A Pedagogy for Computer-Assisted Literary Analysis: Introducing *GALGO* (Golden Age Literature Glossary Online)

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Abstract

This paper describes a digital teaching application that approaches the study of language and literary works from a social semiotic perspective and represents an innovative pedagogical model for world language and literature classes. The Golden Age Literature Glossary Online, known by the acronym *GALGO*, consists of an online glossary of select keywords, from canonical texts of Golden Age Spanish literature, whose multiple connotations illuminate important linguistic and social concepts of the 16th and 17th centuries. *GALGO* incorporates British cultural historian Raymond Williams' methodology in his *Keywords: A Vocabulary of Culture and Society*: namely, identifying problem-laden words or "keywords," charting their distinct usages across texts, and reflecting critically on clusters of associated words. *GALGO* seeks to instantiate language as social semiotic by linking the semantic configurations of a literary work simultaneously to the cultural environment, the linguistic system, and the social system. Applying the conceptual design of M.A.K. Halliday's social semiotic model, *GALGO*'s interpretive apparatus provides the *field of discourse* or context of situation for the text in which a specific keyword appears. The *field of discourse* presents clusters, word groupings of semiotic affinity that describe the social action that is taking place in the text. *GALGO* also performs an interpretation of the *tenor of discourse*, highlighting sociological variables connected to class status, gender role and racial category that refine a keyword's meaning from the perspective of interpersonal relationships. Finally, *GALGO* adds *commentary* on discursive structures, such as patterns of grammar, syntactic nuances, and figurative language, that surround the keyword in the text.

GALGO's strength resides in the synchronic connectivity that the system facilitates when identifying the constellation of meanings for any given keyword. From a technical perspective, the system has the ability to efficiently identify the absolute position of all uses of a keyword across multiple texts, so that large texts can be managed and search times minimized for both users and system administrators. *GALGO* is constructed in such a way that users can not only access existing analysis within the database, but also can assume, when instructed to do so, the role of the system administrator and contribute their own annotations. A team of faculty and student administrators are currently building the database with research previously collected in Spanish Golden Age literature seminars. Providence College students have utilized the social semiotic methodology underlying *GALGO* for several years now with successful outcomes both in terms of their growth as language majors and critical thinkers.

"If teaching is largely about faculty-student interaction, then we have to recognize that human interaction is changing." [Bowen 2012, 49]

"New tools that foster new insights into work with the ever increasing amount of digital data available to us are not a luxury but a necessity: who better to develop them than humanists who have both a knowledge of the content domain and of the content as data." [Schreibman and Hanlon 2010, 41]

[1]

The dialogue between the digital and the humanities has not been fluid and continues to raise skepticism among a majority of humanists in this third decade since the advent of the field of Digital Humanities (DH). A primary concern is the ready appropriation of empiricist rather than humanistic methods of inquiry in the creation of DH tools. Johanna Drucker is among the most vocal in lamenting that computer generated humanities scholarship, by in large, seeks "positivistic, strictly quantitative, mechanistic, reductive and literal" scientific ends, and undermines the humanities' "constructivist approach to knowledge as knowing, observer dependent, emergent, and process-driven rather than entity-defined" [Drucker 2012]. DH scholars are creating, with powerful platforms that support large corpus processing, data mining and modeling, ever more complex and innovative projects that nonetheless mute, in Drucker's view, the core critical principles and affective experiences that have traditionally lay at the heart of work in the humanities.

[2]

The subject of this paper, *GALGO* (*Golden Age Literature Glossary Online*) was developed with a humanistic method of inquiry in mind and may resolve the issues raised by Drucker and offer new pedagogical insights into computer-assisted reading and analysis of texts. The potential benefits of the introduction of instructional platforms such as *GALGO* within the larger field of Digital Humanities, are multiple: 1) a wide variety of small scale digital text analysis projects, like those suggested on the MLA Commons site, "Literary Studies in the Digital Age," can be developed for classroom use and then elaborated on if proven to be of value, 2) students, more adept at using digital technology, will be able to contribute in significant ways to tool development [Clement 2013, 11] and to engage in professional scholarship mentored by faculty [Inman Berens 2014, 6–7], and 3) the role that the cultural canon performs within local and global societies can be more broadly and effectively explored, enabling the humanities discipline to undergo a much needed change.

[3]

In the domain of digital text analysis, Franco Moretti's celebrated "distant reading" model seems to bear out the same epistemological divide discussed above. Illuminating and potentially canon busting, the manipulation of massive datasets suggests more innovative means by which to evaluate formal and generic literary conventions, but involves "a little pact with the devil: we know how to read texts, now let's learn how not to read them" [Moretti 2013, 48]. At the same time a hybrid approach, that combines distant reading practices with close or "traditional" ones, as we adopted in *GALGO,* is spawning new non-empirical interpretive paradigms in which (machine) computational methods and (human) qualitative analyses interact dynamically to explore "new ways of reading or, just as important, new understandings of how we have always read" [Liu 2012, 14–15]. Web-based text analysis and visualization tools are being reimagined as vehicles that allow scholars to perform a range of hermeneutical and creative functions, from instantiating dominant literary-critical theories [[Ramsey and Rockwell 2012]; [Clement 2013]; [Olsen 1993-1994]] to "playing with" or altering a text's language and form [Sinclair 2003].

[4]

The impulse to bridge distant and close reading strategies emerges naturally in 21st century college and high school classrooms, where educators must respond to the ubiquitous use of technology by students, their shorter reading span [Hayles 2010] and their need for distraction. When genuinely affected by the material, today's learners also exhibit a capacity for disciplined reading and study, "Young people in online forums are engaging in close reading activities directed toward popular music or cult television shows sometimes engaging in prolonged and impassioned debate about what such works mean and how they convey their meanings" [Jenkins and Kelley 2013, 514]. The goal in the college classroom should not be to allow for open-ended digital play and exploration of the kind that professional humanities scholars are motivated to undertake, because as one learner noted, "The amount of information can truly be overwhelming, and a large part of the success of this exercise seems to lie in not only how to use the [digital] tools to the best advantage, but in…avoiding dead-ends" [Fyfe 2011, 87]. The pedagogical objective, then, is to foster curated opportunities for students in the humanities to engage in theoretically informed learning that takes full advantage of new media methods [Drucker 2012] [Brier 2012]. As instructors, we can play an important role in ensuring that they get a critical vocabulary for thinking about the intersections between media, language and culture [Jenkins and Kelley 2013, 639] and they interact with literary texts meaningfully.

In this paper we first introduce readers to *GALGO*'s social semiotic model for digital literary analysis, then we describe in detail *GALGO*'s technical apparatus and illustrate its functionality, and lastly we discuss multimodal literacy and reflect on *GALGO*'s potential to engage 21st century learners in classic literary analysis.

1. A Social Semiotic Model for Digital Literary Analysis: Accessing the Language of Golden Age Spanish Culture

With increasing frequency over the last decade, students in our foreign language literature classes remark that they often find it difficult to relate to terms and themes in the canonical works that they are studying since they perceive them as obsolete and irrelevant. Students want to read literature that reflects their concerns and that offers them ways to address those concerns from varied perspectives. The main pedagogical challenge, then, lies in guiding students to "see" the interconnectedness between early modern and contemporary language usage at the semantic and syntactic levels.

Our research has demonstrated that the keyword analysis developed by British cultural historian Raymond Williams provides a particularly amenable approach for engaging students in the study of foreign language and literature, honing in as it does on charged social and political terms that span societies and time periods [Alonso García and Caplan 2014]. Williams' methodology, namely, identifying problem-laden words or "keywords," interpreting their meanings in various contexts, and reflecting critically on clusters of associated words, serves to bring to the fore in any text an array of linguistic and historical questions to be researched and discussed. The keyword sociolinguistic framework allows for "an exploration of the vocabulary of a crucial area of social and cultural discussion, which has been inherited within precise historical and social conditions and which has to be made at once conscious and critical – subject to change as well as to continuity" [Williams 1983, 24]. Keywords are "large words" [Hart et al. 2005, 5] that are polysemic, used often and in at least two different situational contexts, and "patterned towards important social ends" [Halliday and Hasan 1989, vii]. For Williams, in the mid-20th century, they were: culture, society, democracy, class, etc. For students of Golden Age Spain, they tend to be moral and social terms inflected by the period's dominant philosophical concerns; for example, *fuerza* (1. *courage*, 2. *brute strength*, 3. *the force of truth*) and *gentileza* (1. *cultivated manner and appearance*, 2. *moral uprightness*). The polysemy of a word can be so extensive that it may include conflicting meanings as in *voluntad* (1. *the rational will, part of the human soul, that seeks the moral good*, 2. *free choice*, 3. *uncontrolled sexual desire*).

Undergirding William's keyword study is a social semiotic theory of language, which understands language as text delivered in a specific context of social interaction and constructed from linguistic codes derived from the culture [Halliday and Hasan 1989]. From this theoretical perspective, the situational context determines the text, and textual analysis should reflect a movement from the outside inwards: "We have taken as our starting point the observation that meanings are created by the social system and are exchanged by the members in the form of text…. Persistence and change in the social system are both reflected in text and brought about by means of text… text as the semantic process of social dynamics" [Halliday 1978, 141].

Yuri Lotman, in his groundbreaking work on a semiotic theory of culture, finds the language of literary texts to be the best vehicle for identifying specific semiotic codes prevalent among different social groups in different historical periods. "In the literary text there is an optimal correlation whereby the conflicting structures are disposed not hierarchically but dialogically on the same level. This is why a literary narrative is the most flexible and effective modeling mechanism for describing extremely complex structures and situations in their entirety" [Lotman 1990, 163]. Cultural semiotics justifies the study of the literary canon as a rich source of cultural memory, a portrait of the peculiar idiosyncrasy of an era, and an open examination of social and racial taboos. In the case of Spanish culture, reading Cervantes and his Golden Age contemporaries, bears this out: "*Los caracteres peculiares de nuestro idioma no han tenido manifestación literaria más amplia, varia y plena que en las obras cervantinas*" ("*The works of Cervantes exhibit the most sweeping, most varied, and fullest representation of the unique attributes of our language*") [Lapesa 1962, vii].

GALGO, an online glossary of select keywords from the Spanish Golden Age,[1] seeks to instantiate language as social

semiotic by linking the semantic configurations of a literary text simultaneously to the cultural environment, the linguistic system, and the social system [Halliday 1978, 142]. The computer is an ideal semiotic machine [Olsen 1993-1994, 313] to expose these overlapping layers of meaning. Applying the conceptual design of M.A.K. Halliday's social semiotic model, *GALGO*'s interpretive apparatus provides the *field of discourse* or context of situation for the text in which a specific keyword appears. The *field of discourse* presents clusters, word groupings of semiotic affinity that describe the social action that is taking place in the text. *GALGO* also performs an interpretation of the *tenor of discourse*, highlighting sociological variables connected to class status, gender role and racial category that refine a keyword's meaning from the perspective of interpersonal relationships. Finally, *GALGO* adds *commentary* on discursive structures, such as patterns of grammar, syntactic nuances, and figurative language, that surround the keyword in the text.

This method encourages students to unravel the cultural genealogy of pivotal terms that "resist easy signification" and whose lexical value(s) often differ from today's. All keyword definitions undergo a multilayered social semiotic analysis that can be compared and contrasted across texts: "You've got to see the text as an actualized potential; which means that you have got to study the potential…. We are interested in what a particular writer has written comparatively against the background of what he might have written, against the background of other things he has written or that other people have written" [Halliday 1978, 57–58]. In this way, *GALGO* guides learners to pursue the deep connections that exist between language, literature, and society.

2. The Digital Tool: Navigating *GALGO*[2]

GALGO's strength resides in the synchronic connectivity that the system facilitates when identifying the constellation of meanings for any given keyword. From a technical perspective, the database development has been a complex process, requiring multiple prototypes of the glossary and many iterations of interface applications. The system must have the ability to identify the absolute position of all uses of a keyword across multiple texts and perform this task in an efficient way, so that large texts can be managed and search times minimized for both users and system administrators. *GALGO* is constructed in such a way that users can not only access existing analysis within the database, but also can assume, when instructed to do so, the role of the system administrator and contribute their own annotations.

When a user logs on to read a particular literary work, the document is loaded first into a browser frame. Once the work is loaded, it opens the user side interface. The user interface is straightforward, so that one can quickly locate specific keywords in the work, view definitions, and visualize the web of semantic relationships that surround those keywords. A persistent navigation system lists the keywords in the database to the far right of the literary work and gives the multiple definitions for each word. There are hyperlinks to the 17th and 18th century Spanish dictionaries from which the definitions are taken and *GALGO*'s English translations are derived.[3] Figure 1 is a screenshot taken from *GALGO* that illustrates the multiple definitions for the keyword *honra*, its conjugations, under "Variations," in the *La Celestina* and links to all of the uses of *honra*. One can, at any time, browse a work by keyword, clicking on a specific instance through "Uses in this Work" and navigate to that textual location.

Figure 1.

Users can opt to read the entire work linearly, viewing it as a single continuous page. When they come to a highlighted keyword, they click on that word to see the specific contextualized definition. That specific definition is given, along with links to other places where that definition appears, both in the work being read as well as in other works in the database. The purpose of the glossary is not simply to trace the usage of a particular word but rather to trace the usage of a particular definition of a particular word across many texts. Figure 2 and Figure 3 show screenshots of the same definition for *honra* in two different works, *La Celestina* and *El Abencerraje*. Comparing these distinct analyses of the definition, by exploring "Other Places this Definition is Found," serves to expand and clarify its meaning for the reader.

Figure 2.

El Abencerraje · Honra · Use

Information
Keywords

manera que oirás. El Rey de Granada, por mejorar en cargo al alcaide de Cártama, envióle a mandar que luego dejase aquella **fuerza** y se fuese a Coín, que es aquel lugar frontero del vuestro, y que me dejase a mí en Cártama en poder del alcaide que a ella viniese. Sabida esta desastrada nueva por mi señora y por mí, juzgad vos, si algún tiempo fuisteis enamorado, lo que podríamos sentir. Juntámonos en un lugar secreto a llorar nuestro apartamiento. Yo la llamaba: «Señora mía, alma mía, solo bien mío», y otros dulces nombres que el amor me enseñaba. «Apartándose vuestra hermosura de mí, ¿ternéis alguna vez memoria de este vuestro captivo?» Aquí las lágrimas y sospiros atajaban las palabras. Yo, **esforzándome** para decir, malparía algunas razones turbadas de que no me acuerdo porque mi señora llevó mi memoria consigo. Pues ¡quién os contase las lástimas que ella hacía, aunque a mí siempre me parescían pocas! Decíame mil dulces palabras que hasta ahora me suenan en las orejas; y al fin, porque no nos sintiesen, despedímonos con muchas lágrimas y sollozos dejando cada uno al otro por prenda un abrazado, con un sospiro arrancado de las entrañas. Y porque ella me vio en tanta necesidad y con señales de muerte, me dijo: «Abindarráez, a mí se me sale el alma en apartarme de ti; y porque siento de ti lo mismo, yo quiero ser tuya hasta la muerte; tuyo es mi corazón, tuya es mi vida, mi **honra** y mi hacienda; y en testimonio de esto, llegada a Coín, donde ahora voy con mi padre, en teniendo lugar de hablarte o por ausencia o indisposición suya, que ya deseo, yo te avisaré. Irás donde yo estuviere y allí yo te daré lo que solamente llevo conmigo, debajo de nombre de esposo, que de otra suerte ni

Honra

Definition
Public esteem received by a woman in acknowledgment of her chastity and/or marital fidelity.

Field of Discourse
vida   hacienda

Tenor of Discourse
gender

Commentary
Here, in pledging "vida" and "hacienda" along with her "honra" a noblewoman was committing everything she was and had to her husband.

Other Places this Definition is Found

In "La Celestina"
- perdición yerro casa
- daño pía santa
- dañes palabras
- remedio temor libre
- dañe fama cuerpo

Figure 3.

GALGO's main feature is a powerful clustering analysis tool that allows users to see how a particular definition of a keyword is determined. A list of grouped terms given in the *field of discourse* reveals the pertinent vocabulary to focus on in and around the keyword. The analysis of the role relationships in a literary passage appears as the *tenor of discourse* identifying social discourse categories at play such as identity, class, ethnicity, or gender. Finally, the *commentary* box links form with content, deciphering the relevant rhetorical strategies. Figure 4, Figure 5 and Figure 6 offer views across different works that detail the interwoven strands of meaning.

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La Celestina · Honra · Use

Information
Keywords

CALISTO, PÁRMENO, SEMPRONIO.

CALISTO.- Hermanos míos, cien monedas di a la madre. ¿Hice bien?

SEMPRONIO.- ¡Ay!, ¡si hiciste bien! Allende de remediar tu vida, ganaste muy gran **honra.** ¿Y para qué es la fortuna favorable y próspera sino para servir a la **honra,** que es el mayor de los mundanos bienes? Que esto es premio y galardón de la virtud. Y por eso la damos a Dios, porque no tenemos mayor cosa que le dar. La mayor parte de la cual consiste en la liberalidad y franqueza. A ésta los duros tesoros comunicables la oscurecen y pierden y la magnificencia y liberalidad la ganan y subliman. ¿Qué aprovecha tener lo que se niega aprovechar? Sin duda te digo que mejor es el uso de las riquezas, que la posesión de ellas. ¡Oh qué glorioso es el dar! ¡Oh qué miserable es el recibir! Cuanto es mejor el acto que la posesión, tanto es más noble el dante que el recibiente. Entre los elementos, el fuego, por ser más activo, es más noble y en las esferas puesto en más noble lugar. Y dicen algunos que la nobleza es una alabanza, que proviene de los merecimientos y antigüedad de los padres; yo digo que la ajena luz nunca te hará claro, si la propia no tienes. Y por tanto, no te estimes en la claridad de tu padre, que tan magnífico fue; sino en la tuya. Y así se gana la **honra,** que es el mayor bien de los que son fuera de hombre. De lo cual no el malo, mas el bueno, como tú, es digno que tenga perfecta virtud. Y aun te digo que la virtud perfecta no pone que sea hecha con digno **honor.**

Honra

Definition
The act of bestowing or receiving favor, from someone of superior social status to an inferior.

Field of Discourse
vida   ganaste

Tenor of Discourse
class

Commentary
The servant notes the happy irony that in trying to improve his own life, his master has improved others.

Other Places this Definition is Found

In "La Celestina"
- gana bien virtud magnífico liberal
- mundanos bienes virtud liberalidad franqueza
- buen comer hacienda heredó holgar
- beneficios pagos
- amo rica ganancia

Figure 4.

19

TEÓGENES:

657 Yo desde aquí me ofrezco, si os parece
658 que puede de mi **esfuerzo** algo fiarse,
659 de salir a esta duda que se ofrece,
660 si por ventura viene a efetuarse.

CARAVINO:

661 Más **honra** tu valor claro merece;
662 bien pueden de tu **esfuerzo** confiarse
663 más difíciles cosas, y aun mayores,
664 por ser el que es mejor de los mejores.
665 Y pues tú ocupas el lugar primero
666 de la honra y valor con causa justa,
667 yo, que en todo me cuento por postrero,
668 quiero ser el heraldo de esta justa.

NUM. 1:

669 Pues yo con todo el pueblo me prefiero
670 hacer de lo que Júpiter más gusta,
671 que son los sacrificios y oblaciones,
672 si van con enmendados corazones.

NUM. 2:

La Numancia · Honra · Use   📰 Information
                                   ☰ Keywords

Honra

Definition
Public esteem received in acknowledgment of one's high moral and/or social status.

Field of Discourse
esfuerzo valor causa justa

Tenor of Discourse
gender

Commentary
One Numantine soldier rallies another with an appeal to his martial valor and the justness of their cause.

Other Places this Definition is Found

In "La Celestina"

- digno merecimiento
- discreción prudencia experiencia vida
- fortuna provecho
- cumbre crecer
- oficio nombre casa
- mansedumbre concesión inocencia
- posesión gloria riquezas

Figure 5.

Yo por bien tengo que cosas tan señaladas, y por ventura nunca oídas ni vistas, vengan a noticia de muchos y no se entierren en la sepultura del olvido, pues podría ser que alguno que las lea halle algo que le agrade, y a los que no ahondaren tanto los deleite. Y a este propósito dice Plinio que no hay libro, por malo que sea, que no tenga alguna cosa buena; mayormente que los gustos no son todos unos, mas lo que uno no come, otro se pierde por ello. Y así vemos cosas tenidas en poco de algunos, que de otros no lo son. Y esto para que ninguna cosa se debería romper ni echar a mal, si muy detestable no fuese, sino que a todos se comunicase, mayormente siendo sin perjuicio y pudiendo sacar de ella algún fruto. Porque, si así no fuese, muy pocos escribirían para uno solo, pues no se hace sin trabajo, y quieren, ya que lo pasan, ser recompensados, no con dineros, mas con que vean y lean sus obras y, si hay de qué, se las alaben. Y, a este propósito, dice Tulio: «La honra cría las artes».

¿Quién piensa que el soldado que es primero del escala tiene más aborrecido el vivir? No por cierto; mas el deseo de alabanza le hace ponerse al peligro; y así en las artes y letras es lo mismo. Predica muy bien el presentado y es hombre que desea mucho el provecho de las ánimas; mas pregunten a su merced si le pesa cuando le dicen: «¡Oh, qué maravillosamente lo ha hecho vuestra reverencia!». Justó muy ruinmente el señor don Fulano, y dio el sayete de armas al truhán, porque le loaba de haber llevado muy buenas lanzas: ¿qué hiciera si fuera verdad?

Lazarillo de Tormes · Honra · Use   📰 Information
                                            ☰ Keywords

Honra

Definition
The loss of public esteem because of one's pursuit of wealth.

Field of Discourse
recompensados dineros alaben artes

Tenor of Discourse
class

Commentary
The juxtaposition of "recompensados" and "alaben" with "dineros" demonstrates the importance of one's social reputation over one's actual economic status. Art is created, according to the narrator, not to gain wealth but rather to advance one's reputation.

Other Places this Definition is Found

In "La Celestina"

- provecho ganancia

Figure 6.

The process of data entry and keyword annotation has been successfully streamlined for system administrators in this current version of *GALGO*. To create a new text, all the administrator needs to do is fill out a simple web form, providing a title, specific metadata, and uploading a TEI XML encoded text file. Once uploaded, the text document is read into a buffer. The document is stored on the server in its unaltered state, so it can be used later as an inviolable document of record. The search index contains every keyword in the work and its absolute position in that work. Each word also contains an absolute unique identifier, allowing the system to quickly locate that word in every other work.

Administrators enter a keyword manually, and the application scans the document to find and highlight every instance of the keyword and prepares a list of those keywords in the database. When administrators click on an undefined usage, either in the document, or in the word use list, an editing interface opens. In this interface, a definition from a list of definitions already associated with the keyword can be selected, or a new definition can be entered. Upon submitting, the definition is associated with both the keyword itself and with the particular usage selected. The clustering tool allows administrators to annotate these definitions, explaining why certain word clusters are key to understanding the text,

referencing both field and tenor of discourse. A client side selection tool permits the administrators to determine the boundaries of the text by choosing neighboring terms to cluster with the keyword. These words, their position in the text, and the keyword itself together make up the field of discourse.

GALGO is comprised of a team of faculty and student administrators who are building the database with research previously collected in Spanish Golden Age literature seminars. Providence College students have utilized the social semiotic methodology underlying *GALGO* for several years now with successful outcomes both in terms of their growth as language majors and critical thinkers [Alonso García and Caplan 2014, 114–115]. Currently, the keyword analysis completed in these classes is being input, and following that work, the system will be expanded to include five additional literary works from the period and five new keywords. The project has received public recognition from Providence College, the digital humanities community, and the local Rhode Island Spanish-speaking media.[4]

Given that the sophisticated and powerful digital architecture behind *GALGO* can accommodate any set of works, whether in another language or another discipline, we are in the process of seeking feedback from a broader audience of colleagues and students. Focus groups will be conducted to test the platform's capabilities and discuss its applicability beyond the field of Spanish literary studies. The nature of *GALGO*'s new analytical and visualization functions will be impacted by the results of the focus group sessions. Future system development might include advanced language manipulation and search functions. In particular, it might include language specific stemming index algorithms that would make it possible to match natural language terms and clusters across multiple works. There could also be a quantitative facet to the cluster analysis that would determine the keyword's distributional profile[5] (DP) with respect to underlying semantic relationships. *GALGO*'s interface could be enhanced to provide dynamic views that reveal the distribution and intricacy of clustered lexical webs across any corpus.

3. Multimodal Literacy: Blending Old Literature with New Media

Students in the 21st century are equipped with a set of literacy skills, honed through their extensive interactions on social media, that enables them to communicate instantly with combinations of words, images, and videos. The intertextuality of messages and unlimited data stream as well as the participatory atmosphere of cyberspace have expanded the ways in which young people amass knowledge, understand concepts, and interact in the world. In their high school and college classes, the "Google Generation", inclined to interact with texts more freely, is reluctant to interpret meaning solely in the context of a single mode and expects to generate its own questions with respect to the subject matter [Calandra and Lee 2005] [Giglio and Venecek 2009]. Arguably, faculty today have the responsibility to meet students on their turf and honor their existing interests and expertise [Jenkins and Kelley 2013] to better support them in their long term intellectual pursuits [Bowen and Witthaus 2013].

An entirely new "textual landscape" has emerged as a result of "on screen" communication environments [Carrington 2005]. Just as occurred with the introduction of printing over five hundred years ago, information technology is spawning new practices of creating, reading, and interpreting texts. Digitized documents represent a vast expanse of varied data that can be instantaneously searched, sorted, and categorized. The theory of multimodal literacy [Kress and van Leeuwen 2001] [Kress 2003] posits that assimilating the semiotic resources of written language, audiovisual images, and interactive elements on screen is a distinct but not incompatible exercise from that of print-based reading and writing. "Textuality as such survives the technological revolution intact. Electronic technology does not replace the text but actually extends and supplements certain features of textuality by increasing our power to switch between texts of various kinds" [Harpham 2005, 24]. The interactive modality offered by the electronic medium has led to a form of reading coined "hyperreading," computer-assisted human reading that includes strategies such as skimming, hyperlinking, and scanning [Hayles 2010, 66]. Our digital tool, *GALGO*, is founded on hyperreading: "It enables a reader quickly to construct landscapes of associated research fields and subfields; it shows ranges of possibilities; it identifies texts and passages most relevant to a given query; and it easily juxtaposes many different texts and passages" [Hayles 2010, 66].

Nicholas Carr says this reliance on digital multimedia "disembodied" texts [Nicholas and Clark 2012, 97] is altering the depth not only of our thoughts but also of our emotions. Certainly, hyperreading has its fair share of detractors [Hayles

2010], and Carr is the most cogent voice in arguing that it spawns shallow thinking [Carr 2010]. But, in other significant ways, textual fragmentation captures what the study of language has always entailed: looking through language to the reality that it represents and looking at the language that represents it [Kramsch 2002]. By highlighting patterns, parallelisms, and intertextual juxtapositions, hyperreading draws on visual techniques used in viewing a painting [Kramsch 2002] and aligns well with the rich tradition of annotation found in cultural artifacts of earlier historical periods: "Before the mid 18th century, many Western readers, if they read at all, sampled from a variety of texts for which a linear reading would not be advisable: periodicals, almanacs, collections, the Bible…" [Jenkins and Kelley 2013, 2018].

[28] Multimodal learners employ hyperreading to navigate the Web according to their own interests and intuitively perceive reading and writing as social, cultural, and creative processes rather than simply as motor skills or linguistic acts [Gee 2010]. O'Halloran and Lim define the "multimodal literate" person as one who is "sensitized to the meaning potential and choices afforded in the production of the text, rendering an enhanced ability to make deliberate and effective choices in the construction and presentation of knowledge" [O'Halloran and Lim 2011, 4]. Technology offers opportunities for discourse analysis that the "fixity of one graphic representation-the printed page"[Jewitt 2005] cannot and frees the reader to create multiple paths and relate with the text in a personally meaningful way.

[29] We believe, then, that textual analysis in the digital era has the potential to connect readers in more direct ways with primary sources from the distant past. "By ensuring that close reading interacts synergistically with the kind of Web and hyperreading in which our young people are increasingly immersed" [Hayles 2010, 75], students of the humanities can surpass space and time boundaries and effectively activate the "meaning-generating mechanism" [Lotman 1990] of older canonical literature. "Text and readership seek mutual understanding. They 'adapt' to each other. A text behaves like a partner in dialogue: it re-orders itself (as far as its supply of structural indeterminacy allows) in the image of the readership. And the reader responds likewise, using his or her informational flexibility for the restructuring which will draw him or her closer to the world of the text" [Lotman 1990, 80].

Conclusion

[30] The vitality of literary classics depends on the ability and interest of each new generation of readers to participate actively in a process of continuous semantic (ex)change. In alignment with this objective, *GALGO* prioritizes two functions that other text analysis applications like Voyant [Sinclair 2016], NVivo software and Paper Machines do not: curation and contextual meaning. *GALGO* allows a professor to create a curated exhibit in order to help students see the ebb and flow of particular words throughout a set of works. Voyant, for example, is good at showing the usage cases of a particular word across a work, but there is no way for a student, encountering a complex work for the first time, to make semantic connections without help. Additionally, with *GALGO*, students can annotate a text themselves, and a professor can review their work, creating opportunities for guided self-discovery and in-depth conversation. These other tools do not afford this because they lack the capacity to promote genuine collaboration on research.

[31] Finally, *GALGO* allows a student to look beyond the word itself and trace contextual meaning, rather than just the word. A term is always connected to several different possible definitions. These other tools only show the uses of a particular word and do not help a student understand that the same word can mean very different things depending on the fields and tenors of discourse. It is unclear how useful it is just to see all the instances of a given word, especially for students with limited knowledge of a particular work, its period or even of the language in which it is written. By showing the range of definitions for the keywords and allowing students to browse by one or more definitions, *GALGO* exposes how the meanings of the keywords both recur and vary across texts.

Notes

[1] The first four works that have been input into the database are: *El Abencerraje. La historia de Abindarraez y la hermosa Jarifa*, *La Celestina*, *El Lazarillo de Tormes y de sus fortunas y adversidades*, and *La Numancia*. The first five keywords are: *esfuerzo*, *fuerza*, *gentileza*, *honra*, and *voluntad*.

[2] *GALGO* is under construction and can be accessed at http://glossary.mervideo.us/

[3] The *Tesoro de la lengua castellana o española* (*Treasure of the Castilian or Spanish Language*) by Sebastián de Covarrubias, published in 1611, can be found at http://fondosdigitales.us.es/fondos/libros/765/16/tesoro-de-la-lengua-castellana-o-espanola/, and the three-volume 18th-century *Diccionario de autoridades* (*Dictionary of the Royal Spanish Academy*) is located at http://web.frl.es/DA.html.

[4] Listen to the most recent interview with the authors and a student researcher on Rhode Island Latino Public Radio: http://lprnoticias.com/2016/05/13/podcats-galgo-providence-college-entrevista-con-el-dr-pablo-rodriguez/.

[5] According to the Distributional Hypothesis, the distributional profile (DP) of a word is determined by the strength of association of the word with co-occurring words in the text [[Rubenstein and Goodenough 1965]; [Schütze 1992]; [Pantel 2005]]

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