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Title: Create your own story: the need for a student-centred methodology in designing e-learning digital resources

Introduction

Extant e-learning resources presenting digitized rare books (e.g. Early English Books Online) and typed transcriptions of such works (e.g. Luminarium.org) rely on the passive, materials-centric delivery of texts to users. While such resources provide a wealth of material for users to plunder, they present simultaneously a potential information glut or “overload” (Gross, 1964) because (a) they do not offer opportunities for users to interact with their materials beyond downloading PDFs and (b) they lack advanced finding aids such as controlled vocabularies and thesauri. As such, on a fundamental level these e-resources of digitized and transcribed texts have done little to escape from luminary J. C. R. Licklider’s complaint against the “passivity” of the printed page per se in 1964 (pp.5-8).

In response to this passive approach, I created a new online resource targeted for English literature and History undergraduates and their instructors, the Early Modern Digital Classroom (EMDC), which uses transcribed selections from textbooks used by Milton and Shakespeare when they learnt how to read and write which modern students will now be able to use for themselves to learn the same analytical principles essentially alongside the famous authors whom they study. The pedagogical aim of the EMDC is to enable student-centred engagement with rare book materials to enhance their literacy, critical thinking, and analytical skills. Its critical aims are to argue for the need to embrace a user-centric rather than materials- or system-centric approach when creating digital learning resources by comparing its usability with that of two parallel early modern textual online resources, Early English Books Online, and Luminarium. Leading pedagogical innovator Carl Rogers argued that “the only learning which significantly influence[s] behavior is self-discovered, self-appropriated learning” (1969, p.166), and I argue for the need for librarians to embrace this student-centred strategy in designing digital learning resources.

Critical background: users in rare book literature

It is striking within archival and rare book literature that users of any stripe are seldom considered at all. I surveyed the most pivotal journal of rare book librarianship, RBM: A Journal of Rare Books, Manuscripts, and Cultural Heritage in which a paltry 6.9% of articles touched upon use of the materials. None of these articles took a user-centric approach, instead all putting the onus on taking the materials in question “on the road” as Anne Bahde puts it (2011, p.75) in a manner reminiscent of Elizabeth I embarking on a progress to see the luckier of her subjects. Stam (2006), Smith (2006), and Holzenburg (2006) have all argued for the need to incorporate rare books into a classroom environment, and Taraba (2003) and Alvarez (2006) have suggested means of doing so, but again very much working on the basis of displaying materials and letting materials take a journey rather than inviting users, whether students or faculty, to be the travelers in this voyage of discovery. Davison’s work (2009) offers a constructive overview of web-based

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1 The survey of RBM’s contents from the past ten years, of 115 articles only 8 even considered users, constituting 6.9%. However, as mentioned, 0 included any consideration of user-centric praxis, and there was no discussion of information-seeking behaviour of any user groups, let alone specific ones.
capabilities for outreach work in a digital rare book context, but even this prioritizes materials and the ways in which the Web can work for these, rather than considering a user-centric approach.

On the rare occasions when special collections literature contemplates student users, there is a disheartening chorus that such students are not ready to conduct any “original scholarship” (Byrd, 2001, p.165; Gilliland-Swateland, 1998, p.140). Even Gilliland-Swateland, a lone and innovative (though never emulated) champion of K-12 users of special collections argue for the need to focus on what “individual students… can, rather than what they cannot, achieve” (1998, p.140). Superficially, this might seem like a very positive, textbook example of student-centred behaviour, catering to an intellectual level of a given audience. However, therein lies its flaw: for it relies upon a generic assumption of potential student achievement in a given grade, age range, or level of study.

I take issue with such assumptions on the basis that they are fundamentally limiting to student achievement: for if a student could accomplish more than the assumed goal, they will not feel inclined nor be encouraged to exceed it, thereby underperforming; likewise, if a student struggles to attain the assumed goal, they may well feel defeated and not even manage to accomplish their own best work. Rogers argued that “significant learning takes place when the subject matter is perceived by the student as having relevance for his own purposes” (1969, p.158), and it is this type of student-centred approach which has guided the creation of the EMDC, founded on transparent learning goals which also form the guiding principles for the structure of the resource in a symbiosis which users can appreciate and learn from simul.

**User-centric design principles in LIS**

It is my contention in creating the EMDC that adopting a user-centric design process when constructing digital learning resources is a key way of enabling the productive pedagogical symbiosis between users and materials to gain optimal educational outcomes. Large and Beheshti (2000, 2005, 2011) are leaders in examining design approaches when building web portals for children, and in advocating for the utility of user-centred design principles in LIS contexts. Although the majority of their work has focused on a younger demographic than the main intended user group of the EMDC, their consistent findings of its efficacy among young learners lead me to suggest its potential in a postsecondary digital learning environment.

Whilst I agree with Large et al that the needs of a younger learning demographic have frequently been overlooked in user studies, I have to offer an alternative approach to the design process as an optimal means of achieving user-centred learning outcomes in a digital environment. Part of the discrepancy between their approach and mine stems from different originating interests: they are concerned with creating Web portals leading to multiple sources of information aimed at young children, whereas the EMDC is a prototype of an actual source of information and active learning primarily for older postsecondary students in a particular field. However, it also derives from a difference in objectives, in that they are concerned with the design process per se in terms of achieving useful search interfaces for children, whereas my project is concerned with the design process in terms of how it can enable specific learning outcomes in a way which is symbiotic with student learning procedures.

My approach in the EMDC is founded on Rogers’ more student-centric vision which prioritizes self-discovery, and which argues that students are most likely to strive to acquire skills which they can see are relevant to their own goals (1969, p.177; p.158). By making
potential learning outcomes of the EMDC transparently available to student users, it is my aim to enable them to invest in the learning process by acquiring a clear understanding of how it will benefit them in terms of thinking, writing, and analytical abilities. In this way, this approach also draws on ideas of intrinsic motivation (Deci, 1971 and 1975) which has been characterized as the strongest driving force enabling student learning (Small, Zakaria, and El-Figuigui, 2004; Weiler, 2004; Morrison, 2007).

Prioritizing users: the structure of the EMDC

It is particularly imperative to construct a design which avoids the pitfalls of information overload when making an online learning resource for student users who are already entering an unfamiliar environment.

This is especially critical in the context of encouraging and empowering new, young users who may be somewhat intimidated by the thought of libraries, especially rare book libraries, and it is crucial that the EMDC and other future resources take every step possible to make the information environment welcoming and more familiar to our future demographic. Limiting the scale of the EMDC’s capsule collection, focusing it on a specific theme of early modern discursive education, is a critical way of achieving this because the resource has pared down the information overload posed by a parallel resource such as Early English Books Online which has over 125,000 titles in its collection which can only be accessed via a very complicated, arcane search function.

This resource is a capsule collection of transcribed rare book materials from textbooks which Milton, Marvell, Shakespeare, and their literary peers used in school and university, which modern students and their teachers can access via the EMDC enabling them to learn the same precepts and apply these as a new means of understanding these authors at the centre of their curricula.

It consists of a home page which provides (a) a remit for the site and (b) navigation instructions detailing the function of the other four substantive sections, each of which can be found via persistent navigation tabs at the top of the site. The four sections consist of: (1) Bookshelf which houses the transcribed excerpted texts; (2) Commonplacing, an early modern term regarding the retrieval and compilation of ideas and texts, is where users can access the search function; (3) Scholars and Schoolmasters, which has biographies of both the writers of the logic texts on the EMDC and also some of the more prominent writers who used these; (4) Schoolhouse, which has information about the three main disciplines of the early modern period.

Nielsen and Molich (1990) champion user involvement and awareness of system processes, and by employing tabs which remain visible at all times regardless of which page a user is on, the EMDC aims to enable (a) users to retain clarity as to their own location within the resource, (b) to retain clarity as to the function of that part of the resource in relation to others, and (c) to be able to navigate to other parts of the resource easily, thereby enabling a high degree of what Nielsen and Molich term “user control and freedom” (1990, p.250). Similarly, to aid user

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2 EMDC homepage: [http://earlymoderndc.wordpress.com/](http://earlymoderndc.wordpress.com/)
3 EMDC Bookshelf: [http://earlymoderndc.wordpress.com/bookshelf-2/](http://earlymoderndc.wordpress.com/bookshelf-2/)
4 EMDC Commonplacing: [http://earlymoderndc.wordpress.com/commonplacing-2/](http://earlymoderndc.wordpress.com/commonplacing-2/)
5 EMDC Scholars and Schoolmasters: [http://earlymoderndc.wordpress.com/shakespeares-school-days-2/](http://earlymoderndc.wordpress.com/shakespeares-school-days-2/)
6 EMDC Schoolhouse: [http://earlymoderndc.wordpress.com/schoolhouse-2/](http://earlymoderndc.wordpress.com/schoolhouse-2/)
orientation and to enable users to become familiar with not only the site but also the early modern logical content which it conveys, terminology used in navigation, menus, and options is consistent within itself and derived from the nomenclature used in the texts which it showcases. Although this deviates slightly from Nielsen and Molich’s stipulation that a system “should speak the users’ language” in “familiar” terms, it is my own adaptation of their approach as a means of creating a link between users and materials. For users are furnished with the means of discovering what each term means, and then have to actually use this themselves to negotiate their way through the resource. In this way, active use of the resource stimulates the acquiring of the discursive cognitive processes which its texts set forth, thereby allowing a pedagogical symbiosis between user and material on the stage of learning and knowledge in the actual furniture of the digital environment.

Likewise in the section delineating biographical information about authors on the EMDC, it was important to select clear icons which indicate (a) that these are all the same type of digital object, but (b) that they are each representative of individuals and therefore differ when clicked. In this way both the verbal and the visual terminology used within the site aimed to embody Nielsen, Molich, and Krug’s principles of user-friendly usability by being clear, consistent, and not requiring overt cognitive processing which distracts from the site’s main pedagogical purpose.

**Users’ responses to the EMDC in usability testing**

To test the efficacy of this approach in its early stage as part of the MLIS, I designed a usability test comparing the EMDC to EEBO. I will outline two illustrative segments of results from the usability test which showcase comparative user responses to each resource to suggest the efficacy of the EMDC’s user-centric approach.

For the first task, users had to locate a specific book housed by both resources, *The Art of Logick* (1657) by Zachary Coke. The resounding response to this function in the EMDC by all users was that it was very simple to find this book by following the home page instructions. One commented that it was “terrifically easy to find” by “one simple click of the mouse”. Another observed that the “sub-sections” described on the home page “clearly identify where to find certain types of information”.

In EEBO, results were markedly different: one user did retrieve Coke’s text in a single hit by using the Author keyword, Subject keyword, and Title keyword search in combination with a date limiter of 1657, which they described as a “straightforward” search but one which was “more involved” than the EMDC, i.e. it required more cognitive effort, and needed “more information to be input”. This approach did elicit the correct volume, and demonstrates the utility of EEBO’s advanced search functions; however, the exertion which it requires from a user is not desirable in an e-learning context such as the EMDC, ideally, as all cognitive effort needs to go towards the subject itself, not its digital mechanics. Furthermore, this user was unusual: the majority of other users employed only the Author keyword search function which retrieved three results, with one person using the Author and Title keywords to achieve the same outcome. However, these results presented some confusion among users, for the first two are attributed to “Henry Ainsworth” but have the name “Zachary Coke” in their titles, whilst the third is denoted as being by Coke but is the first edition of the text from 1654, whereas what they had to seek was the second 1657 text. This led four users to conclude that EEBO did not have the text at all, and they abandoned their search without clicking on any of the results. The remaining five users all
made a pragmatic assumption that, as one of them put it, “the second Henry Ainsworth text, dated 1657 is the correct one”, though struggling to reconcile this with the fact that “the author on the title page is not consistent with the author listed by EEBO”. In fact, the Ainsworth listing by EEBO is based on outmoded critical claims that Ainsworth used “Zachary Coke” as a pseudonym to produce a vernacular logic text; however, as Hall (1970) and I (Wilson, 2010; Wilson, 2012) concur, Coke was an independent person who did indeed produce a logic text in 1657 which is the one displayed in EEBO. Thus everyone did in fact retrieve the text, though 40% did not realize that which is clearly a problem in terms of usability. Even one of the five who made a pragmatic assumption commented that they were “still not 100% sure it is the right book”, which suggests problems in this provision of information, especially in comparison to that of the EMDC.

Overall, users unanimously agreed that it was “easier to find the book in the EMDC”, principally on the basis that they only had to click rather than to type anything. One commented explicitly that this would be “great for students - - it avoids typos and misunderstanding!”

A second task which users had to complete was locating a technical term within Coke’s textbook, the “Cause Procatarctick”. Of the ten users, only four actually retrieved “The Cause Procatarctick” from page 52 of Coke’s text in EEBO. Three achieved this by locating the full text version of Coke’s work and searching it using “Control F”, and all admitted that they did this having failed to locate the usage from EEBO’s main search page via the Keyword search function. It is worth pointing out at this juncture that such a search can only be done if a user is aware that EEBO presents full-text transcriptions of its texts, and these are by no means entirely reliable as they are produced via Optical Character Recognition which often struggles to recognize either non-Roman characters or the blurred typography which is typical of many early modern texts. As such, this is a method which requires both a level of user expertise, and also a reliance on an essentially unreliable technological facet of the resource, rendering it less effective in a learning context in which users are inherently non-experts either in the subject or in using the resource.

The EMDC presented users with fewer problems in locating the term in Coke’s work, as they uniformly followed the instructions from the home page taking them to “Commonplacing”, from whence they clicked on either the alphabetic or hierarchical search option to reach the thesaurus, within which they all speedily located the term “procatarctic”. Two of the users who had successfully retrieved the term on EEBO noticed that in the EMDC it actually occurred in other places earlier in Coke’s text, i.e. at page 51 in Greek text prior to its Roman iteration on page 52. One observed that “I didn’t know that EEBO wasn’t searching Greek text” and this perceived lack of transparency shook some of their confidence in their search results on that resource. Certainly EEBO’s OCR seems to struggle with non-Roman characters, and in texts such as these which derive many of their terms from Greek texts, and that derivation is an important part of their intellectual significance, that is a major issue which the controlled vocabulary approach of the EMDC aimed to overcome.

In this section of the questionnaire, users made instructive feedback regarding future developments for the EMDC, as there was unanimous agreement on the “terrifically helpful” nature of having a complete list of other occurrences of a term. Five users stated that this would be “really handy” in a classroom setting because, as one put it, “students can see how all these books link up”. Similarly, eight commented that this would be useful for research in terms of displaying connections which are confirmed by the site’s own authority as a resource on early modern logic. One remarked that “this kind of connection might empower me to experiment with
logic in a conference paper, as I’d know I could be confident of my reference points in the landscape”.

**Conclusion: the future benefits of the EMDC’s user-centric approach and shareability features**

Overall, it appears from usability testing outcomes that the user-centric design and pedagogical philosophy of the EMDC has enabled it to emerge as a viable and useful new type of digital learning resource on the Web.

One key way in which the EMDC is able to achieve a higher degree of user-centrism is by focusing on learning outcomes throughout its design process: even the way in which it is constructed and furnishes links between the texts it contains is representative of the logical method which it propounds. Thus even by using the resource itself, especially once it has been expanded, users are in fact practicing the early modern logical methods which they are learning *simul*, and it is this symbiosis between users, materials, and ideas which makes the resource unique and gives it long-term potential as a digital learning resource in its own right.

Perhaps the most useful findings in terms of onward development for the EMDC, and features which distinguish it from its competitors, came in the observations by seven users of its capacity inviting users to share it through different social media platforms such as Twitter and Facebook. One user stated this “is a fantastic feature”, and one lacking in either competitor site. The praise of these features is instructive in supporting the EMDC’s future evolution into an active teaching tool which could be used as the hub for online instruction in an entirely digital context. Part of the long-term aims for the resource are to set up online classrooms within it including discussion fora based not only on text input but also audio and video links, and to begin Twitter feeds for different classes working with the EMDC. This kind of interactive outreach is critical in part in raising student investment in this kind of resource - - it is a way of converting an extrinsic motivator or prompt of a Tweet into an intrinsic motivator as the student actively wants to respond to a resource and an educator working within the aspects of a digital environment which they conventionally inhabit for extra-curricular purposes such as social media. If the EMDC and other parallel resources can harness the appeal held by social media platforms and channel these pedagogically, they will really have the power to make students invest in the learning process and for it to become an embedded part of their lives in a much more complete way than any physical classroom environment can, as the physical classroom has only three hours a week compared to the twenty-four-seven outreach ability of a digital environment.

**References**


