to describe what they see, in relation to a historical question. They will be required to construct their own questions and make their own evaluations later on.”

Finally, Cleo took a clear stance in the design of her critical inquiry, and wrote in her reflection paper that: “Learning to correctly apply ‘the historical method’ is not my central focus. They [students] are not academics, nor should they become judges of historical facts. Instead, I mainly want them, through collaboration, to experience the subjectivity and multiperspectivity of history, with a healthy dose of discussion.” Even though Cleo also appeared to have her doubts about students’ ability, she seemed to have found a way around it: “Because I put a lot of structure in the source booklets for these young students of the third grade, almost everything went according to plan. I put a great deal of effort into making sure that the objectives were clear and logical, so that students always knew what was expected of them.” She also noted how, during the inquiry, she went around the classroom and tried to keep her students’ motivation high: “I spent much of my time on positive reinforcement, which clearly had a lot of effect. [...] Through much feedback in between, so that they know they are proceeding in the right direction, or with a simple ‘well done’ after checking part of their work, even when you have just suggested a number of changes. “

## **5. DISCUSSION AND CONCLUSION**

The present study explores the effects of a pre-service teacher training on inquiry-based learning (IBL) in history education. This introductory training consisted of a workshop and an assignment that required student teachers to prepare and implement an IBL-activity during their teaching internship.

Looking first at the quantitative analysis of the training, the results indicate that student teachers found the workshop valuable, and afterwards felt significantly more capable to organize IBL-activities in the classroom. This significant effect is particularly important, as previous research has indicated that teachers’ self-efficacy is a predictor of the extent to which they will ultimately implement IBL in their classroom (Voet & De Wever, 2017). The workshop was also able to convince student teachers of the value of IBL. After its ending, almost all participants indicated that they mainly wanted to use sources for conducting full-scale investigations, whereas, previously, about half of them had held a different opinion. An explanation as to why the workshop had this effect may be found in its design principles. Next to stimulating active learning, the program was specifically designed to change student teachers’ attitude toward IBL, and provide them with a practical guide necessary for organizing such activities. These design principles, which complement those unearthed by earlier work (e.g. Levy et al., 2013), therefore

appear to provide a good starting point for the development of training initiatives for stimulating (student) teachers to adopt IBL into their teaching repertoire.

Similar to previous studies (Barton & Levstik, 2003; McDiarmid, 1994) the results also warn educators not to assume that student teachers with a strong knowledge of history and its methods of inquiry will be more inclined to teach these topics to their students. On the contrary, it appears that students from the AT program, who had previously obtained an academic degree of master in history, were less inclined to conduct full-scale investigations with sources in their classrooms, compared to non-academic students from the NAT program. Although teachers' knowledge of history influences the way they organize their inquiry activities (McCrum, 2013; Voet & De Wever, 2016), the present study appears to confirm that beliefs about teaching and learning history develop relatively separately from this knowledge (McDiarmid, 1994).

Moving on to the data that were gathered after student teachers had completed the assignment, the analysis indicates that their perceived competence for organizing IBL did not change over the course of their teaching internship. In contrast, there was again an important change in student teachers' beliefs about the use of sources. Whereas most of them had, at the end of the workshop, indicated that they wanted to conduct full-scale investigations, they now reported that they mainly wanted to use sources to provide additional information about a topic, or to teach their students how to assess the reliability of information. It thus appears that the internship, which confronted student teachers with the reality of the classroom, caused them to reconsider their beliefs. This finding echoes those of previous work (e.g. Fehn & Koeppen, 1998), which suggests that the context of teaching internships may discourage student teachers from trying out innovative methods for teaching history.

The qualitative data help to shed more light on this issue. An analysis of student teachers' lesson plans revealed three different lesson templates, of which the third is the closest match to the approach presented during the workshop: fill in the blanks, synthesis, and critical inquiry. The main differences between these approaches are related to the (1) problem statement (see King & Kitchener, 1994), and (2) required student activity (see Wiley & Voss, 1996). In short, a fill in the blanks lesson is based on a well-structured problem, asking students to retrieve parts of a particular story, whereas the other two templates draw on ill-structured problems to which there are no clear-cut answers. However, unlike critical inquiry lessons, synthesis lessons do not require a transformation of knowledge from sources into arguments.

When considering what may have caused student teachers to select different templates, the reflection papers and interviews suggest that at least a part of the differences can be connected to the contextual influences that student teachers experienced during their internship. In line

with previous research (Crawford, 2007), it was found that the teaching context generally imposed a number of constraints to IBL, related to, for example, mentor teacher requirements or students' ability to engage in historical thinking. Furthermore, student teachers noted that the preparation of IBL-activities proved to be more challenging compared to traditional lessons. Similar to what Levy et al. (2013) found, the biggest hurdle to organizing an IBL-activity was to find the 'right' sources, by which student teachers meant sources that: contained the relevant information, complemented each other, and could be easily adapted to students' level. Several student teachers therefore reported that organizing the inquiry had taken considerably more time and effort than they normally spent on lesson planning. In short, the combination of contextual constraints and higher workload may help to explain why student teachers selected different lesson templates, but also why a significant number of them were less predisposed toward organizing classroom investigations after their teaching internship had ended.

Even so, an important limitation of the present study is that the relative impact of each of these influences on student teachers' thinking remains somewhat unclear. Making generalizations is difficult, as student teachers worked in varying contexts, which imposed different mixtures of constraints, and seemingly coped with difficulties in different ways. Another limitation is that it is not clear why, before the training took place, dispositions toward IBL differed between the NAT and AT student groups. Although this did not impact the present study, as student groups no longer differed after the training, it is still puzzling why academically trained teachers were initially less inclined to organize IBL-activities. One possible explanation is offered by previous research (Voet & De Wever, 2017), which found that academically trained history teachers' rated students' competence for IBL significantly lower than their non-academically trained counterparts. These teachers might thus have been less inclined to organize IBL-activities, because they were less likely to think that students might be able to engage in reasoning with historical information. On the other hand, there might also be an influence of the teacher training program at work here. Even though both student groups had little experience with IBL, their predisposition toward this teaching approach may still have been influenced by differences between the two programs' curricula. Future research is therefore required to provide more clarity as to what may have caused this difference. Finally, a last limitation is that, due to various reasons, a number of student teachers (18 out of 54) dropped out over the course of the training program. Although the number of remaining teachers was sufficient to evaluate the outcomes of the training program, the question remains how these drop-outs would have performed on the assignment.

To summarize, the results demonstrate that even short training programs hold considerable potential for encouraging student teachers to implement IBL. However, the results also suggest that a confrontation with the constraints presented by the actual teaching context, together with a higher workload associated with IBL, can negatively influence some student teachers' thinking about IBL. These findings hold a number of implications for teacher education programs, both in terms of practice and future research.

## **6. IMPLICATIONS**

Building on previous work examining teacher training on inquiry-based learning (IBL) in history education (Levy et al., 2013), the present study offers three design principles to teacher educators who aim to encourage the adoption of inquiry-based learning (IBL) into student teachers' arsenal of teaching methods. The results indicate that a training focusing on (1) stimulating active learning, (2) changing beliefs, and (3) providing a practical guide results in a positive effect on student teachers' attitudes toward IBL, and their perceived competence for organizing such activities. Although one may assume that the second design principle is irrelevant for student teachers who already have a strong background in history, the results of the study suggest that student teachers' beliefs about teaching and learning history actually develop relatively separate from their knowledge of disciplinary thinking.

In addition, the results suggest that challenges associated with putting IBL into practice may dissuade student teachers from further experimenting with this innovative approach. Extended support during the implementation of IBL in class therefore seems necessary, in order to overcome possible negative influences of contextual constraints and a higher workload on student teachers' thinking. A first approach could be to carefully select the mentor teachers that support student teachers during their first forays into practice. As Abell, Dillon, Hopkins, McInerney and O'Brien (1995) note, one of the roles that mentor teachers play to student teachers is that of a scaffolder, who uses his knowledge and experience to help solve classroom problems. To be able to do this, however, mentor teachers not only need to be supportive of IBL, but also have a strong knowledge base with regard to this teaching approach. In cases where it is not possible to make such a selection, another approach could be to plan regular follow-up activities within the teacher training program. Multiple opportunities for practice, alternated with practical support and feedback that prompts reflection on student teachers' work and beliefs, may also help to consolidate the effects of a training on IBL. More specifically, the present study's framework of two task dimensions (i.e. problem statement and student activity), and the resulting

three lesson templates (i.e. fill in the blanks, synthesis, and critical inquiry), can act as a tool for helping student teachers to think about their own work.

The result of the study emphasize that it is important for future research to further investigate what happens after a training on IBL. More information is needed about how student teachers' first attempts at implementing IBL in class influence their work and beliefs, and how extended support provided by either the mentor teacher or teacher education program may impact this process. In particular, longitudinal studies could provide more information on the long-term effects of a training program on IBL, after student teachers have graduated and entered into practice.

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## 8. APPENDIX A: INSTRUCTIONS FOR THE REFLECTION PAPERS

### 8.1. Assignment 1

For this assignment, you are asked to reflect on your **approach to the preparation** of the IBL activity during your teaching internship. **Shortly after** having completed your lesson plan, you are asked to write a report in which you provide an answer to the following 2 main questions:

(1) *What did you do as a part of your preparation? Through which steps did your work proceed?*

The objective is **not** to copy the approach presented during the workshop, but to give a step-by-step description of how **you** tackled the assignment. Be clear: give a sufficiently thorough report of what you did and why (e.g. not: "I made instructions for the students and printed them", but rather: "I chose to let students work together in dyads, and asked them to assume and switch between roles of 'summarizer' and 'critic', because I think this is something they

will not do spontaneously”). Do not be afraid to be honest: you will not get a negative evaluation if your own approach differs from the one presented during the workshop. This part has to be **at least 1 page** in length.

(2) *What went well, and what proved to be a challenge? How do you explain this?*

Try to maintain a **balance** between positive and negative experiences: in other words, report the things that went well, but also those that did not go so well. Be clear about what exactly you thought was easy or hard, and, above all, try to explain why you think so (e.g. not: “I thought it was hard to make instructions”, but rather “when making instructions, I was not sure whether to design roles or a step-by-step plan, because both have their respective advantages). This part has to be **at least 1 page** in length.

Please hand in this assignment **no later than 7 days** after having completed your lesson plan.

## 8.2. Assignment 2

For this assignment, you are asked to reflect on **the actual implementation** of the IBL activity during your teaching internship, as well as **your own approach** to this activity. **Shortly after** having finished the lesson in your classroom, you are asked to write a report in which you provide an answer to the following 2 main questions:

(1) *How did the lesson go? What went according to plan, what did not, and why?*

Give, **for each phase of the lesson**, a description of how the learning activities turned out. Try to focus on what went well, or things that posed a challenge to the students or yourself. Also, try to explain why you think this was the case (e.g. not: “The part where the students had to read through the information did not go well”, but rather “I had a feeling that the students were not really motivated to go through the information. I had noticed earlier that there was not much enthusiasm for my introduction of the topic, so that might have been the cause. Maybe I should have given a different introduction, for example by...” This part has to be **at least 1 page** in length.

(2) *What are your experiences with this approach to teaching and what did you learn? What is your final conclusion?*

Write a **conclusive reflection** in which you focus on your experiences during the workshop, but also the preparation and implementation of the lesson. What has remained stuck in your memory and why? What did you learn, and what topics would you like to learn more about? How did teaching this lesson feel, compared to other lessons you taught during your teaching

internship? End with a **general conclusion** in which you clarify whether you still want to use this approach to teaching (or certain elements of it) in your future lessons and why (not). Again, do not be afraid to give your honest opinion: you will not receive a negative evaluation if you feel that this approach to teaching does not suit you. This part has to be **at least 1 page** in length.

Please hand in this assignment **no later than 7 days** after having completed the lesson in your classroom.