Evaluation of HSTRY Interactive Timeline Application (hstry.co)

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Introduction

Hstry (www.hstry.co) is a teaching and learning tool initially developed for history education. The application allows students and teachers to create timelines by utilizing publicly accessible primary and secondary sources. Hstry supports images, video, text, and other media and allows the user to organize these materials into a coherent depiction of a historic event. Hstry also incorporates tools for formative and summative assessment, as well as other interactive elements.

The developers of Hstry are dedicated to creating a product that is not only useful to teachers, but also fits within contextual boundaries that teachers face, such as technology infrastructure and curricular pressures. In order to help determine the potential adoption of Hstry into the classroom, stakeholders asked the author of this document to conduct an evaluation of the Hstry platform. Using a technology integration model based on the works of Zhao, et al. (2002) and Ertmer (1999), a critical evaluation was conducted to determine potential compatibility of Hstry within a typical history classroom. This evaluation was based on the following criteria:

- Alignment to teachers' pedagogical beliefs, current practices, and technical abilities
- Ability to perform on available technological infrastructure
- Realistic use in a typical history class
- General usefulness to a teacher

Results of the evaluation found high compatibility of Hstry with K-12 history instruction. Hstry has the potential to support a variety of instructional activities that fit with multiple pedagogical approaches. There were no critical usability or function flaws found from this evaluation, however, modifications could be made to better suit a broader audience of teachers. Details of these findings are given as well as suggestions for both marketing and further development purposes.

Understanding teachers' incorporation of technology

Successful incorporation of technology into the classroom is a complex issue. Although schools and districts invest great deals of money into technology, its effectiveness with supporting instructional practices is debatable. The rapid development of technology makes it very difficult for schools to obtain up-to-date hardware and software, and lagging incorporation of technology in the K-12 realm makes timely scholarly empirical research difficult to perform (Liu, Scordino, Guertz, Navarrete, Ko, & Lim, 2014). Despite these difficulties, incorporation of educational technology receives a great deal of attention as a topic of investigation. This research has provided frameworks on which instructional technology innovations may be evaluated.

Three domains of technology integration

Adoption of a technological innovation can be viewed via three interacting domains: the innovation being implemented, the user implementing the technology, and the context in which the innovation is being implemented (Hord, Rutherford, Huling-Austin, & Hall, 1987). Many adoption models share these three categories of focus (Straub, 2009), including the framework of Zhao, Pugh, Sheldon, and Byers (2002), who determined that interactions between the innovator (teacher), innovation (specific technology), and context (school environment) account for the enabling conditions of technology implementation in a K-12 classroom. The *innovator* domain refers to the characteristics of the teacher attempting to implement technology. Specific characteristics include: teachers' proficiency with technology, the compatibility between teachers' pedagogy and the technology, and the teachers' ability to navigate the culture of their school. The *innovation* domain refers to the technology being implemented. Factors associated with this domain involve the "distance" the innovation is from existing practices of teachers, from school culture, and from available technology infrastructure. Finally, the *context* domain refers to the school environment, and includes technology infrastructure, social infrastructure, and school culture.

The role of the teacher-innovator

While Zhao, et al. and others highlight three separate domains, it should be noted that the innovator (i.e. teacher) is considered to be the most influential of the three. Ertmer (1999) suggests that *intrinsic* characteristics of the teacher have a greater impact on technology

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integration than *extrinsic* characteristics of their environment. Teacher beliefs and knowledge[1] potentially enable teachers to overcome contextual barriers (e.g. lack of resources, time, and support). The teacher can be considered as "an autonomous agent with the power to influence appropriate (or inappropriate) integration of technology" (Koehler & Mishra, 2008, p. 26), and it is the teacher who ultimately decides what and how technology is incorporated into the classroom.

Implications for K-12 technology

When designing an innovation intended for teachers, it is important to remember the influential role of the teacher. In addition to being usable (easy to use), useful (able to complete required tasks), and feasible (able to be implemented within existing infrastructure), a K-12 innovation must also appeal to teachers' beliefs and fit with their current practices. These questions should be asked when designing and evaluating a technological tool used by teachers:

1. Does the innovation fit within teachers' pedagogical approaches?
2. Is the innovation usable by teachers of various technical abilities?
3. Does the innovation work within the constraints of the classroom?
   a. Technology availability
   b. Time restraints
4. Can the technology be used to address curricular pressure?
   a. Support state standards
   b. Used to teach required content

Developing a tool with these questions in mind can improve the compatibility of that product with K-12 education. Compatibility does not necessarily guarantee a high rate of adoption. However, schools and teachers will face fewer barriers to adoption when attempting to implement an innovation that is highly compatible. The above questions served as a structure for an evaluation of Hstry in order to determine its compatibility with K-12 history instruction.

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[1] For more on the influence of teacher knowledge on technology choice and incorporation, see Ertmer (2005), Ertmer & Ottenbreit-Leftwich (2010), and Hughes (2005)

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Does Hstry fit within teachers' pedagogical approaches?

Most teachers use a variety of methods depending on the content being covered and the students they teach. Although there are countless teaching methods, these techniques can be organized based on the expectation of student learning. Perhaps the most familiar of such categorizations, Bloom's Taxonomy (Bloom, 1956), organizes learning activities from the lowest order ("knowledge") to the highest ("evaluation"). Based roughly on the same principals, Hammond and Manfra (2009) organized potential technology-infused social studies activities into three categories that cover a wide range of pedagogical techniques. These categories include: *giving, prompting,* and *making.*

Giving, Prompting, and Making in Social Studies Education (adapted from Hammond & Manfra, 2009, p. 164)			
	Giving	Prompting	Making
Expected Student Behavior	To absorb and retain information; passive (or internally active)	To observe, detect patterns, create associations or make inferences; active	To generate a product, create order, describe and support a conclusion; active
Teacher Stance	To create structure, impart meaning, assign significance; active, authoritative	To present, contextualize, paraphrase, invite elaboration, juxtapose statements or evidence; active, facilitative	To supervise, challenge, offer feedback, model; active, collaborative

Giving

Giving approaches align with direct instruction (e.g. lecture, reading from a book, watching a video). Direct instruction has received criticism for its failure to appeal to higher order thinking skills. However, direct instruction remains a dominant approach in history survey classes, as it allows for coverage of a breadth of information in a short amount of time (Sipress & Voelker, 2009). As such, it is important that Hstry can support these types of instructional approaches.

At its most basic level, Hstry is a tool for creating timelines. It also potentially allows for the viewing of others' timelines. In terms of a "giving" approach to instruction, Hstry allows teachers to summarize and present material in an organized manner. In this way, students are able to view a fixed chronological summary of an event or time period. In addition, many kinds

of content can be used, offering a broader multi-modal portrayal of a historic event as compared to a fixed medium from a single source.

In addition to teaching chronological content, Hstry may be used as an alternative to presentation software often used for lectures, such as PowerPoint or Prezi. Once saved, teacher-created materials can be accessed in or out of school (provided a device with Internet access). This allows students to access these materials without the assistance of the teacher. The teacher may utilize this affordance to promote direct instruction at home (such as in a "flipped" classroom model), or provide review and make-up instruction to be accessed on the students' own time.

Prompting

Prompting refers to activities for which students are provided with materials to observe, make comparisons, judgments, or inferences. Common examples of "prompting" activities include: taking sides for a debate, comparing multiple accounts of the same event, and making inferences from historical images. Activities such as this help promote critical thinking skills and require students to take an active role in learning. Additionally, prompting approaches appeal to the middle- and high-order thinking skills that are reflected in current standards. These types of activities are extremely popular in history classes, so the extent to which Hstry can support prompting activities will likely impact its appeal to teachers.

Hstry gives teachers the ability to curate resources from multiple sources for students to access in a single place. Timelines can be used as teacher-created learning objects that allow students to interact with learning without the teacher dominating instruction. Teachers may choose to use a timeline to organize primary sources to be analyzed by students. The ability to embed prompting questions and checks for understanding within a timeline enable the teacher to facilitate student learning, which is a needed factor for prompting activities.

Teachers may also use timelines created by educators elsewhere. This potentially allows students to compare accounts of the same event from different parts of the country or the world. Teachers may also create multiple timelines of the same event to show different perspectives (e.g. Loyalist/British/Patriot accounts during the American Revolution). "Perspective" taking activities such as these help promote historical thinking skills by helping students see the ambiguous nature of historical knowledge.

Making

  Making activities require students to create a finished product to demonstrate their knowledge. These types of activities align with constructivist learning theory[2], which promotes interactive instructional practices as opposed to teacher-dominated instruction. Constructivist approaches are encouraged in K-12 history (see, for example, Crocco, 2001; Doolittle & Hicks, 2003), as they require students to use higher order thinking skills. Popular history activities within the *Making* category include: creating documentaries, painting murals of local history, or conducting original research to write reports.

  As earlier noted, a teacher may use Hstry to "give" knowledge to his/her students through direct instruction. Embedded in Hstry's design, however, is the ability for teachers to create "classes" and invite students to access premade timelines as well as publish their own timelines. This enables students to create their own projects, such as a personal timeline or a learning module to teach fellow students about a historic event.

  Hstry may also be used as a type of project management tool to help students prepare and develop a project. Students may use timelines to storyboard a video project, or organize historical documents to help corroborate claims for a critical biography or book analysis.

  Hstry, then, is capable of supporting a variety of pedagogical approaches. Teachers may use Hstry to provide direct instruction, whether by creating their own timelines or using vetted materials to learn about events. Teachers may also curate multiple sources within a Hstry timeline for students to analyze and compare. Finally, students are able to plan and create their own original work.

  Teachers are more likely to use a technology if it aligns with their current practices. If a technology simplifies or enhances current practices, teachers are more likely to continue using it from year to year. Hstry has the ability to support, simplify, and enhance a variety of common history teacher practices, as determined by this analysis. Teachers, however, are not likely to spend time analyzing this tool. In order to boost the initial appeal to teachers, Hstry's potential to support multiple types of practices (such as the examples given here) should be advertised.

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[2] Seymour Papert (1991) referred to learning-by-making approaches as "constructionism." This term perhaps more accurately describes approaches in this category, as constructivist approaches don't necessarily require learners to create a tangible product. The concept of "constructionism," however, is neither as widely used, nor as widely accepted as a learning theory as constructivism.

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Is Hstry usable by teachers of various technical abilities?

The ubiquity of digital technology in our daily lives has led us to some assumptions about technology use by teachers. In 2001, Marc Prensky introduced the concept of "digital natives," an assumption that people born after a certain year (it varies from 1980-1990) have always had technology in their lives, thus making them more capable users of technology than previous generations. As digital natives enter the teaching force, it is assumed that they will apply their abilities with technology to their teaching practices. There is actually no evidence that supports these assumptions. In fact, evidence of the contrary exists, suggesting that teachers with more experience may do a better job of incorporating technology into their instruction than those with less experience (Russell, Bebell, O'Dwyer, and O'Connor, 2003). Additionally, the ability to use technology for personal reasons does not automatically translate to the ability (or desire) to use technology for teaching. The truth is, assumptions cannot be made about the level of technological knowledge teachers have, or about their ability to use technology for teaching. Designers of technology intended for teachers should make their innovation as easy to use as possible, so that teachers of any ability levels may use their product.

There is not much to Hstry. That may sound like a criticism, but from a usability standpoint, simplicity is crucial. Complexity can be intimidating for users, adding to its perceived difficulty. Upon entering Hstry for the first time, the user is guided through a tour, which gives directions for adding classes and creating timelines. For more advanced users, there is the ability to "skip" the tour and start accessing and creating content. Additional support for using Hstry is easily accessible in the form of a *Help* section that which contains FAQs, categorical support topics, and instructional videos. These features make Hstry easy to learn, but most users will probably not need to spend much time "learning." Hstry's basic functions are fairly intuitive, making it easy for the user to explore and figure out without much guidance.

Hstry is intuitive and contains a number of instructional resources; making it possible for teachers of many skill levels use it. In terms of technical usability, my only advice is to maintain current design choices. I feel that the simplicity of Hstry is one of its biggest strengths.

It has been my experience that teachers with high tech skills, knowledge of useful tools, and/or high motivation to use technology will share a tool that they like with their colleagues. Word-of-mouth can be much more powerful for increasing awareness and providing support than formal professional development sessions. Teacher communities of practice (both face-to-face

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and virtual) are valuable for teachers who want to share ideas and learn new techniques. It may be helpful to provide a platform, such as a forum, that will allow early adopters/expert users encourage novice users to try Hstry in their classroom.

Can Hstry work within the constraints of the classroom?

Technological availability

Very little can be assumed about a schools' access to technology. While 1:1 computer (or tablet) initiatives are becoming increasingly popular, the average public school does not enable this type of access. Additionally, the quality of computers varies greatly between and within schools. Some school may have classrooms with brand new MacBooks, but another might have a couple of donated Frankenstein computers struggling to run Windows XP. Unfortunately, the latter scenario is probably more likely than the former. Computer access may be limited to labs or a set of laptops shared between many classrooms. While many schools have high speed Internet with Wi-Fi access, network connections may be unreliable, or unable to handle numerous connections. Cheaper alternatives to full computers, such as tablets and ChromeBooks, are gaining popularity in schools, and many districts are implementing "bring your own device" policies. These two factors contribute to the diversity of devices being used, limiting the usefulness of platform-specific software.

Teachers don't have access to the best technology, and the technology they do have is often shared in a media lab, or mobile computer on wheels (or "COW") carts. From my experience, social studies teachers have especially limited access to shared resources because priority is given to teachers of tested subject matter (e.g. reading, writing, and math). Because of the limited resources available in many schools, designers of classroom technology should make sure their products are able to work across a variety of platforms and require minimal resources.

Hstry is entirely browser-based. This is beneficial in that it does not require teachers to download software (which teachers are not often able to do without the assistance of an IT support person or permission from the district). As a browser-based application, Hstry is able to run on different operating systems. Load times when running Hstry are fast, suggesting relatively simple processes are being executed. This means that the application does not require excessive bandwidth or processing ability.

It is possible for Hstry to be used on multiple types of devices and requires minimal processing power to run. It is therefore likely that Hstry can be used in most classrooms. Being browser-based allows great flexibility, but makes is completely reliant on a stable Internet connection. This creates a potential problem in the somewhat likely case of a lost connection within a school. Fortunately, work done in Hstry is frequently saved automatically, which

prevents lost work in the case of a disconnection. The addition of offline capability, or ability to save work locally would help with the stability when using Hstry. This would likely require the development of computer and tablet-based applications, which can be costly and negates the aforementioned benefits of being browser-based. Therefore, the ability to at least export and run finished projects is suggested.

Time restraints

Technology (digital and otherwise) allows us to accomplish more in a given time period than we are able without it. In some ways technology has had a similar impact in K-12 education. However, "time" remains a significant barrier of technology adoption and success. Even if a technology is relatively simple, using it to execute a lesson may be difficult to accomplish within a typical school day. Periods are short, and constantly interrupted. Time constraints and interruptions are particularly bothersome in history, as teachers are usually required to cover large amounts of content in a short amount of time. The logistics required for implementing technologies often requires additional time, as well. As time is a rare commodity, technologies that do not require a lot of time, or better yet, *save time*, are more appealing to teachers.

Premium access to Hstry includes "bundles" of lessons around a particular topic. The estimated time needed to complete the individual lessons is usually less than a half hour. Even after factoring for the logistics of logging into devices and the common distractions in the classroom, 30 minutes to cover a lesson is possible in the typical 40-45 minute class period.

Creating a timeline in Hstry can require a lot of time. However, this is also true of the necessary work for planning any lesson, such as creating a PowerPoint, or even making a bunch of copies of a worksheet. Because Hstry is web-based, teachers may work on their lessons during planning periods or when they are "off" and planning at home. Also, timelines are automatically saved as they are being built, which prevents lost work and lost time.

Once a teacher makes a collection of timelines, whether by creating their own or using others, they can access their collection between years. This is very important, as teachers will reuse a lesson that they find effective. There is no need to worry about losing the content they saved on their classroom computer or laptop, as the timelines are saved within their account.

It can be surprising to see how long it takes students to complete projects with technology. This is especially true of younger students, but applies to secondary students as well.

Just getting started and ready to work can eat up half of the period. Any "start-up" activities that can be eliminated or streamlined will increase the amount of time for learning. For example, enabling teachers to create and save templates to give to students, will allow students to more easily "hit the ground running," so to speak. Reusable templates would also help teachers who use the same structure for teaching multiple topics.

Also, consider what modifications can be made to Hstry to improve multi-year use. A teacher may have multiple classes within her account, but that can get very confusing if the account is used for a number of years. To prevent teachers from needing to start new accounts every year, it would be helpful to provide the ability to archive or export work (especially student work) from previous years.

Contextual boundaries, such as available technology and available time, create barriers for teachers attempting to incorporate technology into their teaching. Hstry is a browser-based software, allowing it to be run on many types of devices. Its simple design does not require significant processing abilities, making it compatible with both new and older technologies. Hstry's dependence on consistent Internet connection makes it potentially unstable in classrooms with slow or unreliable Wi-Fi connections, and it is suggested that offline capabilities be explored.

The time needed to create and execute lessons with Hstry is no greater than the time needed to create and execute other technology-infused lessons. The ability to access Hstry from any place with Internet access allows teachers the flexibility to plan their lessons during planning periods or while at home. Teachers' collections of timelines can be accessed and reused, which is helpful for teachers who teach the same subject for multiple years. Allowing teachers to archive or export previous years' content may help simplify the reuse of accounts. It is also recommended that teachers be given the ability to create and save templates to optimize planning and instructional time.

Does Hstry address curricular pressures?

In terms of standardized testing, the social studies don't get as much coverage as reading or math. That is because history (and other social studies) is not tested as frequently as the other two. However social studies still come with a variety of standards that need to be addressed. Standards in history create a sort of "valued knowledge," or content that teachers are required to cover. Politics aside, the pressure to cover tested material limits the time a history teacher can spend on any given subject. To address curricular pressures, then, a technology intended for the classroom should not only support addressing standards, but also not too have too narrow of a focus.

Hstry is a platform for organizing and sharing content. There are pre-made materials that may be used by teachers, but the main purpose of Hstry is to support a teachers' instruction, rather than instructing for them. A teacher may choose the topic being covered, as well as the depth at which that topic is covered. This flexibility allows teachers to design instruction that meets social studies standards as well as specific district or school pressures (e.g. practicing reading skills, vertically aligning instruction across grade levels).

Content provided through a premium account includes vetted collections that are created by the Hstry team, practicing teachers, and other collaborators. These collections include completed timelines, lesson plans, and an overview of the particular event. Tooltips are provided within the overview text, providing "hard" scaffolds[3] of vocabulary definitions and descriptions of key figures. A summary of the "Aims" for student learning, a list of Common Core Standards addressed with each collection, links to content sources and other related information, and estimated time required to finish the lesson are also provided.

The design of each collection is reminiscent of a very detailed lesson plan that a teacher may give to a supervisor when their teaching is being evaluated. This suggests the designers of collections have an understanding of curricular pressures faced by teachers. Listing the Common Core Standards of each lesson shows a sort of credibility in this current standard-driven world. The National Council for the Social Studies (NCSS) has social studies-specific standards, the incorporation of which may help bolster this credibility. Additionally, some states still have their own sets of standards, and seven states have not adopted the Common Core. Incorporation of

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[3] "Hard" scaffolds refer to learning scaffolds embedded within instructional media. These differ from "soft" scaffolds that are provided, as needed, by teachers. For more on hard and soft scaffolds, please refer to Brush & Saye (2001) and Saye & Brush (2002/2007).

state standards would likely enhance Hstry's appeal to administrators. Associating every lesson with every applicable state standard, however, would be a huge undertaking that may not worth the effort. It is possible to pass this task to the teachers using and creating timelines, perhaps through some sort of tagging feature.

In my experience, the two most common complaints from teachers using premade materials (lessons, content collections, etc.) involve the incompatibility of provided resources with their content area. Topics may be too specific, and the time needed to cover them is not worth the minimal standards they address. Additionally, some teachers, especially those teaching state histories, struggle to find content appropriate to their specific subject matter. As previously discussed, many lessons provided through premium access are substantially shorter than a typical class period, allowing quick coverage of an event. In addition, there are a number of available timelines that cover long periods of time, covering key events while maintaining brevity. With the growing number of community timelines, topics are very diverse. It can be assumed that as this collection grows, state-specific lessons (e.g. Texas history) become more numerous, providing specific content needed by teachers.

It is impossible to account for the specific instructional needs of all teachers. Teachers may find content that covers the topics they need, but it may be too long, not age appropriate, or incompatible in some other way. From investigating teachers' use of materials from the Internet, I have noticed that teachers will often modify lessons or content that they find to work better within their class. Enabling teachers with the option of modifying existing resources may increase their ability to use Hstry to address their required standards.

Hstry, then, is able to support instruction adhering to standards and other curricular pressures teachers may face. Pre-made materials do fit within standards, but it may be helpful to reference specific state standards as well as non-social studies standards. Additionally, it may be helpful to allow teachers to manipulate pre-made timelines, so they may be adjusted to meet teachers' specific curricular goals.

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Summary

The Hstry application was evaluated in terms of potential use by teachers in the history classroom. Criteria for the evaluation focused on compatibility with characteristics of teachers and the context of K-12 schools. In summary:

- Hstry was determined to potentially fit with a variety of common instructional approaches aligned with a range of learning theories. The simplicity of Hstry and availability of embedded support allow teachers of different technical abilities to use the application. "Advertising" the multiple ways in which Hstry can support various pedagogical approaches will make it more appealing to teachers and administrators. The development of internal support structures (such as a teacher forum) may accelerate the speed of adoption and enhance learnability for new users.

- As a browser-based application, Hstry is able to work on multiple platforms. Hstry does not require excessive resources to run, which enables it to run limited technology. Enabling offline access or the ability to save work locally may enhance usability for classrooms with limited or slow Internet access.

- Vetted lessons provided through premium access are brief and can fit within a typical class period. The ability to save projects and return to them (both in and out of class) increases ability to divide a project into period-long activities. To reduce the time needed for teachers to prepare lessons, it is recommended that developers consider a simplified way for teachers to create (and possibly share) reusable templates.

- Lessons contained within premium bundles meet Common Core Standards, which are noted on each lesson. As a curating/publishing tool, the flexibility of Hstry allows teachers to create lessons that meet their individual curricular goals. It is recommended that instructional designers highlight not only Common Core Standards addressed, but also state and/or NCSS standards. Enabling modification of premade resources will help teachers adjust content to meet their specific curricular needs.

In its current state, Hstry is a well-designed tool that has great potential for use in history (and other subjects) classrooms. Generally speaking, this evaluation found no critical usability flaws or major conflicts with classroom compatibility. Ideas for improvement are merely suggestions. While these suggestions may improve the Hstry application, issues of cost and time for development should be considered before attempting any changes.

Suggestions for marketing and further development

Marketing

It is apparent that a great deal of planning went into the development of Hstry, as evident by its alignment with pedagogical, technical, and contextual factors in K-12 schools. In its current form, I believe that Hstry is very useful in history class, and it is a tool that I personally would use if I were still teaching. I hope this evaluation will support a theoretical background for Hstry to justify funding and academic collaboration.

When choosing instructional technology, though, administrators and teachers do not have the time to evaluate tools. My one major concern with Hstry is that it may be dismissed as merely a collection of timelines or a timeline creation tool, thus limiting its appeal beyond history nerds like myself. Unfortunately, there is a severe lack of history nerds in the groups of people who decide what knowledge is valued, making the demand for history tools minimal as compared to tools for STEM or reading. To make Hstry more financially justifiable to schools and districts, please consider promoting the following uses of Hstry.

Using Hstry in other subject areas

One thing I really liked about Hstry (besides its potential to support historical thinking and critical history education) is its ability to support cross-curricular skills. Literature, science, and mathematics all have chronological elements that can be covered using a Hstry timeline. Reading and writing skills-- such as summarizing and planning—can be supported with the use of Hstry. Hstry can be used as a graphic organizer, which are frequently used in elementary and middle school. These are just a few examples of ways this application can be utilized in different subjects. Highlighting use for other subjects, especially STEM and reading, will certainly boost the appeal of Hstry.

Using Hstry as a "curation" tool

What distinguishes Hstry from other timeline tools is that Hstry is truly a platform that teachers can use to "curate" resources for students to learn from. The idea of the "teacher as curator" is somewhat trendy right now, so highlighting Hstry as a curation tool will give it some buzz-worthy credibility. More than just a buzzword, though, curation has practical appeal. I am finding that teachers are relying less and less on textbooks (specifically in history, but in other subjects as well). This could be partially due to teacher preferences, but I believe there are financial factors as well. Whatever the driving force, teachers are relying on the Internet for

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content. Hstry provides them with a platform to not only organize this content, but also (very importantly) allows them to access and reuse their collections from year to year.

Using Hstry to support "21st Century Skills"

By using Hstry, students are learning subject-specific content and skills. By using Hstry, students are also developing innovational, creative, and critical thinking skills. They are evaluating content and using technology to publish work, thus developing media and technology literacy. These skills are not content-specific, but rather general skills deemed necessary by the Partnership for 21st Century Skills (www.p21.org). These skills are not assessed with standardized testing, so the value placed on them is probably not universal. However, many teachers and administrators understand the importance of preparing their students for the future with skills they will need to be contributing members of society. Highlighting Hstry's role in developing 21st Century Skills will increase its favorability among those educators.

Using Hstry for instructional design

Although Hstry was originally intended to create historical timelines, the platform may also be used for organizing and displaying any type of content. Teachers may use a timeline to provide resources for a lesson on a topic, or organize many lessons to be followed in a specific order. There are some formative assessment tools already built in, providing the ability to create self-contained learning modules. If potential users are able to view Hstry as a way to create learning modules, and not just a way to present a chronological story, they may perceive Hstry to be more useful.

Using Hstry as a portfolio

Students may create Hstry timelines to display their learning of a particular topic. Hstry may also be used to display (or link to) student work on multiple topics. If a student creates a video for a project, for example, it can be embedded into a Hstry timeline. If used in this manner, students can create portfolios of their work that can be expanded from year to year. Student portfolios are not a new concept, but are gaining popularity as supplemental or alternative assessment, especially in schools using Project Based Learning. Publishing work and recording one's own work are also seen as important skills for students to develop for college and adulthood, making it beneficial to highlight Hstry's ability to serve as a portfolio platform.

Further development

If further development of Hstry is to take place, I suggest the following:

- **Avoid doing "too much."** Taking on new techniques or tools is often met with resistance and may be perceived as a burden to teachers. Features can be great, but if there are too many, teachers (especially new users) may become overwhelmed.

- **Continue to optimize processing speeds.** Another benefit of limiting features to basic tasks is that it reduces processing overhead. Using simple graphics and minimizing content on pages will also help with optimization. I think Hstry already does a good job with this, so keep it up!

- **Feature examples of practices that teachers are familiar with.** Show off examples of Hstry being used for practices other than creating chronological timelines. Remember, teachers are most likely to use a technology that aligns to their current practices. Show that this is a new and better tool to enhance their practices.

- **Remember that teachers tend to reuse successful lessons from year to year.** Teachers would appreciate the ability to reuse their accounts and content they created. Adding the ability to clear, export, or archive classes may encourage continual use.

- **Consider the potential of templates.** I explained that allowing teachers to create and save templates and distribute them to students would help them save some time. Also consider templates you may design and provide, especially for the "alternative" uses of Hstry I suggested (portfolio, learning module, etc.)

- **Allow modifications.** From everything I have learned about teachers' use of Internet content, one thing is certain. That is, teachers will use your content in ways you did not intend. Yes, it is a bit frustrating that so much thought an planning went into creating a learning object, only to have it picked apart by a practicing teacher. However, the reality is that teachers will make use of your resources in ways that best suit their needs. So instead of resisting teacher modification, encourage it by allowing them to make changes to content that you provide.

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