

A Tale of Two Thresholds*

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Abstract

Our study follows the work produced by pre-service teachers in six of our required history seminars to analyse how their ideas about "what good historians do" and "what good history teachers do" changed over the semester. These pre-service teachers need to pass through two portals in their thinking: one, to develop a less novice-like understanding of how history functions as a discipline and, two, to move away from seeing their role as purveyors of single-stranded narratives that students should memorize, so that as teachers they can engage in teaching historical thinking. Through both a qualitative and quantitative analysis of the 62 pre and post surveys, and their final papers (a lesson plan), we found that students' performance in their lesson plans was more closely correlated with their ability to articulate what historians do than it was with their ability to articulate what history teachers do. Indeed, statistical correlation was high. These finding suggests that teaching history and knowing the ways of thinking of this discipline are inseparable in the shaping of an effective history teacher, and that pre-service teachers must pass through the disciplinary portal before they can teach historical thinking to anyone else.

Keywords: History education, teacher training, historical thinking, learning bottlenecks, threshold concepts

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Background

Recently one of our students, a pre-service teacher, apologized for rowdiness in class when the students were filling out their course evaluations. She explained that the students liked the course, but they didn't see why they had to take history seminars in which they wrote history papers, because they weren't planning to become historians, just Social Studies teachers. The seminar in question, offered in the history department specifically for students pursuing education certification, is intended to prepare these students for the advanced seminar they take alongside history majors, but also to link historical content and skills with readings about historical thinking and history pedagogy. But the question the students asked suggests that they did not fully grasp the connection between what was going on in the history classes they took and their role as future teachers. While it is certainly true that these students may never publish historical work of their own, they will be expected to teach their students how to think historically, that is, to do history themselves. These teachers, however, see "learning history" as something different from "doing history."

There is (naturally!) a history to this cognitive disjuncture in the United States. High school teachers in the United States in the 1920s adopted the term "Social Studies" to describe what they taught, as part of a "general movement to relate school programs to the problems and activities of contemporary life." (Thornton 2001, 192-3) History was therefore reduced to a base of facts to be deployed by other more relevant disciplines; because it was not in itself a useful object of study, teachers no longer felt it necessary to teach with historical sources. Indeed it was not required for them to take college history courses to teach history. (Orrill & Shapiro 2005, 745) This trend continues in American education; many teachers use only a textbook to teach history in high school and consequently few high school students have encountered historical study as an analytical practice. (Barton & Levstik 2004, 252ff.) When at the beginning of our program we ask our pre-service teachers why high school students should study history, most fall back on conventional wisdom—so that past mistakes will not be repeated or some variant on better understanding the present through knowing how it came to be. This is the Social Studies rationale: that history exists for direct application (or else it is no use at all). But also implicit in this reasoning is a notion of history as a single-stranded narrative, which students are to memorize, an idea profoundly at odds with how historians see their discipline.

One might expect that our pre-service teachers would already have found their novice notions challenged by university history studies: The students in our program have typically taken at least four history courses before they take ours. However, in practice, college-level history instruction seems to shift students away from novice notions about the discipline less than one might expect. This is not true only for history, of course. The physicist Carl Wieman (2006) has noted the same issue with physics education; introductory courses made students more novice-like, a quality they had not shed by the time they entered graduate programs in physics. For one thing, there is an apparent continuity of instruction between high school and college. When history in American colleges is taught by lecture, students can continue to assume that their job is to memorize and to tell what happened rather than to explain or analyze. Teachers may model historical analysis for their students, but their students may not recognize that this is happening unless the modeling is explicit. (Díaz et al. 2008) Furthermore, students, particularly in large classes, have limited opportunities to practice the skills being modeled until they begin to take research seminars, the signature pedagogy of history, which typically happens at the end of their programs. (On signature pedagogies in history, see Sipress and Voelker [2009]. If the signature pedagogy is the pedagogy most characteristic of the discipline and the place where students really learn to function in the discipline, however, the research seminar would seem to be the historical signature pedagogy, which in its fullest form, students encounter only in graduate school. But if one takes a less severe look at the issue and does not restrict one's discussion to a type of class, but perhaps a method of proceeding, then a class in which students "do" history rather than "appreciate" history might be said to be a manifestation of the signature pedagogy. That might be the "argument-based" class suggested by Sipress and Voelker [2011] or the problem-based course suggested by Lendol Calder [2006].)

History students also do not generally recognize their teachers as contributors to historical discourse, creators of history. A small study done by graduate students in our History department found that our undergraduate students were generally unaware that their teachers were practicing historians. (Blizard et al. 2013) While disappointing, these results are not surprising or atypical. Martin and Monte-Sano (2008, 178) reported, although the participants in their teacher-training program had undergraduate history degrees from good universities, they did not think historically very well.

Students in our program, therefore, need to pass through two portals in their thinking. First, they need to develop a less novice-like understanding of how history functions as a discipline, to move from seeing history as a fixed, single-stranded narrative created by historians gathering indisputable facts to seeing history as something created by historians as part of a contested intellectual discourse in which narratives and perspectives simultaneously satisfy disciplinary notions of truth and are in competition with each other. Second, they must also move away from seeing history teachers as purveyors of these single-stranded narratives to students, who must memorize them, toward a richer understanding of the teacher's role: teaching the moves of historical thinking to their students and giving those students an opportunity to practice them at a junior level. (On "junior versions" see Perkins 2008) However, our pre-service teachers will not be able to do the latter, if they have not mastered the former conception and if they themselves have never successfully engaged in disciplinary thinking. It is particularly crucial that American Social Studies teachers know how to think historically, because they are increasingly likely to teach courses in high school for which students are awarded college credit, whether through Advanced Placement courses or early college high school courses, in other words, courses otherwise taught at the university level by individuals with graduate training in history.

The Study

Our study follows six classes of pre-service teachers taking the first of the two required history seminars to see how their ideas about each of these thresholds changed over the semester. As part of the coursework for completing a teaching degree in secondary education in the Social Studies, students are required to take at least ten history courses (the same number as a history major), including in a seminar especially for them, J301, followed by a second seminar, J400, also required of history majors. The J301 seminar is offered on variable topics reflecting the interests and expertise of the instructors. This data comes from classes taught by the two of us, although some other instructors have also taught these courses; Díaz's topic for the course was "Latinos beyond the Textbook," while Shopkow taught on two topics: "World History on the Fly" and "Microhistory." Both of us are among the founding directors of the History Learning Project, which uses the Decoding the Disciplines methodology to analyze "stuck places" (bottlenecks in Decoding terminology, some of which correspond to threshold concepts)

and our seminars are intended to help students negotiate these bottlenecks or thresholds. (Shopkow 2013; Pace & Middendorf 2004) Although each of us focuses in our class on somewhat different epistemological bottlenecks students face—the issue of multiple perspectives when teaching US and Latino history in the case of Díaz, using primary sources as gateways to historical analysis in Shopkow’s case—both of us recognize that the necessary moves we teach students are part of the higher-order threshold concept that is the nature of the historical discipline. (See Entwistle 2008) Decoding has helped us both break down the larger epistemic regime into its constituent parts and also to see more clearly how these parts fit together as a whole. (Shopkow 2013)

But are students really negotiating these two portals successfully, and if so, in what manner? From 2012 on we have collected data on our students systematically. In each of the classes student work culminates in a lesson plan designed for high school students which must involve some sort of historical thinking that demonstrates an understanding and application of some of the mental moves and disciplinary rules that are used in the production of historical knowledge. Some common examples of historical thinking in these lesson included switching perspective, reading historical accounts, and producing claims based on evidence. (Lévesque, 2008) In addition we have surveyed students about their ideas concerning the role of historians, history teachers, history students, and the purpose of studying history at both the beginning and the end of the semester. We thus have six semesters of survey data, with sixty-two complete surveys (both pre- and posttests). The complete surveys include all students who began the courses on the first day and completed the courses; we are not considering surveys in which we have only a pretest or only a posttest. These surveys represent about three-quarters of the students enrolled in these classes at any point during their respective semesters. Until academic year 2013-14, the students were also simultaneously enrolled in Block I of their Social Studies program, but in that year, J301 was decoupled from the Block, which meant that the backgrounds of the students were more variable than in previous years. Finally, we have also individually collected additional data from our students, Díaz using a quantitative survey developed by the History Learning Project (Shopkow 2013, 29-30), while Shopkow added an additional question to the post-course survey, asking whether and how student’s ideas about history had changed.

The Survey

For the purposes of this paper, we consider only two questions from the pre- and posttest surveys. We see the first—“What do good historians do?”—as a proxy for student understanding of the nature of history. The second question, “What do good history teachers do?” elicits student notions of what their responsibilities as teachers would be. The students can address almost any aspect of the question as there are no further prompts. The form provides them with six lines ruled about 37mm apart, so that the answers are necessarily limited in length, although at least in the initial surveys, few students used all of the available space. They were more likely to fill in the space in the end-of-semester survey.

To turn the qualitative data into something loosely quantifiable, we coded the answers based on how sophisticated the students’ answers were, sorting the answers into low, medium, and high categories in relation to their comprehension and assigning each a numeric value between 1 and 3, with half-point increments. To keep our answers as consistent as possible, we listed the attributes of each category in a rubric, which we consulted as we assigned values, and both of us coded the data. For the first question, “What do good historians do?” a student answer would be characterized as having a low-level conception if the student merely said that historians investigate the past or look for true answers or take an unbiased approach to the past, describe the past, or tell stories about the past. While these assertions are certainly correct—although the notion of bias is a complicated one in history and therefore needs some unpacking—this is not a very sophisticated way of describing what historians actually do. Below is a typical answer of this type:

Good historians are supposed to find the truth and the things hidden by time. They should dig and pry to find things that have been forgotten. (Pre-test answer, Student, Spring 2013)

This answer suggests that history exists outside of the historian somehow, and that the historian merely needs to dig it out, like a potsherd out of the sand. Thus sources in history are “decontextualized, disembodied authorless forms of neutral information that fall ready made out of the sky” where the past and history are the same thing and where the voice or choices of the investigator do not exist. (VanSledright & Reddy 2014, 34) If this is all that a student thinks about the historian’s task, he or she is lining up with what

Peter Seixas (2000, 21ff) has described as history as collective memory, a sort of “best story” told about the past.

A more sophisticated sort of answer (medium) might stress that historians have to dig deeply or search widely for evidence; report that historians need to put their ideas into an historical context (although without further explanation); argue that historians should consider multiple perspectives (again without clarifying what this means); suggest that historians needed to make connections across time and space or to explain why things happened; remark that historians should put themselves in the shoes of past peoples (without further clarification of what this means); or stipulate that historians evaluate their sources for validity. These answers, which acknowledge the historical investigator’s role in the production of knowledge, are characterized as being of medium sophistication not because they are not correct, but because they are incomplete or unspecific. One such answer is this:

Study history with an open mind. Compare and contrast evidence, as well as the present with the past. To use evidence such as pictures, writings, and more to determine the lifestyles of people in the past. Then share their knowledge in books and papers, so [people] might learn.
(Pretest answer, Student, Fall 2012)

This answer implies that historians need to be prepared for evidence to contradict their expectations—hence the necessity for an open mind—; that they need to draw on many types of sources; and that people in the past probably were different from people in the present (although the reference to lifestyles elides the issue of differences of perspective). These sorts of answers fit fairly well with what Seixas (2000, 24) calls “disciplined knowledge”; even some professional historians operate at a level no different from this and a student who grasps these points thoroughly and is able to put them into effect is capable of doing good historical work.

The most historically sophisticated answers depict historians deploying evidence to offer an interpretation of the past; recognize that historians need to evaluate historical sources for more than their factual validity; realize that historians actually construct history through the process of making claims; underline the importance of taking the perspective of historical sources (sometimes also referred to as historical empathy); and reference the historian’s own positionality and how this might affect interpretations. The

students who gave these answers knew they had to construct historical context for themselves based on primary and secondary sources that reflect diverse perspectives. This epistemic position views knowledge as actively constructed by the historical investigator and connects the role of the knower with the past that is to be known or understood. (VanSledright & Reddy 2014, 35) An example of such an answer appears below.

Good historians take all accounts into consideration when reading history. History is not one story, history revolves around different perspectives, positions and circumstances. A good historian digs for evidence that not only tells what happened, but who it involved, why they were involved, how they [were] affected, the results of the situation (globally), and the author's positionality. (Posttest answer, Student, Spring 2012)

While some of these characteristics fit with Seixas's notion of "disciplined knowledge," mostly these characteristics point to his description of post-modern history, namely that history is always presented from a perspective, that the historian is always a factor in the history he or she creates, and that therefore conflict between interpretations of the past is inevitable. The goal of the historian is not to resolve such conflicts—they may not be resolvable as they arise from different epistemic communities—but to understand their genesis. (Seixas 2000, 26ff.)

We rated the responses to what good history teachers do in the same way. Here the issues were a little different. For one thing, we were looking primarily for pedagogical content knowledge, not only knowledge of the specific content of history, but how this might best be taught. (Shulman 1986) By implication, a more sophisticated understanding of the nature of history as a discipline should lead to a shift in the respondents' notion of the appropriate pedagogy to teach it. However, students sometimes gave answers that while appropriate, didn't address this issue, such as that teachers should motivate their students or be passionate about their subject or know a lot of content. These things are useful and true, but not really specific to history. Otherwise, we rated their understanding of their role as conceptually low if they emphasized that history teachers should help students memorize or that they should present an unbiased or true view of the past or "cover" the past. We also counted their responses as being low conceptually if they mentioned that a teacher's purpose was to prepare students for civic participation without any mention of the way history teaching was to do this. Civic participation was an important theme in answers given by Block I

students, because Keith Barton designed the curriculum they follow, and they are reflecting the ideas advanced in Barton and Levstik (2004). What Barton and Levstik mean, however, is not that some historical knowledge is necessary for the citizen, that is, that they should know the Bill of Rights, for example, but that to be a citizen in a democracy means having to evaluate claims based on evidence. These claims are often historical in nature, such as the claim of the American Tea Party to represent an American tradition of freedom. In other words, history is deeply embedded in how modern societies see themselves (see Davies 2006), so that to be politically engaged means negotiating historical claims. These criteria correspond to the unsophisticated notions students have about what historians do, in that they emphasize factual content and the role of the teacher as transmitter and do not see any role for teachers as mediators of contested material. This response was typical of this low-level conception of the role of teachers:

Take the conclusions that historians have arrived at, simplify the conclusions to the level of their students, and then proceed to have their students interact with this information. (Pretest, Student, Fall 2012)

The notion that teachers should simplify (rather than complicate) their students' understanding of the past is particularly worrisome in this formulation, because students from an early age tend toward what Keith Barton has termed "narrative simplification" in their approaches to the past and this is not something we would like to see teachers perpetuate in secondary school students. (Barton 2008) There are probably cognitive reasons for this as well, as memory also tends to simplify narratives. Historians and the best history teachers spend a lot of energy on differentiating between the operations of memory and history, both of which use the past to make meaning, but which do so in very different ways.

Students' conception of the role of history teachers received a medium score if they recognized that they were to teach historical thinking, but were vague about the specifics of what this entailed; if they recognized that there were multiple perspectives on history that students might be given but did not specify the role that those perspectives were to play in their teaching; or if they referred to helping students understand historical causality, to providing multiple sources for students to work with, or to helping students to think critically, again without reference to what these things

mean. In other words, students who gave these kinds of answers were aware of history as an intellectual subject that requires students to think, but were not fully able to articulate what this thinking might look like. A typical answer looked like this:

Good history teachers are supposed to teach students more than just the little facts about history, but also how these events have different sides, opinions, validity, and also how these events will play a role in the students' future. (Pretest answer, Student, Fall 2013)⁶

The reference in this answer to “little facts” comes from a reading students did for the first class; “little facts” are falsifiable bits of evidence, as distinct from interpretations. (Szijártó 2002) While the answer is non-specific, it already points to a teaching approach that emphasizes complexity and multiplicity as well as evaluation of evidence and recognizes that the facts and history are not the same thing.

The most sophisticated student answers made reference to the role of teachers as resembling that of historians or to teachers as mediators between historians and students or to the importance of helping students understand what historians do; to teaching students to analyze or evaluate historical sources; to helping students understand the perspectives of past actors and present writers, to helping students learn to interpret or use evidence; to enabling students to draw their own historical conclusions or develop their own ideas about the past; and to preparing students to participate in civil society through their deployment of historical skills. These answers stressed the importance of teaching students to do research as well or sometimes to enabling students to see their own positionality or avoid presentism. One such answer is this:

Good history teachers are supposed to equip their students with the skills of the discipline to find and analyze information on their own. Good history teachers are to introduce multiple perspectives and guide students into a reflective mode of thinking that recognizes the complexity of issues yet continues to search/look for solutions/answers. (Posttest answer, Student, Fall 2013)

This response indicates that the writer knows that history is complex, that searching for historical truths should be an on-going process, and that his or her job will be to teach skills so that students are equipped to learn on their own. Most of the scholarly work on training social studies teachers for secondary schools posits that these teachers are to

teach students to think historically (see, for example, Barton & Levstik 2004; Lévesque 2008; VanSledright 2010; Wineburg, Martin & Monte-Sano 2012); this response recognizes the importance of historical thinking. This last category of answer was given a score of 3, the novice answers were given a score of 1, and we used half-point increments between the two.

Because the student answers were short, assigning these scores proved to be difficult. Each of us first rated all of the student responses independently, but it was not possible to assign a score without some interpretation of what the students meant, particularly as their answers were often very brief. For instance, if a student said, as one did, that good historians “investigate history and accurately interpret it for others,” what precisely did the student mean? (Pretest, Student response, spring 2013) Did this student mean that historians should interpret history based on the evidence they find (one sort of accuracy and indicative of higher-level thinking) or that historians should tell the truth about the past (a form of lower-level thinking about history)? Similarly, if a student says, that good history teachers, “Present parts of history to students and help them understand why past things are important today (how the past shapes the present)” what form does this student think the presentation is to take? (Pretest, Student response, spring 2013) In helping students to understand why the past is still important does this pre-service teacher expect to dictate the answers to students or to guide them in finding their own answers?

Each of us was necessarily influenced by what we knew of our own students. For that reason, inter-rater reliability was not terrifically robust. We concurred in our ratings in only about half of the 228 rated items, although the scores were not more than .5 apart in about 85% of the cases. However, it is worth noting that history as a discipline is prone to disagreements and historians frequently do not agree upon meaning. It is doubtful that any two historians given this task would concur completely, even given a crystalline rubric. To arrive at the figures in our tables, we then sat down and discussed the scores together, agreeing upon a joint rating of the items.

Supplemental instruments

In addition, we used two other sorts of measures. Díaz gave her students a multiple-choice diagnostic survey developed by the History Learning Project that isolates four critical moves historians make, places where we have found that students often get stuck. (On this instrument, see Shopkow 2013, 29-30) The instrument addressed key issues in the historical discipline and the conceptual choices provided ranged from novice-like, to semi-sophisticated and high level disciplinary moves. (For this approach, see Chi, Feltovich & Glaser 1981). Partly to encourage students to reflect on what they knew, Shopkow appended an additional and more personal question to her two most recent posttest surveys: “Have any of your ideas about what it means to learn history or to teach history or to know history changed over the course of the past semester? To what do you attribute these changes?” Although this question was open-ended, it allowed the students to reference their own work rather than abstract conceptions.

The Lessons

Finally, all of the students in all of the classes had to design a lesson plan to teach some form of historical thinking. Each of us examined these lesson plans (which had to include rationales for particular choices in constructing the lessons) to see how well the lesson incorporated historical thinking and how well the author was able to articulate how the lesson did so. We used a rubric similar to the ones we used in examining the pre- and posttests to assign a quantitative score (from 0 to 3 in half-point increments—in this case we thought it useful to have a score to award in cases where the lesson seemed to require no historical thinking at all) based on these two factors. Student scores on the survey were hidden while we did this to avoid contaminating the assessment with our knowledge of the students’ answers on the pre- and posttests.

Data Analysis

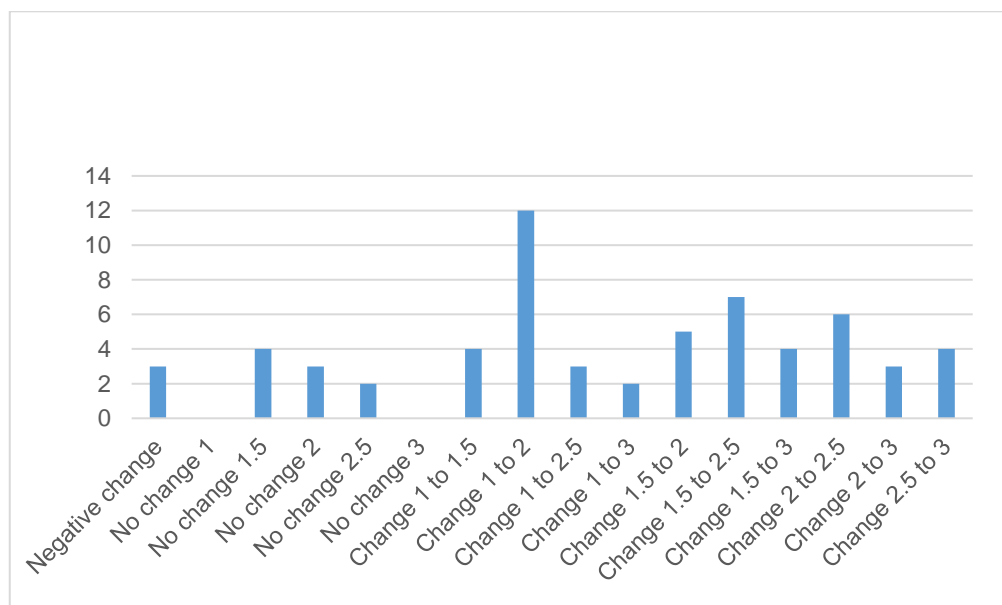
Nearly all of the students whose ideas were most novice-like in our survey pre-test initially were later able to articulate more sophisticated notions either of what historians do (and therefore had more complex ideas about the nature of history) or what history

teachers should do or both. Only three of the surveyed students were less sophisticated in their description of what historians do and even these students had a stronger notion of what they were to do as teachers. The majority of the students, however were able to give more sophisticated explanations both of the roles of historians and that of history teachers. Students were slightly more likely to improve their understanding of what it meant to be a teacher than to be an historian. We might expect such a result because most of the students were also simultaneously taking courses in the school of Education that stressed their role as future teachers, reinforcing ideas we were also attempting to convey to them and providing them with a vocabulary for expressing it.

To make sense of our data it may be helpful to think about where students were to begin with and where they ended up on each of the questions.

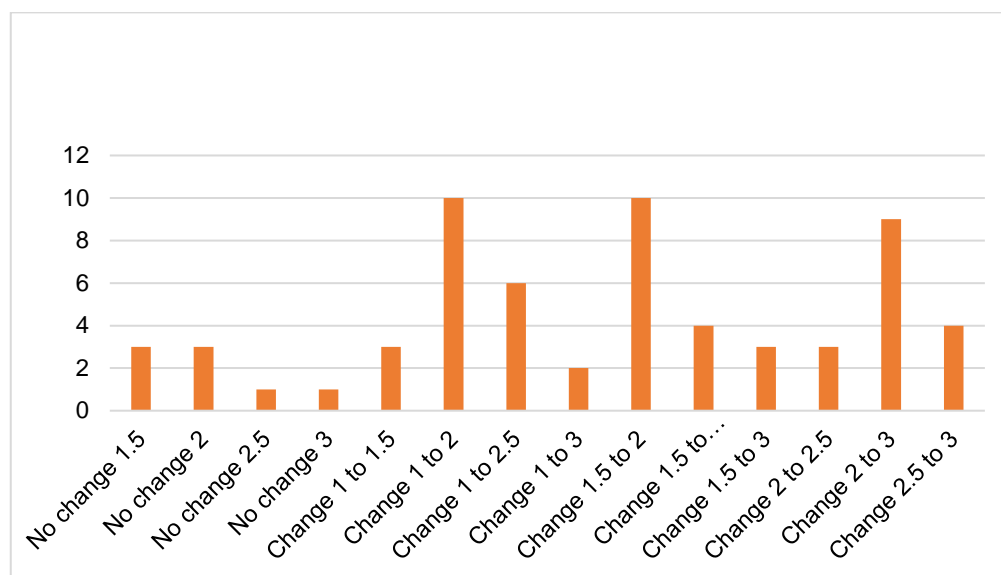
As our table shows for the first question, the modal change (12 students) was a shift from one point to two points, in other words, from a very novice-like position to a more discipline-specific conception of what historians do. The disciplinary model (a rating of 2) seems to be a liminal way-station in the negotiation of the threshold. (Meyer and Land 2006) Students were generally unable to make a jump from articulating a very low level of understanding directly to expressing the highest conception of the discipline, although a few did.

Figure 1. Student Change from Pre-Test to Post-Test on the Question, “What Do Good Historians Do?”



The picture for the question of what good history teachers do shows a similar pattern, although the distribution is bimodal, although it is worth noting that twenty-two of the students ended up with a score of 2.

Figure 2. Student Change from Pre-Test to Post-Test on the Question, “What Do Good History Teachers Do?”



This survey, however, measured only the ability of the students to articulate a position in answer to these questions, which we do see as a significant indicator of their passage through our two thresholds, as we will discuss below. The ability of the students to discriminate between less and more sophisticated responses was greater than their ability to articulate the various positions, however. When Díaz ran her quantitative survey of historical understanding with her classes, the students' scores tended to be higher than in their own answers to the question about historian's craft. In five cases (out of 26), students who got a score of 1.5 (a relatively naive answer) in the question about what historians do scored 2.25 to 3 in the multiple choice survey, where the highest possible score was 3. Only two students (13%) received the lowest score on the posttest multiple-choice survey.

It is possible that the students' responses in the qualitative survey were somewhat constrained by the questions, which might have seemed to call for formal and impersonal language that may have made their understanding seem more naïve than it actually was. In answering Shopkow's additional question about whether their ideas about history had changed over the semester, students sometimes came up with more

sophisticated answers (written at the same time) than on the questions about what historians do. In the survey question on historians one student wrote:

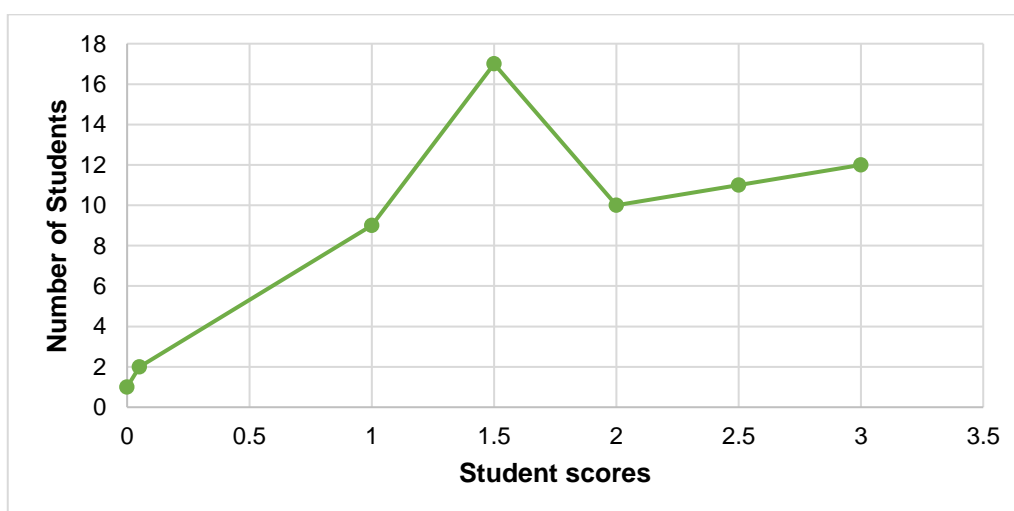
A good historian should be able to synthesize primary sources along with the work of other historians to draw well-supported conclusions about the past and create history. (Student response, Posttest, Fall 2013)

But in responding to the question of whether his ideas had changed over the semester, the same student wrote

Yes, I think I now have a much more skeptical view of what certain information I'm presented with means. By this I mean that to learn history you should consider multiple possibilities and evaluate their validity as sources in order to understand what they truly mean. To teach history is to equip students with the tools necessary to do this. I believe that to know history is to understand that nothing is necessarily certain and to understand why some things are perceived as truths. (Student response, Posttest extra question, Fall 2013)

The latter is a much fuller and frankly more sophisticated notion of both the historian's task and that of the history teacher. If the quantitative surveys, depending on recognition, represent an entry-level understanding, while the qualitative surveys represent a middle point in that they required students to be able to articulate the ideas themselves, the final projects represented application. Could the students apply their understandings of what it means to think historically and teach that skill? Student scores using this method were somewhat lower than in the qualitative surveys.

Figure 3. Student Understanding of Historical Thinking Measured in Student-Designed Lesson Plans



The modal answer now scored 1.5 and more than half of the students received scores of less than 2. However, when we ran the scores indicating student understanding of historical thinking as evidenced by their ability to design a lesson plan designed to promote it against their ability to articulate the nature of the historical discipline and their articulation of the job of the history teachers, significant correlations emerged.

Correlation among students' final project score, views on what historians do and what history teachers do

Table 1. Correlation of Final Project Grades with Student Scores on Pre- and Post-test Surveys

	Final Project Grade	What Historians Do Pre-Test	What Historians Do Post-Test	What Teachers Do Pre-Test
What Historians Do Pre-Test	.285*			
What Historians Do Post-Test	.599**	.357**		
What Teachers Do Pre-Test	.334**	.363**	.401**	
What Teachers Do Post-Test	.290*	.263*	.453**	.520**

Note. *. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

Not only was student performance in their lesson plans positively correlated with their scores on our survey, but those scores were more closely correlated to the students' ability to articulate what historians do than it was with their ability to articulate what history teachers do.

Conclusions

Because our sample is, from a statistical standpoint, fairly small, our statistics are suggestive rather than definitive. At first blush, passage through the teacher portal looks easier, because students are better able to articulate what will be expected of them as future teachers; their ability to explain how history works lags somewhat behind.

However, unless they demonstrated a deep understanding of what it means to do history themselves, our students were less able to design a lesson that incorporated what they had learned about teaching historical thinking. This is our first and most important finding, namely that teaching history and learning history are inseparable in shaping an effective history teacher; pre-service teachers must pass through the disciplinary portal before they can teach historical thinking to anyone else. This finding takes us back to where we began this article. Even if our students never teach a course for which students get college credit, they need to learn to produce history, or else they will not be able to teach it. The two are inseparable. This has large implications for public school systems which often do not require much training in history for their Social Studies teachers.

Second, students clearly need a great deal of iteration and practice to master historical thinking skills to the point that they become part of their automatic mental repertoire. As other studies by the HLP suggest, one class is barely enough to see enough change in a student's understanding of the discipline, especially if the disciplinary ways of thinking are not made explicit. (Díaz et al. 2008)

Third, this study also raises questions about the sole reliance on any single instrument, much less objective instruments, to gauge how well students are understanding this discipline or indeed any discipline. Many American universities are increasingly moving to these sorts of assessments, which can at best only show what students can recognize or articulate (likely the former, because these assessments are likely to be quantitative). Given that disciplinary ways of thinking are complex and somewhat murky, it is hard to articulate them and even more to put them into practice. To be able to identify high-level disciplinary ideas is a good first step which can be recognized in an objective instrument, an entry into liminality, but being able to articulate them in writing represents a higher level of understanding. The ability of students to apply what they are able to articulate is a crucial measure, which reveals that some students who are able to articulate epistemic concepts are not yet fully through the portal. Getting a good picture of how students move through a threshold or change epistemic beliefs then requires the use of qualitative and even oral assessments that can better capture how students are mentally processing the ways of thinking of the discipline and even the bottlenecks they encounter in that process. (VanSledright and Reddy 2014, 62-3)

While we would need one or two more years' worth of data to achieve a statistically significant benchmark, the trends observed so far in the survey are quite strong. An improved understanding of what professional historians do equips and empowers pre-service teachers in what they could and should do as teachers, but is more difficult for them to grasp. This is partly a structural issue—when students are taking more than one course with the same premises at the same time the effect is more powerful than a single course, but it is also indicative of weakness in the students' previous training in history. From our perspective, to become effective teachers our students need to pass through both the disciplinary and professional threshold because teaching history and doing history are indeed closely intertwined. Yes, even though they plan “only” to be Social Studies teachers, our students need to know how to “do” history.

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