

## On-line designs for supporting teacher epistemic communities: A comparative analysis

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**Abstract:** Over the past four decades, various types of epistemic resources required for teaching, and alternative infrastructures for creating and disseminating them, have been proposed. Today's proliferation of online tools for teachers means that there are infinitely more possibilities, setting the stage for a reinvigorated discussion surrounding what teachers are expected to do, and how best to support them in their work. In this essay, we offer a comparative analysis of three online platforms for teachers, to identify contemporary conceptions of teaching and to highlight some of the considerations and tradeoffs that should be taken into account when designing such a platform.

### Introduction

Over half a century ago, Derrida (1967/1997) foresaw “The end of the book and the beginning of writing” in the history of ideas. Contrary to the traditional philosophical view that sees language as a means to express an eternal truth – an undertaking he thought was epitomized by the book – Derrida argued that the meaning of a text is transient and contingent upon its readers. “The end of the book” thus acknowledges the limitations of language and ushers in a new era of philosophical inquiry, which Derrida called “the beginning of writing”.

In a similar vein, we are currently witnessing a major shift in the history of teaching, driven in part by the emergence of online platforms for teachers that offer viable alternatives to textbooks. Like Derrida's notion of “the book”, textbooks symbolize a definitive, finalized version of the curriculum, content, and means of its transmission to students. But contemporary information and communication technologies (ICTs) offer infinitely more design choices than traditional textbooks. As a result, questions pertaining to what teachers are expected to do, and how best to support their work, can be reevaluated in a new light. Like “the end of the book” – which is a precursor to “the beginning of writing” – the “end” of the textbook might bring about a “beginning” of teaching; a revitalized conversation about what teaching is, and what resources and infrastructures can best support it.

In this essay, we offer a comparative analysis of three online platforms for teachers. Our intention is to highlight possibilities afforded by emerging ICTs and discuss the ways in which they can position teachers vis-à-vis their students, the curriculum, and the teaching profession. For instance, should social networking technologies support teachers in sharing their work with one another? How much agency should teachers have in determining what, and how, to teach? What communities should teachers engage with in their work, and to what ends?

### Resources for teaching

#### Epistemic infrastructure

With the goal of elevating teaching from “mere craft” (Shulman, 1986, p. 13) to full-fledged profession, Shulman identified and articulated several types of knowledge that master teachers display in their work, including content knowledge, general pedagogic knowledge, curriculum knowledge, pedagogical content knowledge, knowledge of learners, knowledge of educational contexts, and knowledge of educational ends. Shulman maintained that the study of best practice could enable researchers to articulate this knowledge, so that it might be disseminated to teachers as part of their training, through professional development, and by other means, thereby contributing to the improvement of teaching across the board.

In the years since, efforts to develop epistemic resources for teachers, and the means for their creation and dissemination, have advanced in several directions. Ball and Cohen (1996) suggested redesigning curricular materials so that they might also be used to disseminate epistemic resources pertaining to content, pedagogy, the curriculum itself, and more, to teachers. Davis and Krajcik (2005) envisioned “educative curricular materials” that help teachers anticipate and interpret learners' responses; enhance teachers' own knowledge of the subject matter; draw connections between different curricular units; understand the pedagogical considerations that drive curriculum designers; and promote teachers' ability to adapt existing curricula to their own particular needs. Hiebert et al. (2002) advocated a “knowledge base for the teaching profession”. Notably, they detailed some characteristics required to ensure that resources for teachers would be useful and reliable. According to Hiebert et al., ensuring that resources are detailed, concrete, and specific, helps link them to practice. Organizing these

resources according to problems of practice (not according to the theoretical distinctions favored by researchers) interconnects different types of knowledge. Making resources publicly accessible means they can be openly examined and widely consumed by colleagues. And finally, sound mechanisms for quality control ensure that the resources are accurate, verifiable, and continually improving. What might such a repository look like? Hiebert et al. call on readers to “imagine large digital libraries linking video examples of teaching, images of students’ work, and commentary by teachers and researchers, all integrated around shared topics, and even shared lessons” (p. 8).

Epistemic Communities (ECs) offer another approach to creating and disseminating epistemic resources for teachers. ECs “consist of individuals with identical or similar ‘frames of reference’ and cognitive ‘orientation systems’” (Hakanson, 2010, p. 1807). Underlying an EC is a triad of theory, codes, and tools shared by community members. A *theory* is any frame of reference shared by community members that provides the context required for sensemaking, be it an evidence-based scientific theory, a normative view of what is good or right, or a ubiquitous rule of thumb. *Codes* are the “symbolic means” (p. 1810) by which community members communicate with one another, including both ordinary and specialized language such as formulae, diagrams, etc. Finally, *tools* are tangible artifacts such as hardware and software that community members use to accomplish their work, to communicate with one another, and to store their communal memory. According to Hakanson (2010), the epistemic infrastructure provided by ECs streamlines knowledge transactions – namely articulation of new knowledge and replication of existing knowledge in new contexts – within the community (cf. Nonaka, 1991).

Glazer and Peurach (2015) offered two concrete examples of well-developed ECs that functioned as an infrastructure for creating and sharing knowledge within a professional community of teachers and other educational practitioners. In their own words, “shared tools, theories, and codes served as the thread connecting classrooms and schools” (p. 192) and led to the success of *Success for America* and *America’s Choice*. Their analysis showed how the community’s epistemic and social infrastructures enabled *Success for America* to draw on the shared experiences of teachers to inform the design of the curriculum. Similarly, they observed numerous cases in their study of *America’s Choice*, where individual teachers’ insights were integrated into the design of formal tools that were then disseminated, shaping activity throughout the community.

## Communal infrastructure

In recent decades, sociocultural theories demonstrating how knowledge and other aspects of belonging to a particular community are interdependent have gained traction (e.g., Lave, 1991). Therefore, the expectation that teachers will simply draw on a public repository of epistemic resources may be unrealistic. While access to epistemic resources is crucial for supporting teachers in their work, a communal infrastructure is also likely vital.

Indeed, Shulman was ultimately dissatisfied with his earlier work because it focused on individual teachers and overlooked the communal infrastructure mediating their growth and activity. The alternative model that Shulman & Shulman (2004) proposed integrated two levels of analysis – individual *and* communal – and argued that the two co-constitute each other. Specifically, they posited that the individual teacher’s vision, skills, understandings, and motivations were supported by the communal ideology, community of practice, knowledge base, and mutual support within which they were situated (and vice-versa: the communal is also shaped by the individual). In a similar vein, Lampert, Boerst, and Graziani (2011) showed how access to a shared knowledge base supported ambitious forms of teaching at scale when it was coupled with a robust social infrastructure. Their study showed how (a) teachers with students in common regularly shared their experiences and insights with their colleagues; (b) lesson plans were neatly organized and easily accessible to everyone; and (c) the entire staff was well-versed in a shared theory that served as a basis for the shared enterprise of planning and evaluating learning.

ECs similarly highlight the social infrastructure that can support effective knowledge work among teachers. In addition to the cognitive work they afford, shared theories, codes, and tools also lay the groundwork for *communication* and *collaboration* among colleagues. Moreover, belonging to an EC provides members with a sense of *identity*, which is mediated by their participation in the community. Finally, the “irreducible tension” (Wertsch, 1997, p. 6) between individuals and communities’ cultural tools determines members’ sense of *agency*. The measure of agency can increase or decrease, depending on the design of the tool: “in some cases the cultural tool dominates the picture... in other cases the cultural tool presents a wide range of possibilities for improvisation and the mediated action that emerges is more heavily shaped by the agent” (ibid.).

## Mediating tools

Cognition can be viewed as a process that is distributed across agents’ minds and their surroundings, including the tools that they employ (Brown et al., 1989). To ensure that tools are useful, their designers imagine how they will be used, and build into them a consequent set of affordances and constraints. A tool’s *affordances* are the ways in which it can be used, which are “jointly determined by the qualities of the object and the abilities of the agent that is interacting” with it (Norman, 2013, p. 11); whereas *constraints* limit the ways in which one can

interact with a tool. For example, glass *affords* vision and *constrains* passage (Norman, 2013). Therefore, glass can be useful for designing a barrier that people are meant to see through, but not pass through. Importantly, affordances and constraints are not contradictory, but complementary. Together, they shape how a tool is used. To communicate a tool's intended use and affordances or constraints, designers use *signifiers*: "any mark or sound, any perceivable indicator that communicates appropriate behavior to a person" (Norman, 2013, p. 14).

The proliferation of ICTs in recent decades has led to an influx of educational technologies and online tools for teachers. These tools can be imbued with new types of affordances, constraints, and signifiers unavailable in traditional textbooks. They can include large amounts content; can be interactive and customizable; and can function as social networks for disseminating user-generated content and supporting teacher collaboration and mutual learning. Thus, ICTs can support novel forms of teaching, and can reflect evolving conceptions of what teaching is or what it ought to become. These emerging possibilities and views are reflected in the affordances and constraints embedded into the specific design of each tool.

## Some concrete examples

To advance our understanding of how online platforms can support different forms of teaching, we offer a comparative analysis of three platforms: *The Lesson Planner*, recently launched by Israel's Ministry of Education; *Reading Like a Historian* (RLH), of Stanford's History Education Group; and *Sefaria*, a virtual Jewish library. These online platforms were chosen based on a purposive sampling that highlights maximum variation in terms of their epistemic and communal infrastructures (Patton, 1990). Specifically, we asked three questions. First, what epistemic and communal infrastructures does each platform provide? Second, how are the epistemic and communal infrastructures mediated by the online platforms, in terms of each platform's affordances, constraints, and signifiers? And finally, what vision of teaching and teachers does each platform reflect and support?

For the sake of clarity and coherence, we adopted ECs as an analytic lens, focusing on the epistemic and social infrastructures provided by each platform, as well as their intended uses. Specifically, we analyzed each of the websites (i.e., *tools*), asking what *theories* of teaching underlie them; what *codes* they use to talk about teaching; how they afford and constrain *creative knowledge work* by teachers; how they afford and constrain *communication and collaboration* among teachers; what sense of *belonging* and *identity* they seek to inspire and support; and how each site affords and constrains teacher *agency*.

## The Lesson Planner

### Design

*The Lesson Planner* offers Israeli teachers access to thematic units and lesson plans in math, science, language arts, humanities, and more, organized according to the official curricula for grades 1-10. For instance, a unit intended to support eighth grade history teachers includes three lessons on the Enlightenment. The first lesson focuses on Enlightenment epistemology, exemplified by Kant's dictum *Sapere aude!* ("have courage to use your own reason!"). The second lesson shifts to a discussion of society and governance, introducing the terms *social contract*, *separation of powers*, and *enlightened absolutism*. The final lesson surveys Diderot and d'Alembert's Encyclopedia, and its significance to the history of ideas. The unit's landing page includes a paragraph with some background information, followed by three buttons labelled "knowledge and big ideas", "skills", and "values". Underneath, there are three more buttons linking to the individual lesson plans. Links to the lesson plans also appear in a sidebar as well as a drop-down menu at the top of the page.

"Knowledge and big ideas" leads to a 1200-word essay on the Enlightenment that includes references to academic works. It articulates three big ideas that are the crux of the unit: "anything can be achieved through the power of mind", "the growth of knowledge advances human progress", and "ideas breed political change". "Skills" leads to a list of nine generic skills, such as "digital literacy" and "critical thinking," that the unit mediates. Each skill is briefly defined, and a table details the various components in the unit that are connected to each skill. Finally, "values" leads to a list of three virtues: "passion for learning", "respect for humankind and family members," and "commitment to Israel as a Jewish and democratic state," which are all supposedly strengthened by studying the Enlightenment unit. Here too there is a table with links, but there are no definitions or explanations.

Each individual lesson has its own landing page, with four tabs: "Knowledge in the lesson", "Skills in the lesson", "Values in the lesson", and "Proposals for building a lesson". Again, the knowledge tab offers a comprehensive essay, whereas skills and values are more telegraphic, offering titles (in the case of skills also brief definitions) and a table linking to relevant components of the lesson. The fourth tab leads to an interactive interface that assists users in constructing lesson plans based the unit's themes and resources. On the left is an empty lesson plan template, titled "my lesson", which is divided into three sections labeled *introduction*, *body*, and *conclusion*. The right side of the screen is similarly divided into the same three sections, including several proposals for

activities and assignments in each section. For instance, for the first lesson on the Enlightenment, there are three proposed introductions. The first suggests asking students to share what comes to mind in association with the word “light”; the second suggests writing “ $2+2=5$ ” on the board and discussing with students what they know and how they know it; and finally, the third suggests contrasting epochs and events in the study of history.

Some of the assignments that appear on the right are interactive, allowing students to contribute by answering open-ended questions, commenting on a forum, highlighting text, etc. Some are collaborative, so that students can see each other’s contributions, whereas others collect individual student answers and present them to the teacher in an LMS interface. As they scroll through, teachers can either drag and drop individual suggestions from the right to populate the empty sections of the lesson plan on the left, or they can create new assignments of various types (open question, highlight the correct answer, add comments to a thread, etc.). Once the lesson plan is complete, it is automatically saved to the teacher’s profile pages, and s/he can share it with students via a link for distance learning, project it to a screen for face-to-face sessions, or print it.

### Epistemic infrastructure: Theories and codes

The theories about teaching that are embedded into *The Lesson Planner* touch on content and structure. In terms of content, the site calls for a triple focus on knowledge, skills, and values. In the Israeli context, this is part of a broader effort to realign pedagogic practice with a view that assigns the education system responsibility to promote social values and cultivate learners’ 21<sup>st</sup> century skills. Along these lines, Israel’s principal education law was redrafted in 2000 to highlight educational goals that include love and respect for others; cultivating learners’ personalities, creativity, and talent; and a set of skills and dispositions including intellectual curiosity, critical thinking, and ingenuity. In 2020, Israel’s Ministry of Education drafted a strategic document entitled “Skills of the [ideal] graduate,” calling for a greater focus on preparing graduates for the innovation age. Yet notwithstanding these frameworks, which are reflected in the general design of *The Lesson Planner*, the areas dedicated to knowledge, and the tools offered therein, are far more developed than those dedicated to skills and values.

As for structure, the platform assumes that individual lessons are insufficient for exploring big ideas, but that entire curricula are too broad. The middle ground – thematic series’ of up to five lessons – is considered best. The platform requires any lesson, regardless of subject and age-level, to be structured similarly, with intro, body, and conclusion sections. Thus, the designers of *The Lesson Planner* view teachers of various subjects such as mathematics, science, and history, similarly. The codes throughout the site’s interface reflect these two foci as well. The landing page for each unit and each lesson features multiple buttons and tabs labelled “knowledge and big ideas”, “skills”, and “values”; lesson plans are divided into “intro”, “body”, and “conclusion”.

### Communal infrastructure: Communication/collaboration, identity, and agency

*The Lesson Planner* allows teachers to easily share links to lesson plans with students. However, it does not afford collaboration among teachers: they cannot co-create new lessons, nor can they share their lessons with one another. By being open to *all* teachers, and to teachers *only*, the platform demarcates a professional identity that is determined by one’s status as teacher and is uninfluenced by specialization or focus (e.g., subject matter). Teachers are encouraged to be agentive, abandon textbooks, and innovate by creating original lesson plans. Yet, the role of teachers is also heavily constrained. Though in theory teachers could rely on the platform to plan their own lessons, the platform’s organization according to the existing curricula, the ease of drawing from available predetermined activities rather than creating new ones, and the requirement that all lessons be structured according to a general template, imply that teachers are encouraged to mostly stay within the vetted lesson plans.

## Reading like a historian

### Design

Stanford’s *Reading Like a Historian* (RLH) platform offers teachers free access to over 150 lesson plans. According to the site, “each lesson revolves around a central historical question and features a set of primary documents designed for groups of students with a range of reading skills.” For each individual lesson plan, there is a landing page with a brief introduction, an image, and links to downloadable materials at the bottom of the page. For instance, in *The battle of Lexington* lesson “students practice sourcing, corroboration, and contextualization as they weigh competing accounts of who fired the first shots of the Revolutionary War” ([sheg.stanford.edu/history-lessons/battle-lexington](https://sheg.stanford.edu/history-lessons/battle-lexington)). The landing page features downloadable teacher materials, student materials in English and Spanish, original documents (all three in PDF), and a PowerPoint file. Teacher materials detail specific instructions, scripted questions, and points to highlight for each PowerPoint slide.

Once teachers establish some basic facts about the battle, they are instructed to pose two questions: “What happened at the battle of Lexington? And who fired the first shot?”. These questions are first addressed by

comparing two images depicting the battle, one by Canadian artist Henry Sendham in 1886 and the second by Thomas Doolittle, a silversmith who spoke with veterans of the battle, in 1775. Teachers are instructed to “make sure to highlight how each painting might be considered both trustworthy and untrustworthy” before moving on to a comparison of two additional accounts of the battle: a diary entry by a British soldier, and the testimony of 34 colonists. Ultimately, “students should note that evidence about who fired the first shot is contradictory” as they summarize what they have learned about the Battle of Lexington and about historical inquiry more broadly.

### Epistemic infrastructure: Theories and codes

The theory underlying RLH touches on the purpose of history education, and on the role of teachers in realizing it. In his research, Wineburg (2001) has shown that professional historians ask a unique set of foundational questions when engaging with historical documents as they attempt to reconstruct and understand the past. However, the ultimate aim of history education in Wineburg’s (2016) view is not historical at all, but rather to cultivate historical thinking among learners, with an eye on transferring and applying it to contemporary contexts.

This goal is achieved by means of four key heuristics, which are also codes that describe the authentic work done by historians as well as by students in the RLH class: *sourcing*, i.e., considering the document’s source and purpose; *contextualization*, i.e., placing the document in a temporal and cultural context; *corroboration*, i.e., comparing the accounts of multiple sources against each other; and *close reading*, i.e., carefully considering an author’s use of language and word choice (Riesman, 2012).

### Communal infrastructure: Communication, collaboration, identity, and agency

The files that are available on the RLH platform are ready for use, and do not require any preparation. The site uses the PDF file format, which affords ease of use and consistent appearance in multiple interfaces, but is difficult to edit, thereby constraining modification. The implicit message to teachers is that designing the lessons does not fall under their auspices. The site does not afford any communication or collaboration between teachers, who are viewed as end users, not contributors. In terms of identity, history teachers are positioned as a bridge between expert historians and history students. They understand the purpose of history education and the codes that historians use; and they can make them accessible to learners by simulating historical inquiry. However, they are not expected to sift through archives seeking out primary documents that can shed light on the past. Teachers do not select which primary sources to teach, what questions to ask, or how to structure lessons in ways that are conducive to advancing learners’ historical thinking skills.

## Sefaria

### Design

According to its *About* page, “*Sefaria* is a non-profit organization dedicated to building the future of Jewish learning in an open and participatory way”. The site has two primary interfaces for interacting with hundreds of Jewish texts originating from across the globe and spanning thousands of years of authorship. The library interface allows users to search the entire corpus in various ways, such as a search bar, navigating to a particular passage (e.g., Genesis, 11, 4), or by topic (e.g., Yom Kippur). Selecting any passage in any work reveals a sidebar with links to all other passages throughout the entire corpus that cite it (or are cited by it), so that users can open multiple sources that are in conversation with one another, side-by-side. The sidebar includes additional functions, such as “chavruta” (=dyad), which provides a link to a video-chat room that users can share to learn a text together.

In addition to the interactive library, *Sefaria* also includes a *source sheet* function. Source sheets are blank documents that users can populate with texts, images, and videos that they upload or link to. In addition, users can search or navigate the library from within the source sheet interface and add select passages to their sheet. Alternatively, when a passage is selected from the library interface, it can be added to a user’s source sheet through a dedicated “add to sheet” button on the sidebar. Source sheets are an invitation to users to articulate new meanings by placing existing passages from various sources side-by-side. Like other contemporary cloud-based word-processing software, *Sefaria*’s source sheets are collaborative, and can be edited simultaneously by multiple users. Source sheets have unique URLs, are attributed to their creators and saved to their profile pages, and are also published on a curated “community” page that is regularly updated. In addition to the platform’s native functionality, *Sefaria* also actively maintains Facebook and WhatsApp groups for teachers. For instance, a *Sefaria* employee recently posted the following to a private Facebook group called “The *Sefaria* Classroom: Where Educators Share, Ask, and Think Together”:

Pop culture is definitely not my strong suit these days, but [...] I find it's a nice way to engage students. I've put together a sheet of clips from *Ha-Yehudim Ba'im* (“The Jews are Coming”), a

satirical (and irreverent) Israeli [TV] show, with some of the texts they reference or comment on. The sheet is collaborative, so you are all invited to add your own texts and clips you know of to this sheet. No need to restrict to The Jews are Coming, though! Any and all shows/movie clips are welcome!

(<https://www.facebook.com/groups/Sefaria.classroom/permalink/3927401540676757/>)

Attached to this post was a link to a source sheet on *Sefaria*, extending 25 pages long, which started off with the following explanation: “This sheet is a work in progress and collaborative, which means that anyone with a *Sefaria* account can add their own links and sources to this very sheet. Please contribute ...!”

### Epistemic infrastructure: Theories and codes

According to one Jewish tradition, the Jewish canon contains infinite meanings that come to light as individuals engage with it over time (Hartman, 2002). Indeed, a hallmark of Jewish culture is that the same canonical texts have served as the foundation for contemporary discourses throughout the ages, resulting in a vast and interconnected web of texts that are in dialogue with one another, in which the same words and expressions have taken on many meanings when interpreted from within different socio-historical contexts (cf. Bakhtin, 1981). Along these lines, *Sefaria* embodies a theory of teaching that fuses together four key ideas: (a) intertextual (b) meaning making, that is (c) mediated through discourse and (d) pluralistic in nature.

The codes that *Sefaria* employs reflect how it combines two distinct worlds: Torah study and contemporary ICTs. For example, the source sheet interface is reminiscent of modern word processors, with “file”, “format”, and “insert” menus and a “share” button at the top. But the library’s sidebar includes buttons such as “manuscripts”, “Torah readings”, and “Chavruta” – words drawn from the discourse of the Yeshiva world.

### Communal infrastructure: Communication, collaboration, identity, and agency

*Sefaria*’s design affords many forms of communication and collaboration among users. *Source sheets* can be collaboratively co-created; they are available through users’ profile pages; and they have unique URLs that can be shared. *Sefaria*’s homepage also includes a “community” button linking to a curated collection of recently published source sheets. Finally, source sheets are indexed by the site, and are searchable according to lexical content, tags, and topic, which essentially makes them part of the Jewish canon. The *virtual library* interface also affords communication, by means of the “Chavruta” video chat function.

While *Sefaria* maintains separate Facebook and WhatsApp groups for teachers to share ideas and lesson plans, the platform does not distinguish between teachers and other users. In terms of identity, *Sefaria* positions teachers as members of an intellectual community that extends beyond formal education and seeks to blur the boundaries between school and the outside world. Because this intellectual community values novel contributions to an ongoing open-ended conversation, teachers are encouraged to be agentive in their engagement with sources. The site does not preselect what to teach or how to teach it, but rather affords opportunities to easily navigate a large corpus of data and to offer novel contributions by selecting specific passages to focus on.

## **Designing ICTs for teachers in a post-textbook age**

### **Resources and infrastructure**

In the previous section, we identified several key differences between the epistemic resources available on each of the platforms we surveyed. This comparison highlights the degree to which the theories, codes, and tools provided by each site cohere with one another. RLH’s platform is markedly coherent. The site’s codes all derive directly from the corresponding theory of history education, and the tools (e.g., PDFs and PowerPoints that serve as handouts, presentations, and lesson plans) are appropriate resources for mediating the types of interactions this theory calls for: a learning environment in which students can read “like historians”.

Because it is trying to create a new type of learning experience that situates traditional Jewish texts within a contemporary digital context, *Sefaria*’s interface must bridge two distinct cultural worlds. The theory underlying it and the codes and tools featured on the site are complex and may not always cohere with one another. For instance, seasoned Torah scholars might easily navigate the traditional texts, yet still not comprehend the purpose of digitizing the library. Likewise, digitally literate individuals will quickly grasp the site’s hyper-textual, collaborative, interface; but they may not identify with the goal of intertextual discourse-based meaning-making.

Finally, *The Lesson Planner*’s interface features a different type of tension. The platform’s infrastructure outwardly embodies the view that teaching ought to focus simultaneously on knowledge, skills, and values. Yet, in practice, the resources it provides are almost exclusively focused on knowledge. This incongruence reflects the different forces at play within the Ministry of Education, whose influence is apparent in the design of the site. The

Ministry's leadership – responsible for outlining the *infrastructure* – is primarily political, and thus focused on the changing role of the education system in Israeli society, which is expressed in the emerging focus on skills and values. Yet the *resources* provided on the site were drafted by teachers and curriculum designers, whose perspective is shaped by their real-world classroom experiences, which tend to be knowledge focused.

## Identity and agency

So, who *are* teachers and what are they expected to *do*? One crucial insight that emerged from our analysis touches on the communities that teachers are expected to belong to, which shape their professional identity. According to *The Lesson Planner*, all teachers – regardless of the subjects they teach or the age of their students – belong to a single professional community.

In contrast, RLH is geared specifically towards history teachers and designed to cater to the unique aims of history education. RLH recognizes the value of the unique thinking skills that professional historians apply when investigating the past and sees history teachers as central to translating and importing them into K-12 settings. Yet notwithstanding the overlap between the two communities, professional historians and history teachers do essentially different things. For historians, sourcing, contextualizing, corroborating, and close reading are a means to interpreting and understanding the past. Yet for teachers, the equation is reversed. Historical inquiry is a means that serves the purpose of developing learners' thinking skills, which they require to successfully navigate current affairs. Finally, *Sefaria* also recognizes a distinction between two communities of learners: everyday people, and teachers. But contrary to RLH, *Sefaria*'s aim is to blur the lines between the two communities, to the point where what goes on inside the classroom and what goes on outside of it are in direct conversation with one another and essentially part of the same project.

Different views of what teaching is, what teachers do, and what they need, also entail different measures of agency. History teachers are not historians and cannot be expected to curate the primary sources for their lessons, because they do not have the expertise or means required to do so. Therefore, the resources that RLH provides are intended for use as-is; they are packaged in a format that is not intended to be edited (e.g., PDFs). In contrast, *The Lesson Planner* sees lessons as flexible, and so long as teachers adhere to the basic guidelines for content and structure, they are encouraged to design individualized lessons. However, while it provides a proprietary drag-and-drop technology to support the design of new lesson plans, *The Lesson Planner* does not allow teachers to share their original work with colleagues. This may be due to quality control concerns, or because the government is unwilling to relinquish control over content, especially in light of the politically-charged public scrutiny of curricular materials that address controversial issues ([blinded], 2017). Finally, *Sefaria* affords creation and dissemination of resources created by teachers, because its purpose is to democratize meaning making and undermine existing power structures so that more people will partake in an ongoing conversation they may previously have been marginalized from.

## Design tradeoffs

When resources are packaged in a ready-to-use format, as on RLH, they do not require much time or expertise to deploy; teachers can print PDFs and download PowerPoints in a matter of minutes. In contrast, navigating *The Lesson Planner* requires more time and expertise. Beyond the expectation that they will master its new drag-and-drop interface, teachers are also expected to choose from multiple suggested activities and resources, which is also time-consuming and expertise-dependent. Finally, using *Sefaria* to plan and teach a lesson requires even greater time, effort, and expertise, due to the requirement to curate different resources within a coherent theme.

Another important tradeoff concerns the interplay between quality assurance and teacher agency. The more agency teachers have in creating and disseminating content, the less oversight and control moderators have. This means that while a view of teacher-generated resources might seem appealing at first, there can be no guarantee that the resources they produce will be in line with the worldview the site is intended to advance. For instance, *Sefaria*'s moderators have no way of ensuring that teachers do not use the platform to create spurious connections or advance anti-democratic interpretations. *The Lesson Planner* can similarly be abused, but because lesson plans cannot be shared among teachers, the potential damage is relatively limited by the sites design constraints. And finally, RLH's approach means that quality of the materials on the site is assured.

## Conclusion

How might the emergence of new ICTs reshape teaching? Replacing textbooks with online platforms does not in and of itself ensure qualitative shifts in expectations from teachers or in the types of resources they are provided. Indeed, educational innovation can result “in even more old-fashioned, traditional forms of teaching and learning – instructionism on steroids” (Sawyer, 2014, p. 729).

However, the mere presence of online platforms alongside textbooks brings the inevitability of the content-delivery approach into question and requires curriculum designers to justify their choices. For instance, social networking technologies potentially afford a bottom-up approach to curriculum design, whereby teachers are actively engaged in creating and sharing – not just delivering – educational content. But as we have seen, there are tradeoffs inherent to such a model. More teacher agency means less quality control and might require teachers to engage in a new line of work they may not be prepared for. In light of emerging ICTs, these are tensions that should be addressed either way.

Like other professions that have undergone fundamental changes in the information age, teaching may eventually adapt to new technologies. The multitude of platforms that already exist online offer diverse possibilities, requiring practitioners, policymakers, researchers, and others to stake their ground, and clearly articulate what types of infrastructures and resources they believe contemporary teachers need, and why.

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