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**THE EXPLORATION AND DEVELOPMENT
OF TOOLS FOR ACTIVE READING
AND ELECTRONIC TEXTS**

Stephanie Faye Thomas

A thesis submitted in partial fulfilment
of the requirements of Sheffield Hallam University
for the degree of Doctor of Philosophy

July 2008

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Abstract

This thesis presents the results of research into the process of editing and the decisions faced by editors when approaching early modern texts. By looking at problems faced by editors of Renaissance texts, such as the difficulty of editing and presenting texts that exist in more than one version, for example Shakespeare's *King Lear*, it has enabled me to gain a better understanding of how these issues can be approached and how technology can assist in this.

The thesis outlines the areas of the domain into which research has been undertaken, those where it is currently being investigated, and those which may be explored in the future. A literature review of relevant texts has been included, as well as a review of some of the existing methods of viewing texts electronically. I have focused my practical research on how scholarly readers at Undergraduate level respond to being confronted with an unstable text. The term "Active Reading" is used in this case to refer to a level of dynamic involvement with the text, where editorial decision-making can affect the meaning of the text.

In observing the methods by which they currently examine and edit multiple-texts, I have been able to study readers and find out how they would like to be able to undertake this task using technology. I have utilized the knowledge gathered from this research to begin editing my own section of a Renaissance play using TEI XML, and to design some prototype editions of a Renaissance poem incorporating several interactive methods of engaging with multiple-text editions. I hope that by documenting the process of producing this work, as well as drawing conclusions from my findings from user trials, that this will contribute to new work in the development of electronic texts for literary readers.

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Undertaking this project has been a varied learning experience for me, and I am grateful to many academic colleagues who have contributed to my understanding through conferences, papers, and discussions.

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1 Introduction and Overview

This thesis has been submitted to Sheffield Hallam University in partial fulfilment of the requirements for the degree of Doctor of Philosophy. Its aim is to present a summary of the nature of research already completed and to indicate possible future developments in this area. The thesis includes background information on the research topic as a whole, in addition to a discussion of literature relevant to the area of research.

1.1 Introduction

The aims of the research are to improve the techniques currently employed in developing and presenting electronic editions of Renaissance texts, by producing examples for a new edition upon which future editions of other such works can be based. Currently no electronic edition exists that attempts to display the variants between multiple published editions of a set text and that allows for user interactions in editing the variants of this text. The purpose of generating examples from which a new edition could be produced is to:

- Produce a template from which future editions can be created;
- Enable students of literature to better understand both the editing process and the ways in which variations between different editions of a text can occur;
- Design an effective interaction mechanism and interface for the presentation of considerable amounts of text in combined form (that is, displaying more than one text on screen simultaneously).

Through the study of the editorial process, it is hoped that a better understanding can be gained of how decision-making in editing can completely transform the meaning of a text. In recent times there has been a backlash against editorial tradition, with editors becoming divided over whether it is appropriate to alter an "original" text or texts in any way, or whether the emphasis should be placed on the production of new editions, with the editor featuring almost as a secondary author to the work. Members of the literary community such as Randall McLeod are ambassadors for the belief that no two early modern printed texts are exactly the same, and that all texts of this period are therefore unstable. McLeod believes that "photography has killed editing"¹ and that there is no longer any rationale for editing and no point in producing critical editions.²

There is also the issue of multiple texts, and whether or not editors consider it appropriate to publish more than one version of a text. In the case of *King Lear*, two separate versions of the text exist which are generally conflated to produce one version (with notes on the text referring to other editions). Some texts are so different in fact that they contain the omission or addition of hundreds of lines, whole speeches, and even scenes³. An example that initiated considerable discussions within the literary community, in particular amongst subscribers of SHAKSPER,⁴ the Electronic Shakespeare

¹ W. Speed Hill, review of "Papers from 'New Directions in Textual Studies': The Harry Ransom Conference, University of Texas, 30 March-1 April 1989," in *TEXT* 6 (1994): 373, also cited in Reginald A. Foakes, review article "Shakespeare Editing and Textual Theory: A Rough Guide", *Huntingdon Library Quarterly* 60.4, 430.

² Reginald A. Foakes, "Shakespeare Editing and Textual Theory: A Rough Guide", *Huntingdon Library Quarterly* 60.4 (1997), 430.

³ Peter A. Donaldson, "Digital Archive as Expanded Text: Shakespeare and Electronic Textuality". *Electronic Text: Investigations in Method and Theory*. ed. Kathryn Sutherland, (Oxford: Clarendon Press, 1997), 183.

⁴ SHAKSPER The International electronic conference for Shakespeareans, <http://www.shaksper.net> (accessed June 15, 2008).

Conference, is that of the Arden third series edition of *Hamlet*, which promised to be the first major edition to split the play into its three versions.⁵

Producing an interactive text for reference and comparison between different published versions of a work carries a certain amount of responsibility towards the reader. The process of Active Reading is then as much about how much the reader wishes to engage with the text, and how simple and effective that text is to engage with. Through the use of hypertext as a medium in which to present literary texts, the occupation of the reader is becoming more and more akin to that of the editor, and indeed the writer.

As the percentage of people with the ability to produce hypertext content increases, as well as an increase in the frequency of Internet and computer usage amongst college and University students, the reader can no longer passively skim over the written word, but becomes increasingly more involved in the creative process of reading and understanding.⁶ Therefore, the effect of increasing readership of older literary works amongst young people may enable an understanding and enjoyment of a broader reading matter.

The Active Reading project is concerned primarily with looking at ways of displaying textual variants between several published editions of a text - in this case, two quartos (1608, 1619) and the folio text (1623) of *King Lear*. By combining these three editions it has been possible to examine textual

⁵ Colin Burrow, "Will the real Hamlet please stand up?" *The Times Online* (May 19 2002), also available: <http://www.unibas.ch/shine/editinghamlet.html#Arden> (accessed June 15, 2008).

⁶ Chris Roast, Innes Ritchie, and Stephanie Thomas. "Re-creating the Reader - Supporting Active Reading in Early Modern Literary Research". *Communications of the ACM* 45(10) (2002): 109.

variants independent from their respective edition, as well as looking at variants in the context of the play as a whole. The interactive nature of some of the prototypes produced for the project enables the user to “pick and choose” from the available variants, and produce their own version of a passage. In the following chapters I aim to demonstrate the issues associated with developing prototype editions of Sir Thomas Wyatt’s poem “They Flee From Me”, as well as an example of *King Lear* as a multiple text edition. The potential for an editing tool of this kind to be used as a device for both teaching and learning has been interesting to observe.

The work of the project is highly cross disciplinary, bridging the two cultures of Computing and English Literature. In order to work more or less equally between the two domains, I have found a common ground in examining editions as works in progress and as cultural artefacts, and by looking at electronic text as a means to deconstruct this notion. By researching both the editing process and the way readers interact with texts, it has been possible to record what is expected of an electronic scholarly edition to be used by undergraduate students. By producing a mental model of the elements users would require, it is then possible for the computing aspect to begin work on implementing these requirements.

At the forty-ninth Annual Conference of the Renaissance Society of America (RSA), I briefly demonstrated a prototype of an edition of Thomas Wyatt’s poem “They Flee From Me” in its eight available versions. This prototype and its subsequent versions have proved very interesting to observe when used in

conjunction with the teaching of the text. In observational studies of how the application was used, it has been possible to gain insights into how the use of technology in the English classroom can allow for greater collaboration between students, and between student and tutor.

I am most interested in how users/readers interact specifically with different interfaces – how they form their own conclusions about the texts/editions, using the available tool(s), and how they would *like* to be able to examine the texts. The value of finding different ways of interacting with texts, and of providing multiple published editions of a set text to study – such as the Quarto and Folio editions of *King Lear*, is important in allowing students to realise the instability of texts and the changing role of the editor. These are aspects which are covered by the MA English Studies module at Sheffield Hallam University entitled: “Editing a Renaissance Play: Electronic Editions”, the students of which have assisted me with generating requirements for the multiple-text e-edition.

1.2 The Research Field and Scope of the Project

Art and science are two different streams which flow from the same creative force and flow into the same ocean of common culture, but the currents of these two streams flow in different directions.⁷

⁷ Naum Gabo, “The Constructivist Idea in Art” in *Circle: International Survey Of Constructive Art*, eds. J. L. Martin, Ben Nicholson, and Naum Gabo, (London: Faber, 1937), 8, in Simon Biggs, “Culture, Technology and Creativity” (lecture, Institute of Contemporary Arts, London, 1991), <http://hosted.simonbiggs.easynet.co.uk/texts/culturetechnologycreativity.htm> (accessed June 15, 2008).

The interdisciplinary nature of Humanities Computing allows for collaborative experimentation by practitioners from many different domains. In some digital humanities fields the computing emphasis may be greater or lesser depending on the required outcomes of a particular project. Digital resources for use in education and scholarly work should be the method by which material is developed rather than a showcase for the technology itself, which is often the case in Arts subjects. "Across the disciplines of application, there are from the computational perspective three fundamental approaches.... *algorithmic... metatextual... presentational...*"⁸ It is possible to incorporate all three of these elements into the development of a text – to identify the way the text can be produced or reproduced, to describe the text, and to experiment with the appropriate presentation of that text.

Developers and designers of scholarly electronic editions are fortunate in that they can look to the users or readers of these editions for inspiration on how to create. The most fundamental aspect of developing an electronic application in particular for non-computing users, is that it is usable, not just that it should contain the wealth of information and material that we expect it to. The densest electronic edition imaginable can be a fascinating resource, but if it does not function easily, particularly in this case for use in teaching, then it is simply a historical artefact and not a usable, fluid, working example to be accessed alongside and in conjunction with the texts themselves.

⁸ Willard McCarty, "Humanities Computing As Interdiscipline". *Is Humanities Computing an Academic Discipline?*. The Institute for Advanced Technology in the Humanities (IATH), University of Virginia, 5 November 1999, <http://www.iath.virginia.edu/hcs/mccarty.html> (accessed June 15, 2008).

Renaissance texts can be found in electronic form across the Internet, and many are not on peer-reviewed sites. Digital copies of the works of Shakespeare typed out in HTML or scanned and saved as a PDF file have limited the reading choices available to subscribers of electronic texts. There seems little point in reproducing a Shakespearean text digitally for the sake of it, when so many other electronic mirrors of the text exist. What is the benefit in hundreds of institutions repeating the same task; of essentially making back-ups of the same text over and over? A novel method of digitally presenting text is to experiment with the format of the text, and to embrace the possibilities that this medium can offer.

Deconstructing wholly text-based material allows for the possibility of greater access and potentially fuller understanding for the reader. Encoding and storing it within Extensible Markup Language (XML) provides a method for which data can be shared between institutions with varying expectations for learning outcomes. By separating form from content, each institution can then experiment with the visual appearance of the text, and each user can decide for themselves the way they wish to be able to read that text, or the tools they select to help them understand the content.

2 Editing and Multiple Texts

2.1 The Editing Process

2.1.1 To Edit or Not to Edit – The Role of the Editor

It has long been debated whether to edit a text is necessarily a valuable action. Opinions within the literary community differ widely on this issue, from those such as Randall McLeod who believe that texts should not be interfered with in any way, to those such as David Scott Kastan who observes that editing is a “hot topic”⁹ and one which the academic community appear to be embracing in increasing numbers thanks to the influx of hypertext and hypertext editing packages.

The modern role of the editor could be considered to be somewhat of a balancing act – to attempt to reconstruct an original text, but also to produce an edition of the text that could be more accessible for reading purposes and possibly for use in performance. It is important therefore to establish a task model for the role of editor. Does one task specifically affect another? How complex are the tasks that editors undertake? Are they well supported? In modernising texts it is important to consider: “It is essential that, in reading literature of any period, we engage with the language of the time as far as we can, even if it is impossible for us to reconstruct exactly how it was spoken or interpreted.”¹⁰ By modernising a text, it is imperative that none of the original features or meaning be lost due to modernisation of sense or dialogue.

⁹ David Scott Kastan, *Shakespeare After Theory* (London: Routledge, 1999), 30.

¹⁰ Silvia Adamson, Lynette Hunter, Lynne Magnusson, Ann Thompson, and Katie Wales, *Reading Shakespeare's Dramatic Language: A Guide*. (London: Arden, 2001), 191.

In researching and investigating different editing processes, in addition to evaluating existing models of editing (both on paper and on the screen), a preliminary model of editing can begin to be moulded. Models of editing examined include that offered by Richard Proudfoot: "(The model) edition would combine facsimile and modernised texts within a single volume, arranging them in parallel on facing pages and supplying each with its own kind of commentary."¹¹ The ideal model for producing an electronic edition and for this project specifically would be divided into six areas: 1) encoding, 2) evaluation, 3) refining of existing application, 4) further evaluation, 5) analysis, and 6) publication of the edition.

2.1.2 Editing and Responsibility

With editing comes responsibility – the responsibility of fulfilling the expectation(s) of the reader, of fulfilling your own expectations for the piece you are editing, and of course, most importantly for the majority of editors, fulfilling the author's original intentions for the piece as adequately as possible. Not everyone can become a professional editor, though there is no reason why they cannot undertake editing tasks for the purposes of aiding their own understanding of a text. Taking on the role of editor of a document or text can help a reader to experience a deeper consideration of the piece, and hopefully, this further engagement with the text will allow them to reach a better understanding of the work as a whole.

¹¹ Richard Proudfoot, "New Conservatism and the Theatrical Text: Editing Shakespeare for the third millennium", in *The Shakespeare International Yearbook: 2: Where Are We Now in Shakespearean Studies?*, ed. William R. Elton and John M. Mucciolo (Aldershot: Ashgate Publishing Ltd, 2002), 140.

This view is supported by David Scott Kastan, in his article "The Mechanics of Culture: Editing Shakespeare Today"¹². Kastan identifies modern editing as a highly popular activity which many people want to attempt no matter how qualified they are to do so. "For years, we just read whatever edition we happened to have at hand, confident that the text was accurate and authoritative."¹³ This quotation highlights even more so the importance of being able to distinguish between versions of a text, and to be presented with a choice as to which edition to select.

The sheer number of editions of certain specific texts is testament to the concept Martin Spevack¹⁴ refers to as "me-tooism" – the constant need for editors to produce their own personal edition of a text. In his article "The End of Editing Shakespeare"¹⁵ Spevack casts an eye over the sheer number of Shakespeare editions to have been produced over the last sixty or so years. He is of the same view as Kastan; that "...the way is being cleared for Everyman and Everywoman turning editor"¹⁶

All editors are, or try to be, collaborators. The traditional role of the editor has been to recover the author's text from the corruptions of the printing house, and thereby restore the author's linguistic and lexical intentions.¹⁷

¹² David Scott Kastan, *Shakespeare After Theory* (London: Routledge, 1999), 30.

¹³ Ibid., 31.

¹⁴ Martin Spevack. "The End of Editing Shakespeare", *Connotations* 6.1 (1996-7): 78.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Antony Hammond, "The Noisy Comma: Searching for the Signal in Renaissance Dramatic Texts", in *Crisis in Editing: Texts of the English Renaissance*, ed. Randall M Leod (New York: AMS Press Inc., 1994), 235.

Editing, through the passage of time, has progressed considerably from Shakespeare's day. Modern editors can hopefully assume that, for the most part, the need to "recover the author's text from the corruptions of the printing house"¹⁸ is not of immediate concern to them, considering the plethora of editions that have been created dealing with this issue. Stanley Wells, however, can see "no worthwhile future in the editing of Shakespeare unless reasoned decisions are permitted to take precedence over the claims of tradition."¹⁹

Shakespeare's plays in particular are read and used in performance by so many different people, for a variety of purposes – whether it be for teaching as part of the curriculum in schools, as a script for use in play productions, or simply just for enjoyment. An editor producing a general edition of a play for a non-specific reader-base, would have to take all these areas into consideration.

There appears to be a whole new breed of modern editor; one who has become educated on their chosen topic or text through the consultation of the many editions preceding them. They no longer appear to be so concerned with restoring "the author's linguistic and lexical intentions"²⁰, but rather more with uncovering some new or previously undiscovered element of the text so far along the line, that it would necessitate a new edition being produced. It seems that in trying to dissect a text to be edited, editors over the years have

¹⁸ Ibid., 235.

¹⁹ Stanley Wells, *Re-Editing Shakespeare for the Modern Reader* (Oxford: Clarendon Press, 1984), 30.

²⁰ Hammond, "The Noisy Comma", 235.

made it increasingly difficult for themselves by basing their editorial decisions on those already made by others, as opposed to basing them on the earliest surviving text or texts and forming fresh opinions. Wells again notes:

It is proper that texts should be freshly examined from time to time in the light of the latest scholarship, but it would be dishonest of an editor to make changes merely so that his edition would be different from someone else's.²¹

Modern editors appear to have adopted the rule that, by providing copious textual notes giving alternatives to the text provided, there is less of a need to reproduce features of the original text itself. "...a modern editor will totally replace with modern equivalents many features of the copy-text (such as page-length, stick-width, and so on)."²² An "original" text can therefore never be reproduced completely for modern readers in its original printed format. Printing formats are different today, the size of the pages themselves are of a different scale, due to the popularity of the modern Duodecimo page size of the modern paperback book. The average size of computer monitor screens on the other hand, is a new and different matter to be addressed for the future of editing and publishing.

W. Speed Hill presents two extreme views of the editor in modern times in his article "Where We Are and How We Got Here: Editing after

²¹ Wells, *Re-Editing Shakespeare for the Modern Reader*, 3.

²² Hammond, "The Noisy Comma", 239.

Poststructuralism”.²³ There are those who believe “the-best-editor-is-a-dead-editor”,²⁴ who find any kind of alteration to the original text or texts as being “parasites on an authorial host.”²⁵ Randall McLeod is one who follows this extreme belief in refraining from editing totally if at all possible. There are also those who preach the positive features of hypertext, seeing “its web-structure(s) as the electronic embodiment of poststructuralist visions of the work as a node within a web of intertextuality...”²⁶ This idea leads to issues associated with publishing a text electronically, and the fact that, at the click of a button (or link), the reader can move from a text by one author, to another by a second author – virtually merging the two texts together, through the use of hyperlinks.

A new electronic edition is exactly this, a “new” presentation of the material. It is important that a new edition has individualism, and an originality of its own with which to present the material. The principal way to identify a newly created edition is to recognise that it has an editor who is an individual (or a series of editors). By doing this, it is clear that this editor (or editors) will have left their mark on the text, and will have formulated the original text or texts in their own style – perhaps modernising spelling or punctuation, or altering the layout of the text on the page or screen. It is therefore important to determine what the role of an editor is, and how much of a responsibility they hold with regard to adhering to knowledge (if any) of the author (or authors’) original intentions for the text.

²³ W. Speed Hill. “Where We Are and How We Got Here: Editing after Poststructuralism”, *Shakespeare Studies* 24 (1996): 38-46.

²⁴ *Ibid.*, 40.

²⁵ *Ibid.*

²⁶ *Ibid.*

Peter Robinson discusses the role of the editor with regard to the impact of computers on textual editing:

At this moment in the history of editing as the old gives way to the new, the editor must be a collaborator: part of a shared enterprise...We are part of a floating world-wide conversation about editing and computers.²⁷

Robinson sees the editor of electronic texts as having the shared responsibility of being a scholar and a developer, as well as a communicator. He recognizes the need for the editor to be a collaborator, sharing in the experience of the text and its creation.

2.2 Producing New Editions

My advantage as a “common reader”; one who approaches the text from a multi-disciplinary background as opposed to that of a strictly literary scholar, has enabled me to be more objective when considering editing, than an expert reader of a specific text might have been. Whilst editing I have not experienced a strong obligation to stay true to any of the authorial intentions for the text, as in many cases these would prove difficult to realise. My aims are to recreate as simply as possible any and all available versions of a text in order to provide a choice for the reader, rather than limiting them by the choices that would’ve been made for them by an editor – an “editorial avoidance” of sorts.

²⁷ Peter Robinson, “New Directions in Critical Editing”, *Electronic Text: Investigations in Method and Theory*. ed. Kathryn Sutherland, (Oxford: Clarendon Press, 1997), 146.

There are a number of questions to be addressed when considering producing a new edition of a text. Should the process of reading (how the reader reads) have an impact on how the material is presented? Is it acceptable to change the format from that of a paper-based text, to one that is perhaps more suited for a particular audience or reader? This last question is particularly pertinent in the realm of the electronic literary edition, as the format of an originally “paper-based” play such as *King Lear*, would be completely transformed into an online and intangible copy of the play.

2.2.1 Tools for effective editing (print and online)

The tools an editor must equip themselves with in order to edit effectively for both print and online documents can be very different, although they have many base similarities.

- **Objectivity** is an important trait when considering undertaking editing of any kind, whether it is of a newspaper story, a film, or indeed of a new online edition of a play.
- **Familiarity** with the subject material being edited.
- **Sensitivity** for the way the text is manipulated and presented, and for the needs of the reader, particularly if it is to be a scholarly edition.

Objectivity is probably one of the more difficult skills to possess, as each editor will bring their own bias to the material whether or not they are conscious of this. Familiarity with the subject matter and any resultant

preferences in this case can also be a disadvantage when it comes to being objective. Sensitivity for the needs of the reader is possibly the most important factor when considering the appearance and functionality of an online edition.

2.2.2 Stage Directions

“Since stage-directions and the rest were often suspected of originating with someone other than the author, editors tended unconsciously to accord a lower textual status to them”.²⁸ This is an example of an editor taking temporary ownership of a text – a simple decision, based on what could have been misconceived ideas about authorship, can lead to an original text being altered seemingly forever, until another editing decision is made, perhaps years later, and the ideas become of importance again. It is important when presenting a number of versions of a text (in my case, electronically), to maintain a consistent format for displaying stage directions, regardless of the specific edition being displayed. This will enable readers to navigate easily between versions, with minimal disorientation.

2.2.3 Accidentals and Substantives

An interesting area of editing concerns that of accidental and substantive variants, and whether an element does or does not belong to the original text with regard to meaning; if an editing decision was conscious or simply a slip of the pen or typesetting error. “If the punctuation is persistently erroneous or defective an editor may prefer to discard it altogether to make way for one of

²⁸ Hammond, “The Noisy Comma”, 204.

his own.”²⁹ This is another danger of editing – that the editor has the power to change the author’s text in this way. Subsequent generations of readers may not have been able to access the pre-edited material, and the history of that text could have been altered incorrectly.

2.2.4 Clarity/ Noise

A major issue for modern editors attempting to edit from older editions of a text, such as Shakespearean plays, is the “noise” factor. By this I mean that early texts can have very cluttered content on their pages, many of which may be handwritten in ink, or printed using relatively primitive methods by today’s standards. This must firstly have caused problems for the printers and typesetters if they were working from rough copies of the text or foul papers, as they would probably have had difficulty deciphering the manuscripts due to this lack of clarity, and might therefore have printed incorrect information.

The difficulties for modern editors editing older material such as this is much the same, but they do not just have unclear handwritten documents to contend with, but also printing idiosyncrasies, as well as any mistakes in their own readings of what they perceive to be the text. For example, the printing of sentence fragments by mistaking colons for commas.

The arrival of the computing age has done little to alleviate the problem of noise either, as techniques such as OCR (Optical Character Recognition) were still unable to distinguish certain elements from others. OCR is the

²⁹ W. W. Greg, “The Rationale of Copy-Text”, in *Collected Papers*, ed. J. C. Maxwell. (Oxford: Clarendon Press, 1966), 385.

recognition of printed or written text characters by a computer, whereby the text is scanned in character by character; the resulting scanned image is then analysed, and the character images are then translated into character codes, such as ASCII (the most common format for computer-based text files)³⁰. "Give a Kurzweil OCR a page from a seventeenth-century text, and it is likely to be able to read only 40% - 60% of the signs on that page correctly."³¹

However, the readers/ users of future electronic editions of these works will almost certainly have no such problems with clarity of page and text, as 1) all editions will have the capability to be able to be produced using the same font face or font size if desired, and 2) users may be able to edit the material on screen themselves if it is found to be incorrect or differing from the original version of that text. The second wave of the World Wide Web, Web 2.0 allows for many such folksonomic activities – such as the mass editing and tagging of sites such as Wikipedia.

2.2.5 Authorship and authenticity

Many modern editors feel the need to attribute a text to one specific author. They are unable to accept that the work simply exists, but must be able to recognise the style of a particular playwright or writer within it. One reason for the need to attribute a text to a certain author is the popularity of specific authors or playwrights amongst readers. For example, if another proven Shakespeare manuscript were to be uncovered, the attention from the

³⁰ Whatis.com definition of "OCR", http://whatis.techtarget.com/definition/0,,sid9_gci214132,00.html (accessed 15 June 15, 2008).

³¹ Hammond, "The Noisy Comma", 239.

academic and theatrical worlds would be unprecedented. More information could be extracted about meaning in the text based on biographical knowledge of that author, or used to draw historical conclusions from the content based on other known works by that author.

If it was possible for an editor or bibliographer to reveal the authentic writer or author of a work, then the task of editing a text might also be simplified, and connections more easily made between this and other texts. Editors can compare chosen texts with other previous works by that author, and base their editing decisions upon this; they could calculate for example the number of occasions in the text where an element appears, or a trait of its author can be identified. Computer programs exist designed for just this purpose – keeping a record of all the instances of specific words in a text. Modern editing, therefore, can probably be described as being more about adding to existing material and keeping records of versions of texts, than of excluding written matter or anything else.

“Neither the Folio nor the quarto texts of Shakespeare’s plays bear the seal of final authorial intention, the mark of decisive closure that has served, at least ideally, as the guarantee of textual authenticity.”³² Can editors ever hope to reproduce or recreate Shakespeare’s plays, as they would originally have existed? “...it becomes clear that no decision about the presentation of a literary work can be made that does not involve some loss of desirable

³² Stephen Greenblatt, et al., eds., *The Norton Shakespeare*, (London & New York: Norton, 1997), 67.

information.”³³ This idea also relates back to McLeod’s theories that all editing is tampering with the original text or texts in some way.

Kastan agrees that the problem over the issue of “authorship” in modern times, is that it is no longer concerned simply with an individual, but more so with the process of authoring, collaborators, methodologies, and the “network” or “pathway” through which a text came into existence. Editors and bibliographers are constantly seeking to find the source of all references made by an author, and seeking to attribute works to them, which are purportedly produced in the writer’s style.

“For many years it was thought that Shakespeare himself did little or no revising.”³⁴ However, it is now thought that he did in fact make many revisions, and that his play scripts were in fact more like “open texts,” and that “...the playwright and his company expected to add, cut, and rewrite as the occasion demanded.”³⁵ This leaves a problem for the editor of a “definitive” Shakespeare edition, as he or she will never be able to find a “perfect” or “final” copy of the play from which to work, and will therefore never be able to generate a “final” copy of their new edition.

By creating and editing electronic scholarly editions we seem to be getting even further away from the original text or texts. “Many modern readers of Shakespeare, particularly younger readers...probably have little idea of what

³³ Kastan, *Shakespeare After Theory*, 36.

³⁴ Greenblatt, *The Norton Shakespeare*, 67.

³⁵ Ibid.

a sixteenth-century printed play text actually looked like.”³⁶ Therefore, by making plays more accessible to these readers by incorporating technology into the reading experience, are we not making the original physical texts appear more distant from them and more inaccessible again?

“Increasingly textual criticism, if not editing itself, has attempted to uncover the full network of agency involved in the production of the text, restoring the literary work to the collaborative economies necessary for its realisation.”³⁷ Working on developing new ways of reading texts will allow for the focus to be more upon the text as a historical work of literature; enabling, through interactivity, a greater understanding of the textual variants between versions and the possible reasoning behind authorial and editorial decisions. The aim of this project is not to provide a timeline for bibliographers to trace every addition and deletion within the text; the emphasis is instead on scholarly understanding of the creation of one text, the result of which could be applied to many other texts.

2.3 An Introduction to problems of Multiple Text Editions

2.3.1 Multiple Text Editions in Shakespeare

For many years editors have approached Shakespeare plays, confident that they were enhancing a text that was relatively stable and that had altered very little from the early days of its production. They had no awareness that the

³⁶ Graham Holderness, *Cultural Shakespeare: Essays in the Shakespeare Myth*, (Hatfield: University of Hertfordshire Press, 2001), 111.

³⁷ Kastan, *Shakespeare After Theory*, 34.

plays themselves would turn out to be the subject of debate over whether each was not one play, but actually two.

An entire publication entitled *The Division of the Kingdoms: Shakespeare's Two Versions of King Lear*, is devoted to essays supporting the hypothesis that *King Lear* was not one play but in fact two separate plays, and that "...both texts represent independent Shakespearian versions of *King Lear*..."³⁸

Steven Urkowitz suggests that:

The agent most likely to have produced the spelling, spacing, lineation, textual illegibility, verbal structures, patterns of dialogue, and dramatic designs in the Quarto of *King Lear* is Shakespeare himself.³⁹

However, since the 1980s it has been argued that conflated editions of the text(s) of *King Lear* were not providing a clear view of the "real" text at all. Instead, the thinking was that there were two distinct texts; an original published in 1608 as *The History of King Lear*, and a second revised version, published in 1623 as *The Tragedy of King Lear*. The *History* has around 300 lines which are not present in the Folio, the *Tragedy* has about 100 lines not found in Q1. The overall difference in length between the two versions is clear with 3,100 lines of Q1, and only 2,900 lines of the Folio⁴⁰.

³⁸ Gary Taylor and Michael Warren, "Preface", *The Division of the Kingdoms: Shakespeare's Two Versions of King Lear*, eds. Gary Taylor and Michael Warren (Oxford: Clarendon Press, 1982), v.

³⁹ Steven Urkowitz, *Shakespeare's Revision of King Lear* (Princeton: Princeton University Press, 1980), 140.

⁴⁰ Lucas Erne, *Shakespeare as Literary Dramatist*. (Cambridge: Cambridge University Press, 2003), 184.

Although scholars in the 1980s established that the Quarto and Folio versions of *King Lear* were substantively different texts, interest in such variation was quelled by "revisionist" critics assuming "to revise" simply meant "to perfect," so that they deemed the Quarto a failed attempt to produce the supposedly more refined Folio.⁴¹

Length of text is not the only problematic aspect of having two versions of a text. Between these two versions of *Lear* "several speeches are differently assigned; and there are more than 850 verbal variants, some of them obviously the correct version of manifest errors in the Quarto, others offering an alternative sense."⁴²

"By including two texts of *King Lear*, the Oxford Complete Works became the first major edition to apply the two-text theory in editorial practice"⁴³. Similarly, the Norton edition of Shakespeare is based on the Oxford edition; it too contains three texts of *Lear*: *The History of King Lear* (1608), *The Tragedy of King Lear* (1623), and a conflation version. Many other editions have also been published which seek to present all major versions of the text, rather than limiting the reader to one conflated text constructed by an editor.

As I mentioned in Chapter 1, a recent and contentious discussion along similar lines is that of the publication in 2006 by Arden of their third edition of

⁴¹ Robert B. Hornback, "The Fool in Quarto and Folio *King Lear*". *English Literary Renaissance* 34 (3) (2004): 306-338.

⁴² Stanley Wells, "The Once and Future *King Lear*", in *The Division of the Kingdoms*, 6.

⁴³ Lucas Erne, *Shakespeare as Literary Dramatist*, 184.

Hamlet. An illustration of some of the problems arising from multiple textual versions is in Colin Burrow's discussion of the excerpts from *Hamlet* below:

...everybody knows Hamlet says "To be or not to be, that is the question", and "To sleep, perchance to dream. Ay, there's the rub". Except in one version of the play he doesn't say either of these things. He says: "To be, or not to be, ay, there's the point,/To die, to sleep, is that all? Ay, all: / No, to sleep, to dream; ay, marry there it goes". And instead of dying with "The rest is silence", in one version he ends: "The rest is silence. O, o, o".⁴⁴

2.3.2 Variants

By looking at the possible variants that could exist between published versions of a work, it is apparent how potential mistakes and textual peculiarities could have come to exist between several editions of a published work. In particular, by looking at variants of spelling and punctuation, it has been possible to distinguish between different edited versions and the possible reasons for these differences.

Individual editors choose to deal with variations between texts in certain specific ways. If no methodology of this specific editing process is kept, it would then be the task of future editors to decipher the reasoning by which they had included certain features, but excluded others. In addition there is the problem of completely unedited texts, where errors and ambiguities may

⁴⁴ Colin Burrow, "Will the real Hamlet please stand up?" *The Times Online* (May 19 2002), also available: <http://www.unibas.ch/shine/editinghamlet.html#Arden> (accessed June 15, 2008).

have occurred due to any number of reasons during the printing process, or during transcription, and have not been documented.

Through the encoding of Act I of the three texts of *King Lear* I have found that the majority of the time Q1 and Q2 have the most similar variants, but occasionally Q2 and F appear to have more similarities in spelling and so on. Obviously there are major textual differences between the editions – the quartos contain around 300 lines which are not to be found in the folio, and in turn, the folio contains 100 lines not present in either of the two quartos.

Changes in the character name reading the same part are also present, for example in line 204 of the quartos the part is read by Gloucester, but in the folio it is Cordelia / Cornwall. This kind of variant could have a major impact on the meaning of the text and the action within a scene.

2.4 Electronic Editions and Hypertext

The use of hypertext in the creation of new editions and for the purpose of editing in general has been aimed at making texts more available and more accessible by a wide range of readers. The possibilities of creating new online material encoding three versions of a text such as *King Lear* could contribute to the beginning of a whole new way of reading, editing, and cross-referencing textual material.

Instead of having to sift through many reams of different paper versions of a text, the reader or editor could view all the versions online, and perhaps even

combine these versions to illustrate aspects such as differences (variants) in the text. As well as saving an immense amount of time, hypertext allows us to explore parallels between works that we might not have discovered given the same amount of time, and cross-referencing is immediate.

“With hypertext, however, Everyman/ Everywoman – or shall we say, Hyperperson – is invited to become editor: Hyperperson, rear’d arm poised with mouse, in his livery floppy disks and manuals.”⁴⁵ In an amusing, yet rather outdated view of the users and creators of today’s electronic editions, Martin Spevack makes clear his opinion of the amateur electronic editor. He appears to support the view that hypertext, although having many uses, is too vast and perhaps “gimmicky” to have a long-term future in the editing of texts. He adds: “Editing Shakespeare has become in certain areas inforentertainment, in the manner of hypertext.”⁴⁶

He describes the wealth of information that can be enabled by the use of a hypertext system as leading “...to a traffic jam, with standstill.”⁴⁷ Having too many options is not always a good thing, and no matter how good the intentions of the editor of the edition, the outcome for the user may still ultimately be confusion. This is true to a certain extent, but provided the user/ reader can be supplied with suitable directions and constraints within the edition, any possibility of “information overload” can be avoided.

⁴⁵ Spevack, “The End of Editing Shakespeare”, 81.

⁴⁶ Ibid., 82.

⁴⁷ Ibid., 81.

Much can be taken from existing research into what a definitive electronic scholarly edition should and can encompass. Peter Shillingsburg presents his own set of eight general principles for electronic scholarly editions:

- (i) Usability;
- (ii) Transportability;
- (iii) Archive specifications;
- (iv) Security and order;
- (v) Integrity;
- (vi) Expandability;
- (vii) Printability;
- (viii) User friendly.⁴⁸

These principles can be very useful for defining a framework specific to this thesis, and can help in creating an independent set of guidelines for an edition concerned primarily with the presentation of textual variants and versions. Of course these principles are not all relevant to the area of concern, and therefore each must be considered carefully with regard to what the edition should contain. (see also Appendix 1.1 for Shillingsburg's definitions for literary studies).

Randall McLeod believes that literature should be stable, and I agree with this to the extent that there should always be made available a base template of a text wherever possible – a “starting point” text if you will, from which to begin and to overlay changes upon. I do not, however, agree that a literary text should necessarily be static, as this implies that it is an unmoving sedentary

⁴⁸ Peter Shillingsburg, “Principles for Electronic Archives, Scholarly Editions, and Tutorials”, *The Literary Text in the Digital Age*, ed. Richard J. Finneran (Ann Arbor: University of Michigan Press, 1996), 30-35.

object, unable to be adapted or flexible and not of interest to modern or new readers.

The most popular way of ensuring that literature remains far from static, is to transform it into electronic form. Existing as electronic text as opposed to text on a physical page, both forms retain the ability to encompass aspects such as footnotes and general notes, and the two forms of medium appear quite similar. However, the introduction of hypertext is where the similarities end; there are few comparable features in the world of the paper-based publication, other than perhaps page references and footnotes, as they direct the reader to other pages much as a hyperlink would in a hypertext document.

To introduce hypertext into editing (or vice versa) is to deconstruct the physical form of the book; to scatter the pages far and wide, and still be able to access every last one at the click of a button. On the one hand, it breaks up the text as a singular form, but on the other hand, it interweaves and cross-references the material within itself more than a paper-based book would be capable. This not only offers new ways of reading, but also new ways of editing early modern texts.

This movement from the page to the screen means that literature may never be wholly stable again. The majority of servers on the Internet that support and host new electronic editions produced in hypertext will all have been “down” at one time or another. During this downtime the material cannot be

accessed or remotely edited, unless of course a mirror site provides a current backup of the data.

Another concern with storing electronic copies of texts might be in retaining electronic backups of the versions of texts that have been edited. As is often the case with software, one version supersedes another and the previous version is no longer available to view or compare or be supported. This is obviously different from life in the tangible world as when new or revised editions are published, their older versions physically remain to be viewed and referred to.

If, for example, the second edition of a play is published, the first edition will likely still be on bookshelves, and can still be physically accessed. When electronic editions are published on the Internet, any versions that are not current are often completely removed from the public domain and even deleted without record, particularly if they are reliant on a form of technology which is no longer available or supported.

Kastan⁴⁹ has some interesting observations about hypertext and the electronic edition, which are extremely relevant issues to the Active Reading edition. He believes that a hypertext edition of Shakespeare's plays would enable the majority of original information to be included, such as early substantive printings in the text, as well as the possibility of including a variety of critically edited texts. This is the principal aim behind the generation of my

⁴⁹ Kastan, *Shakespeare After Theory*, 36.

work; that all available editions of the play *King Lear* be available in a hypertext document for viewing online – a virtually impossible task were it to be considered with paper as the medium.

“The hypertext is less an edition than an archive, and it is one thing to have such (hyper)textual richness available and quite another to read it.”⁵⁰ Kastan’s view is probably the main argument against the creation of the new electronic edition, as there will seemingly always be the issue of the feasibility of reading vast amounts of text from the screen. I must disagree to a certain extent with Kastan’s opinion that we as a literary community will continue as we have done previously, to read, teach, and edit on paper and using books alone, rather than also using the medium of the computer. There will always be the issue of reading from the screen, but there is no reason why sensitively and intelligently produced electronic editions cannot be used or referred to for teaching purposes, learning purposes, and/ or research purposes on a daily basis.

Computers are utilised by students in schools on a daily basis as part of their academic programmes. Most young people have grown up with computers and are familiar with using them, both in and outside of school for work and leisure. Incorporating technology into a taught subject such as English Literature has almost become seamless, as the majority of undergraduate students who took part in the prototype trials for this project had been using a computer for a number of years, and the Research Methods unit for Research

⁵⁰ Ibid.

Students incorporate use of electronic journals in the library. Children have been found to be very responsive when their school subject is presented in conjunction with some kind of new technology, and many “children are exposed to computers from a very early age.”⁵¹ Even as a general reference tool for adults, an online scholarly edition could be relevant. An electronic edition would also be much more accessible than many books, as it is virtually independent of specific location (no carrying heavy books around), and could be accessed from any computer terminal with an Internet connection and browser or software reader.

A problem for contemporary editors dealing with early modern textual material is that it does not often use the common modern English language that is in use today. Shakespeare’s English was “non-standard English, both structurally and contextually very different from its modern counterpart.”⁵² This therefore means that editors producing electronic scholarly editions cannot simply present the text alone on the screen as with many modern plays, but must include a lengthy apparatus or glossary, or links to them, in order for the text to be comprehensible to a modern reader. This can contribute an additional problem, making the screen cluttered and difficult to read visually. A sensitive editor would then be required to create a comprehensible edition that is both simple to use and view, minimizing the amount of text on the main part of the screen at any one time.

⁵¹ Kori M. Inkpen, “Drag-and-drop versus point-and-click mouse interaction styles for children”, *ACM Transactions on Computer-Human Interaction (TOCHI)* (2001), v.8 n.1, 1-33.

⁵² Holderness, *Cultural Shakespeare*, 110.

This also leads to issues of reading and editing large amounts of text on the screen. The immediate response of most people when confronted with a large amount of onscreen text to read is to print it out. If the readers of an electronic edition of a lengthy text were given the ability to alter certain aspects of the onscreen material such as font size, style, or colour, this might help to alleviate somewhat the problem of “information overload” or at the very least make the text more readable and digestible onscreen. If users/ readers could, for example, enlarge the size of the font to a suitable size of their own preference, this would perhaps make reading from the screen more pleasurable, and would perhaps contribute to making the text more personal to individual users/ readers. Using a browser such as Microsoft Internet Explorer (IE) or Mozilla Firefox, it is possible for a user to increase or decrease font sizes on a webpage, providing that page does not restrict this feature.

The option of printing out some of the text could always remain as an option, but this should be avoided if at possible as it is defeating the purpose of electronic text. By printing out, the reader is not really accepting the electronic medium of the edition, but rather trying to retain a grasp, on the original format of the text; the paper. It is the linear nature of texts that makes them so suitable for the medium of print, but it is also this medium which creates restrictions on any further interactions with texts. For example, physically turning the pages and navigating around a text from appendices to footnotes or from references to a specific quote, could be made much more simple

tasks should they be undertaken incorporating a technology such as hypertext, where links between pieces of text can be made instantly.

Although primarily intended for visual or aural performance, the poetic nature of some of Shakespeare's texts perhaps reflected his intention for his plays to be referenced again, and perhaps quoted – thus almost implying that the reader's experience might be an interactive one; flicking back and forth through the pages to find a favourite character quote or scene.

Complex texts of the early modern period in some ways anticipated recent developments and concerns in electronic media, reflecting their producers' sense that non-serial access could both make the texts more usable and could shape the ways in which they are used.⁵³

2.4.1 An Active Reading Edition

The Active Reading has involved producing part of an electronic scholarly edition, aiming to have the capacity to display all the available textual versions of "They Flee From Me" or *King Lear* onscreen at the same time. This might at first sound like an ambitious and perhaps puzzling concept, and in attempting to compare the paper-based texts of the various versions of *King Lear* available in print, there is an immediate issue of disorientation. Attempting to examine four or five different paper-based texts of the same work at the same time can be extremely confusing and can leave a reader

⁵³ Thomas N. Corns, "The Early Modern Search Engine: Indices, Title Pages, Marginalia and Contents" in *The Renaissance Computer: Knowledge Technology in the First Age of Print*, ed. Neil Rhodes and Jonathan Sawday (New York and London: Routledge, 2000), 103.

under a mountain of textual material which is difficult to compare and keep place within.

The advantage of combining a number of texts on one screen digitally is that hypertext can allow links to connect the versions together without the need for individual copies to be displayed in their entirety. For example, by clicking on one word in one version of the text, a series of alternative words from other versions could appear, and the user/ reader can then compare version variants without having to navigate away from their starting page. This also offers an additional advantage in that the reader can essentially take on the role of editor; they can choose the variant of a word which they feel is best suited to that version of the play, and alter it for their own reading purposes. However, incorporating this facility does leave itself open to criticism by writers who feel that nowadays anyone can call themselves an editor by owning a personal website.

My opinion is that as the practice-based element of this thesis concerns scholarly electronic editions, their principal function will be to facilitate learning, enable research and study, and hopefully understanding. As mentioned earlier in this thesis, I feel that it is acceptable for general readers to become editors if the purpose of this activity is to aid their understanding of texts.

2.4.2 Some definitions for Electronic Editing

In a field such as electronic editing, it can be difficult to establish exactly what we mean by “the editor” of a document or text. This problem is multi-faceted in that we must establish the identity of the editor for the purposes of reading the text, i.e. can the author be considered a contributing editor, or must this be a separate individual or individuals. By addressing this issue, we might also be encouraged to examine the role and identity of the author of a text, and what exactly defines an author or original author of a work. Also, with reference to the electronic or technological definition of editing, an “editor” can also be a reference to the hypertext generation program through which the text was created, as can the term “authoring”, as in “authoring software”.

2.4.3 The Editor

In literary terms, the definition of the editor of a document is one who edits; especially a person who prepares, revises, and corrects a book, or other item of written material for publication.⁵⁴ In computing terms, as I have mentioned, the definition of the word editor has a somewhat different meaning in that it does not describe a human as an editor, but rather a computer program which can be used to process a piece of electronic text (see Appendix 1.2).

In recent times, the term “editor”, in the electronic sense, has increasingly been used to describe just about anyone who has attempted to experiment with HTML (Hypertext Markup Language). Kastan’s opinion of modern

⁵⁴ Dictionary.com definition of the term “Editor”, <http://www.dictionary.com/search?q=editor> (accessed June 15, 2008).

editing⁵⁵ sounds more valid again, as amateur creators of websites find that their only qualification for being able to be termed electronic editors, is that; 1) they have attempted to teach themselves HTML or to use a hypertext editing tool such as Microsoft FrontPage, or; 2) there is virtually no external regulation for the creation of personal webpages published on the Internet. These “editors” can therefore edit and create just about whatever they want with no necessary regard to the basics of good website design, or good editing practice in general.

2.4.4 The Author

The “author” of a text or document, in terms of literary works, is usually perceived to be the original creator of the document, i.e. the person or persons who have creative copyright over the work. However, the term can also have several other meanings, particularly when applied to other fields. As I mentioned previously, in the domain of computing the term “author” can be applied to a piece of software through which a piece of work can be generated, for example, “authoring software” such as Macromedia Director.

The concept of the author in literary terms can be difficult, for example if someone else produces another “version” of *King Lear*, can they then be considered a contributing author of that work, or are they merely an author of that particular version, or not an author at all? Also, if an editor were to make considerable changes to an original text, are they then considered to be an author of that work? An interesting question would be how much of a

⁵⁵ Kastan, *Shakespeare After Theory*, 30.

contribution a writer or an editor has to make to a work to be considered an “author” of that text?

3 The Notion of Active Reading

It has been interesting to observe the various dictionary definitions of the term “read”. The Oxford English Dictionary defines the word “read” as to: “look at and understand the meaning of (written or printed matter) by interpreting its characters or symbols”,⁵⁶ the online resource Dictionary.com similarly defines “read” by making reference to understanding and meaning⁵⁷. Both these definitions describe the base process of reading, but do not go into any detail about how the practice of reading draws meaning from text or how, in a creative sense, words can produce a different meaning depending on the context in which they are found.

The practice of reading involves not only the basic cognitive process of reading, but also understanding, recall, questioning and creativity. The reader is a contributor to the success of works which they themselves have not authored nor edited. The term Active Reading is being used more frequently in education and across the Web as a learning and revision strategy – a way of reading and remembering the content of a long or complex text.

3.1 The Reader and the Reading Process

When attempting to read a Renaissance text or any literary text, it is important to understand that the reading process is not just about what the author wishes to convey. It is also about how the material is processed in the mind of the reader, and then interpreted and related to the rest of the text. In the case

⁵⁶ The Oxford English Dictionary online, “Definition of ‘Read’”, http://www.askoxford.com/concise_oed/orexxad?view=uk (accessed June 15, 2008).

⁵⁷ Dictionary.com, “Definition of ‘Read’”, <http://dictionary.reference.com/browse/read> (accessed June 15, 2008).

of a Shakespearean text, there is no surviving author to consult about the meaning of the text; this can only be surmised by comparing other works purported to be by the author, and examining historically relevant evidence.

The reading process has been examined many times, involving reading, understanding, recall, questioning and creativity. "...the literary work has two poles, which we might call the artistic and the aesthetic: the artistic pole is the author's text, and the aesthetic is the realisation accomplished by the reader."⁵⁸ The Active Reading process implies that "...the reader writes the text..."⁵⁹ Of course this is not in itself a true statement, but within the mind of a reader, the text is being processed, and in effect written again.

Hence, the literary scholar's task is one of developing a creative understanding of a work employing the various editions, with a view to producing an individually insightful and novel account of the work's meaning.⁶⁰

It is only by actively engaging with the text in the manner that an editor might, that readers can begin to extract meaning for themselves - reading and making editorial decisions about the value and effect of certain variants across two or more editions.

⁵⁸ Wolfgang Iser, "Interaction between Text and Reader" in *The Reader In The Text: Essays on Audience and Interpretation*, ed. Susan R. Suleiman and Inge Crosman (Princeton & Oxford: Princeton University Press, 1980), 106.

⁵⁹ Jacques Derrida, quoted in Robert Crosman, "Do Readers Make Meaning?" *The Reader In The Text*, 149.

⁶⁰ Chris Roast, et al., "Re-creating the Reader", 110.

“A poem, in fact, can only be re-read, not read, since some of its structures can only be perceived retrospectively.”⁶¹ This has an impact on the ways that text is read and understood, and is specific to the creation of the prototype of the poem “They Flee From Me”.

3.2 Creativity

Literary creativity is more often than not associated with writing than with reading, therefore editing can be construed as being a highly creative activity as it encompasses both reading and writing (or rather, re-writing). In his book *How We Write: Writing as Creative Design*⁶², Mike Sharples discusses the creative process of writing, in particular the activities of engagement and reflection. “The writer in the act has two options: to be carried along by the flow of words, perhaps in some unplanned direction, or to alternate between reflection and writing”.⁶³ If one were to substitute the word “writer” for the word “reader” in this context, it is possible to see the basic cognitive structure for engagement with a text. Sharples also provides a visual representation of the cycle of engagement and reflection in writing, which can be seen in Fig. 1 below.

⁶¹ Terry Eagleton, *Literary Theory: An Introduction*. (Oxford: Blackwell, 1996 2nd Ed.), 89.

⁶² Mike Sharples, *How We Write: Writing As Creative Design*. (London: Routledge, 1999).

⁶³ *Ibid.*, 7.

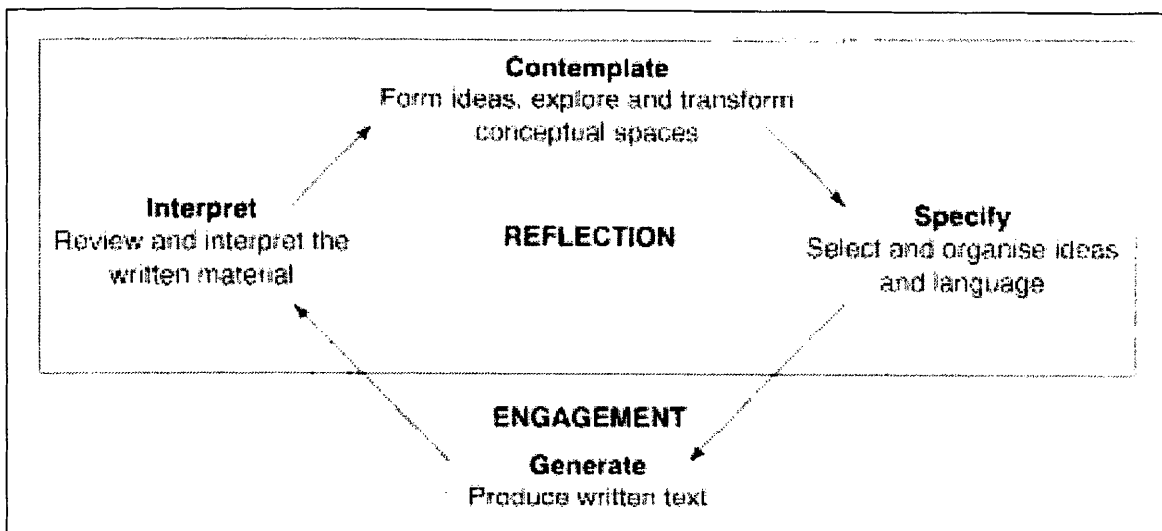


Fig. 1 The cycle of engagement and reflection in writing⁶⁴

It is possible to see how interactivity or engagement with texts can have a direct effect on how they are perceived. This theory could similarly be applied to the process of Active Reading.

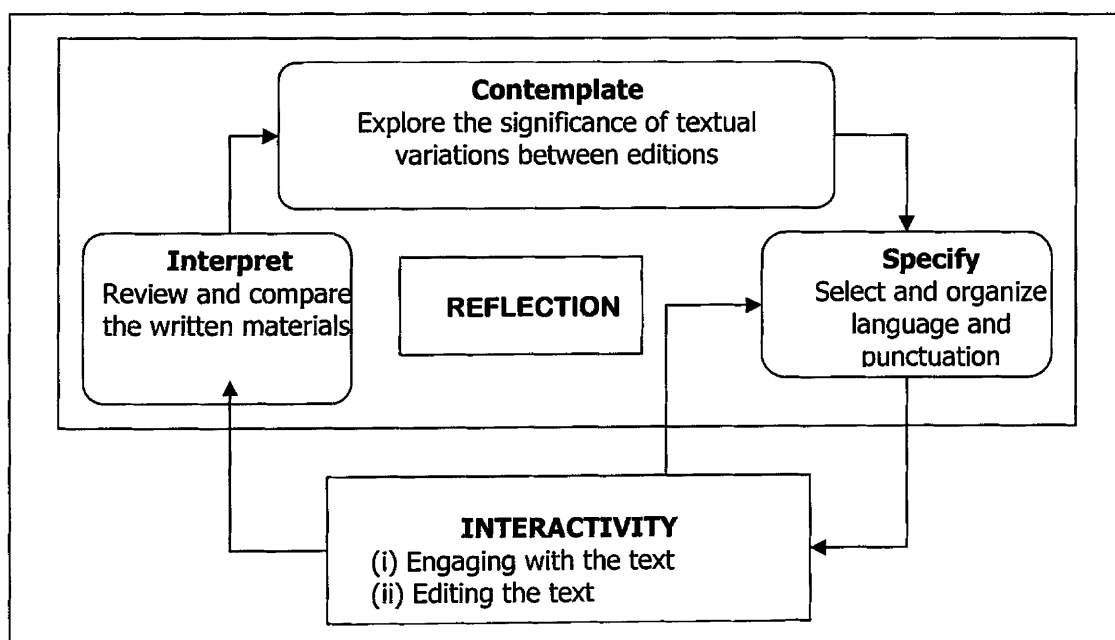


Fig. 2 An adapted cycle of engagement and reflection in Active Reading

⁶⁴ Ibid.

In addition to reading as a basis for creative understanding, the concept of active reading values the impact of articulation and reflection on this process. By assuming an active role, readers can control their own edition, and active reading becomes a constrained form of creative composition with many of the characteristics of writing.⁶⁵

In Fig. 2, I have adapted Sharples' model to replicate the process of active reading, incorporating the practice of editing. The reader interacts with the text, interprets their findings in comparing different editions, contemplates the significance of variants between these editions, and then specifies the editorial choices they will make.

3.3 Making Meaning

One of the most important tasks the reader must carry out is to determine hidden meanings and make explicit what was left implicit in the text. In order to do this, the reader must draw on the context provided by the text that has been read so far, by the external situation that the reader is in, and by the overarching task that the reader is carrying out.⁶⁶

Meaning is a difficult concept to discuss – for a reader; extracting meaning is a process which can be affected by many influences both internal and external. A reader can find meaning in a text which was never intended by its author, or can misinterpret the meaning of a passage if unaware of certain historical or political facts relating to the text. Words or references in common usage in the 16th or 17th century can have a very different meaning or

⁶⁵ Chris Roast, et al., "Re-creating the Reader", 110.

⁶⁶ Ashwin Ram and Kenneth Moorman, *Understanding Language Understanding: Computational Models of Reading* (Cambridge, MA: MIT Press, 1999).

implication to those used now. New Historicism for example, provides a filter through which texts can be viewed in the historical context in which they first appeared and were performed. This historical backdrop can have significant implications for meaning and interpretation of a text.

By focusing on those 'cultural meanings' that we generate now, in our own historical context – meanings which can hardly be separated from our perception of those generated then, in the text's historical context.⁶⁷

Additionally, if the text has become the victim of a censorious editor, as in the expurgated editing of Shakespeare by Thomas Bowdler in the nineteenth century,⁶⁸ much of the intended meaning may have been omitted.

By reading we uncover the unformulated part of the text, and this very indeterminacy is the force that drives us to work out a configurative meaning while at the same time giving us the necessary degree of freedom to do so.⁶⁹

It is interesting to consider physical similarities between the realms of literature and computing, in terms of how the positioning of textual elements within a work can have an effect on meaning and on the rest of the text. The positioning of a piece of code for example, can have an effect somewhere else in the program, similarly the appearance of a specific character in a play for example, can alter the meaning of a scene.

⁶⁷ Terence Hawkes, *Meaning By Shakespeare* (Routledge: London, 1992), 133.

⁶⁸ William Shakespeare, *The Family Shakespeare*, ed. Thomas Bowdler (London: Richard Cruttwell for J. Hatchard, 1807).

⁶⁹ Wolfgang Iser, *The Implied Reader* (Baltimore: Johns Hopkins Univ. Press, 1974), 287.

4 A Review of Relevant Literature

There are many scholarly groups that have defined guidelines for the production of electronic scholarly editions, but still relatively few actual applications or editions available for viewing on the Internet. The TEI project (Text Encoding Initiative) is concerned directly with the methodology of encoding, and has defined a number of different ways of encoding specific textual materials.⁷⁰ Although the ideas of research groups working in this area are important to consider, it is important that a new edition contains its own set of guidelines with regard to encoding the text. The TEI guidelines for electronic text encoding⁷¹ for example, make specific reference to the use of XML in this process, and would provide a useful starting point for exploration.

There are several other groups working within similar fields. These include: Brown University's "Scholarly Technology Group", The University of Bergen's "Humanities Information Technologies Research Programme", The University of Victoria's "Humanities Computing and Media Centre", The University of Virginia's "Electronic Text Centre" and "The Institute for Advanced Technology in the Humanities", and The University of Maryland's "Maryland Institute for Technology in the Humanities".

The Schoenberg Centre for Electronic Text and Image at the University of Pennsylvania Library has a much more multimedia approach to the provision

⁷⁰ TEI Consortium, eds., "4 Default Text Structure." *TEI P5: Guidelines for Electronic Text Encoding and Interchange*. [Version 1.1.0]. [Last modified July 4, 2008]. TEI Consortium. <http://www.tei-c.org/release/doc/tei-p5-doc/en/html/DS.html#DSDIV> (accessed June 15, 2008).

⁷¹ TEI Consortium, eds., *TEI P4 Guidelines for Electronic Text Encoding and Interchange. XML-compatible edition*, <http://www.tei-c.org/release/doc/tei-p4-doc/html> (accessed June 15, 2008).

of electronic texts and editions⁷², but which does not involve the process of encoding. Their project is concerned primarily with multimedia visuals, and the majority of material is presented as Macromedia Flash movies on their website. This approach would perhaps be more suited to the teaching of younger students than the target user group of the Active Reading project, as it appears to focus more on keeping the attention of the user by providing them with information about the text, rather than allowing them to dissect the text themselves.

It is also important that a new electronic edition has individualism and an originality of its own with which to present the material; a new electronic edition is a “new” presentation of the material. The principal way to identify a newly created edition is to recognise that it has an editor who is an individual (or a series of editors). By doing this, it is clear that this editor (or editors) will have left their mark on the text, and will have reproduced the original text or texts in their own style – perhaps modernising spelling or punctuation, or altering the layout of the text on the page or screen. It is therefore important to determine what the role of an editor is, and how much of a responsibility they hold with regard to adhering to the author (or authors) original intentions for the text.

There appears to be an abundance of groups intending to create electronic editions of literary texts online, by encoding the material using a markup language such as HTML, or by creating a multimedia presentation of the

⁷² The Horace Howard Furness Shakespeare Library at the Schoenberg Centre for Electronic Text and Image (SCETI), <http://dewey.library.upenn.edu/sceti/furness>, (accessed June 15, 2008).

written text, using images and animation. These methods all have a purpose in their own right, but are not the principal concern of this project.

A key technology that has been used in the development of the project is XML. XML allows for information not only to be stored and shared, but to be described – thus making it a useful tool for the encoding of literary texts. When combined with XSL (Extensible Stylesheet Language) technology, XML can be transformed to display the data it contains in any number of ways. Although existing editions of Shakespeare plays that have been produced using XML are available online, none of these appear to encompass all the aims of this project. There are several versions encoded separately, but none of these have the ability to display all versions of a text simultaneously, and not with all variants encoded.

Other aspects to consider are in the fields of user interface design and design for interaction. One important aspect to realise when developing an online application is that the majority of target users of the final application, and also during trial periods, will probably have had previous experience of reading and accessing websites in the academic domain. They may be familiar with a certain style of interface and navigation system for example, and therefore expecting similar elements when encountering a new e-edition. A useful quotation supporting these ideas is from Christine Faulkner's book: "The interface should reinforce the user's expectations from any previous interaction with that system or indeed with similar systems"⁷³

⁷³ Christine Faulkner, *The Essence of Human-Computer Interaction*. (London: Prentice-Hall, 1998), 56.

It is important to have a design rationale for creating an interface, as there are many elements of user interface design to consider in this project. Examples of these include: the use of colour, the positioning of onscreen elements, use of metaphors, and chunking of onscreen information into meaningful groups in order to aid cognitive processes such as memory and recall. The use of colour in applications has been described as a “useful coding mechanism for grouping,⁷⁴” and is a useful area to research with regard to the task of identifying different versions of a text.

Usability is a key concept to grasp when developing a new application, as is “learnability.” The definition of learnability is how easy it is to learn a system, and, “a user interface must encourage a relaxed attitude since users are more likely to succeed with the system if they are not under stress”⁷⁵. This statement rings true, especially in a classroom situation, where a student may be encountering very new and complex textual material perhaps for the first time. The design of the application must therefore reflect this as well as the other needs of the target user groups.

The experience gained from the research and development of prototype new editions has benefited and enabled collaborations between the Humanities and Computing communities within the University, and the development of further electronic editions of Renaissance texts will contribute to a larger community for the development of future electronic editions.

⁷⁴ Jenny Preece, et al., *Human-Computer Interaction*. (Essex: Addison-Wesley, 1994), 92.

⁷⁵ Faulkner, *The Essence of Human-Computer Interaction*, 44.

Researchers have begun to investigate the issues associated with the existence of multiple published editions of early modern texts. In *The Division of the Kingdoms*, the issue of the existence of two completely separate versions of one text (Shakespeare's *King Lear*) becomes a subject of intense discussion. The concept that two editions of one play could have variants so different from each other that they could in fact be considered two separate works; *The History of King Lear*, and *The Tragedy of King Lear*, has become a very important area of debate in the literary community. The publication of the Arden third edition of *Hamlet*, containing three separate texts of the play is not without its critics, as has been mentioned earlier in this thesis.

A Section entitled "Text, Textuality and Technology" appeared in *The Shakespearean International Yearbook*⁷⁶ for the year 2002, which included Ian Lancashire's article "The State of Computing in Shakespeare". Lancashire provides an overview of many of the tools to enhance the study of Shakespearean texts from the 1980s to the present, such as CD-ROMs, online dictionaries, and electronic editions, and views the tools themselves as "presenting enough of a challenge for Shakespearians to learn and use."⁷⁷

In addition to these offline resources, Lancashire comments on the wealth of online resources available, including mailing lists such as SHAKSPER, search engines, online databases, and electronic journals, such as *Early Modern Literary Studies* (EMLS). The problems of computer-assisted

⁷⁶ Elton and Mucciolo, eds., *The Shakespeare International Yearbook*, 89-179.

⁷⁷ Ian Lancashire, "The State of Computing in Shakespeare", in *The Shakespeare International Yearbook*, 89.

stylometric research versus non-computing Shakespeareans are discussed. The emphasis is upon human thought and decision-making as opposed to the use of computer algorithms and programs that do not take into account repetitive features of a text (such as textual elements which do not follow a pattern that can be identified by a machine i.e. they would require the knowledge of a human to draw comparisons). Various models of encoding for electronic editions are described, in particular the Oxford Electronic Shakespeare, and Michael Best's *Internet Shakespeare Editions* (ISE), where the HTML encoding preserves italics and the majority of old spelling.⁷⁸

Another entry in the 2002 *Shakespearean International Yearbook* is Richard Proudfoot's article "New Conservatism and the Theatrical Text: Editing Shakespeare for the Third Millennium." In it, Proudfoot talks of the changing task of editing Shakespeare in the twentieth century. He expresses the view that "it is fashionable to distrust editorial alteration in the editing of texts, and it is probably true that many experienced editors have more often regretted an emendation which fuller understanding revealed as unnecessary than an overcautious decision not to emend."⁷⁹

However, Proudfoot does not simply criticise but also offers an outline for a possible future form of edition with texts in parallel where: 1) the editor could feel less inhibited in modernising thoroughly because the reader would have immediate access to the original textual authority; 2) the need to collate would be greatly reduced; 3) detailed comment on particular technical details of the

⁷⁸ Ibid., 103.

⁷⁹ Richard Proudfoot, "New Conservatism and the Theatrical Text" in *The Shakespeare International Yearbook*, 134.

printing would be made possible, and 4) the real differences between the physical forms of the early editions in which the plays have survived would be revealed and made visible for all to see.⁸⁰

In his book *Designing Usable Electronic Text* Andrew Dillon⁸¹ looks in detail at the issues concerning both reading from screens and from paper. In the chapter entitled: "So what do we know? An overview of the empirical literature on reading from screens"⁸², he divides results from various sources into those looking specifically at speed, at accuracy, fatigue (for the user, when spending long periods of time on a task), comprehension, and preference (for example, if the user expresses a general preference for reading from paper-based texts). All the findings Dillon presents are the result of experiments with novice users, and they generally vary in their evidence. In the majority of trials, it remains unclear whether the choice of paper over a screen is more beneficial for the reading of certain written materials, except where some sort of search facility is appropriate; revealing the computer (and screen) as the more appropriate tool.

The main theme of the book focuses on the need for usable electronic texts which although not designed to *replace* the paper-based text, are better able to bridge the gap between the mediums. *Designing Usable Electronic Text* looks at how readers read, use and view texts, with a focus on reading from screens that is relevant to this thesis. Dillon discusses the relative merits of

⁸⁰ Ibid., 140-141.

⁸¹ Andrew Dillon, *Designing Usable Electronic Text: Ergonomic Aspects of Human Information Usage* (London: Taylor & Francis, 1994).

⁸² Ibid., 28-58.

reading from both paper-based material and electronic texts, presenting the two schools of thought on the topic of electronic texts. "The first (school of thought) holds that paper is far superior and will never be replaced by screens... The second school favours the use of electronic text, citing ease of storage and retrieval, flexibility of structure and saving of natural resources as major incentives."⁸³ A breakdown of the main topics of relevance covered by this book is presented below.

"The Reading Process and Electronic Text", is for the most part concerned with outlining the scope of the book and what the aims of the research are. Dillon does briefly discuss the emergence of electronic text, but as an introductory history, rather than making any real points about it at this early stage. He suggests that "...one should avoid seeing electronic text as a competitor to paper in some form of 'either-or' challenge for supremacy."⁸⁴ This supports an important point to be stressed by my thesis; that my application does not strive to eliminate the process of reading from paper, but aims to enhance it by contributing interactive elements. The electronic edition should not be in competition with the paper edition, it should be allowed to be another medium to choose from, in order to provide a diverse learning environment for students.

The chapter also mentions the psychology of reading, an area which I have much interest in. This is also mentioned in more detail further on, and as the author is an applied psychologist by training so has much to say on the

⁸³ Ibid., 28.

⁸⁴ Ibid., 3.

matter. Dillon makes clear for the reader the distinction between what is electronic text and what is not – for example, some might consider microfiche to be electronic texts, but Dillon makes clear that he does not consider these as such as they “involve magnification and projection rather than electronic processing”.⁸⁵ The author puts forward a brief discussion of the methods employed in the book, such as experimental or exploratory, and makes reference to specific projects as illustration points.

“Electronic Documents as Usable Artefacts” introduces User-centred design processes and usability evaluation. The chapter opens with a brief introduction to technological developments in the computing field, and introduces HCI (Human-Computer Interaction) as a concept. “HCI (focuses) attention on the interface between the person and the machine such that interface design has now become a central concern to interactive product developers.”⁸⁶ Further in, aspects such as functionality are discussed.

“Functionality refers to the complete range of facilities offered by a tool or product.”⁸⁷ Evaluation tools such as task analysis are discussed, which I hope to use in evaluating my final application. “Task analysis may be defined as the process of identifying and describing units of work and analysing the human and equipment/ environmental resources necessary for successful work performance.”⁸⁸

⁸⁵ Ibid., 5.

⁸⁶ Ibid., 12.

⁸⁷ Ibid., 13.

⁸⁸ Ibid., 21.

“So What Do We Know? An Overview of the Empirical Literature on Reading from Screens” discusses the two schools of thought on electronic texts – one, suggesting that “paper is far superior and will never be replaced by screens”⁸⁹, and the second, which supports the use of the electronic text “citing ease of storage and retrieval, flexibility of structure and saving of natural resources as a major incentive.”⁹⁰

Dillon looks at some of the experiments which have been undertaken to examine the differences between reading from paper and from electronic text. He looks at the outcome measures of these experiments, in terms of: speed of reading, accuracy, fatigue experienced by the reader, and comprehension. He also looks at measures taken to record these outcomes, such as: tracing eye movements, manipulation, and navigation – which I have used in the observational studies of my prototype application.

Dillon also looks at issues such as display size (the size of the screen area which is made available for text, and various visual aspects which may degrade the performance of a reader, because of unclear images or text. In “Describing the Reading Process at an Appropriate Level”, Dillon criticises the empirical literature on reading in this chapter, and goes on to talk about specific projects. I did not find this chapter as relevant to my work, and so have not reviewed it here.

⁸⁹ Ibid., 28.

⁹⁰ Ibid.

“Classifying Information into Types: the Context of Use” looks at readers and how they cope with reading various forms of written text, for example, a newspaper, or a novel, or a catalogue, or conference proceedings. It also looks at the goals of readers, and what they hope to achieve by reading – whether it is work or personal reading material. For example, looking at “why they are read – for professional or personal reasons, to learn or not, out of interest or out of need, etc”⁹¹ I found this chapter most useful when looking at the length of texts to be read, for example difficulties of reading lengthy amounts of text from the screen due to fatigue.

“Capturing Process Data on Reading” examines the cognitive processes at work, and how people read. For example, how readers skim through features such as a contents table, or a printed list. “When an article of interest is identified then the reader opens the journal at the start of the relevant paper. The abstract is usually attended to and a decision made about the suitability of the article for the reader’s purposes.”⁹²

“Information as a Structured Space” discusses the structure of information, for example “all traditional text, whether in printed form or computer files, is sequential, meaning there is a single linear sequence defining the order in which it is to be read.... Hypertext is non-sequential; there is no single order in which the text is to be read.”⁹³ This is I think an important point to consider when developing an electronic text of something like a Shakespearean play,

⁹¹ Ibid., 83.

⁹² Ibid., 97.

⁹³ Ibid., 105.

as onscreen, the structure is very different from turning the pages of a printed play.

“A Framework for the Design of Electronic Texts” offers a design model for the development of electronic texts. The framework put forward “...is intended to cover reading as it pertains both to proof-reading and scanning of lengthy texts...”⁹⁴ The chapter looks at several different models, including the Task Model. “The notion of the reading task as the crucial factor in understanding text use provides a sound bias from which electronic text design can be investigated.”⁹⁵ By presenting a number of models from which to develop a framework for design, the author has enabled me to select the features most relevant to my work, and produce my own framework for development.

“Designing Usable Electronic Text: Conclusions and Prospects” looks back at Dillion’s book as a whole, referencing some of the experiments approached earlier in the book. In “Further Research” Dillon suggests, “not enough is known about the characteristic manner of reading involved for particular texts or text/task combinations.”⁹⁶ I think this is particularly important point, as when approaching the study of English Literature for example, texts can be in any number of formats, for example, plays, poetry, novels, lyrics, short stories and so on. This led me to consider that the way a reader reads a play for example, is very different to reading a poem. Different elements in the text are encountered, and therefore different cognitive processes are at work. If a text

⁹⁴ Ibid., 133.

⁹⁵ Ibid., 124.

⁹⁶ Ibid., 170.

is in another language, or rural dialect for example, the brain would take longer to decipher the material than if the text were in their native language.

Dillon also included a section on “Specifying the Design Process for Hypertexts”, which offered a series of stages for the design of a usable hypertext database. I have selected some of these stages to apply to the development of my application:

- Task analysis of the text(s) involved according to three (at least but not exclusive) criteria – *how* it is used, *why* it is used and *what* readers perceive the information to be;
- Investigations of the extent to which the document structure is fixed by existing readers' models;
- Determining the electronic structure by considering the readers' existing models, potential models and the tasks being performed;
- Considering the manipulation facilities required for basic use and ensuring that readers can at least perform these activities simply with the mechanisms provided;
- Attempting to add value to the system by offering facilities to perform desirable or advantageous activities that are impossible, difficult or time-consuming with paper;
- Ensuring image quality is high (and text quality and size!);
- Testing the system on users performing real tasks and redesigning accordingly.⁹⁷

⁹⁷ Ibid., 171-172.

My Conclusions

Virtually every chapter opens with an introduction to the main topics that will be contained within. I found this a useful way to be eased into a chapter, and approach some of the concepts with a little more knowledge. At the back of the book in the Appendix is an “Example Protocol for Reader in Validity Experiment (Word Processor User)”⁹⁸ – and although looking rather like something from linguistics than technology, gave me some ideas for evaluation of my own project work, and potentially using the protocol for experimentation into Active Reading. Virtually every chapter also ends with a concluding section, or suggestions for the way forward. I found this to be a very helpful method of organising the information, and a beneficial structure for grasping the concepts.

Overall I found the *Designing Usable Electronic Text* to be extremely useful in helping to formulate my ideas about developing a digital edition, and offered points of reference for developing my own research and practical work. Dillon has covered an area that (much like my project) is interdisciplinary and crosses the borders of computing, textual studies, psychology, and Human-Computer Interaction (HCI).

⁹⁸ Ibid., 187-192.

5 A Review of Methods of viewing Multiple Texts

To examine several paper-based editions of a work for textual variants is to undertake a time-consuming and somewhat confusing task – faced with reams of paper, and having to keep place within that material in order to make comparisons. A modern solution to this task would be to gather the various editions together, and produce one electronic edition which could make use of hyperlinks in the texts to make these comparisons between editions considerably simpler. The challenge is to develop an interface which can effectively support the activity of reading and comparing textual variants, without cluttering the screen and confusing the reader.

5.1 Paper-based Editions

There are several examples of print copies of multiple texts. *King Lear: A Parallel Text Edition* edited by René Weis⁹⁹, which sets out the Q and F texts side by side for comparison, and Bernice Kliman's *The Three-Text Hamlet: Parallel Texts of the First and Second Quartos and First Folio*¹⁰⁰ (which also exists in electronic form as *The Enfolded Hamlet*).

Another example, as mentioned in Chapter 2 of this thesis, is within *The Norton Shakespeare* complete works, which presents *King Lear* as three separate versions; The History, The Tragedy (which are printed side by side), and a conflated version “so that readers can encounter the tragedy in the

⁹⁹ William Shakespeare, *King Lear: A Parallel Text Edition*, ed. René Weis (London: Longman, 1993).

¹⁰⁰ Bernice W. Kliman, *The Three-Text Hamlet: Parallel Texts of the First and Second Quartos and First Folio* (New York: AMS Press, 2003).

form that it assumed in most editions from the eighteenth century until very recently.”¹⁰¹

In addition to edited multiple-text editions, there are publications which include no editing of the texts themselves, but instead present images of the facsimiles accompanied by bibliographical information and commentaries on the scholarship of the texts, such as *The Complete King Lear, 1608-1623: Texts and Parallel Texts in Photographic Facsimile*¹⁰², edited by Michael Warren. However, in this case, even photographic facsimiles have been edited to a degree, as “the margins provide Folio through line-numbering and identify press variants with asterisks; act, scene, and line references from *The Riverside Shakespeare* are given at the foot of each page”¹⁰³.

5.2 Mechanically: the use of Collators

Another interesting method of comparing multiple texts is through the use of “collators”. It has been established that textual variants between two or more editions of a text have been attributed to many different factors. In *The Printing and Proof-Reading of the First Folio of Shakespeare, Volume 1*, Charlton Hinman¹⁰⁴ presents clear examples of the potential origins of many of these variants, enabling a better understanding of issues faced by editors when producing a new edition of Shakespeare’s works. In order to examine

¹⁰¹ Greenblatt, *The Norton Shakespeare*, 2315.

¹⁰² Michael Warren, ed., *The Complete King Lear, 1608-1623: Texts and Parallel Texts In Photographic Facsimile*. (Berkeley: University of California Press, 1990).

¹⁰³ T. H. Howard-Hill, review of *The Complete King Lear, 1608-1623: Texts and Parallel Texts In Photographic Facsimile*, ed. Michael Warren, *The Review of English Studies*, Vol. 43, No. 171 (1992): 420.

¹⁰⁴ Charlton Hinman, *The Printing and Proof-Reading of the First Folio of Shakespeare, Volume 1*, (Oxford: Clarendon Press, 1963).

multiple texts more closely, Hinman developed a collator – a mechanical device allowing a reader to compare more than one copy of a text in detail.

The Hinman Collator uses electrical lights and mirrors to converge two texts into one, highlighting variations between the copies.¹⁰⁵ The Hinman Collator was most successfully used to compare the many slightly different impressions of the First Folio of Shakespeare, and inspired a number of other collators to be invented over the years, including Lindstrand Comparator, the McLeod Portable Collator, and the “Hailey's Comet”.¹⁰⁶ However, standing at just under six feet tall, five feet wide, and some 450lbs¹⁰⁷, the Hinman device was not the most transportable of machines.

The McLeod Portable Collator developed by Randall McLeod is a portable stereoscopic collator for simultaneous comparison of two copies of a printed page.¹⁰⁸ In some respects, this process is similar to one of the experimental digital tools produced by Dr Chris Roast of Sheffield Hallam University's School of Computing, which can be seen in Fig. 3 below.

¹⁰⁵ Kathleen Ferguson, “Inside UVA Online: Faculty Newsletter”, University of Virginia, Nov. 12-18, 1999 <http://www.virginia.edu/insideuva/1999/37/collator.html> (accessed June 15, 2008).

¹⁰⁶ Steven Escar Smith, ““Armadillos of Invention”: A Census of Mechanical Collators”, *Studies in Bibliography*, Vol. 55, (2002): 133-70.

¹⁰⁷ Steven E. Smith, SHAKSPER The Global Electronic Shakespeare Conference, <http://www.shakspere.net/archives/1999/0611.html> (accessed June 15, 2008).

¹⁰⁸ Stanford University information page for a lecture by Randall McLeod, <http://shc.stanford.edu/shc/1997-1998/events/randomcloud.html> (accessed June 15, 2008).

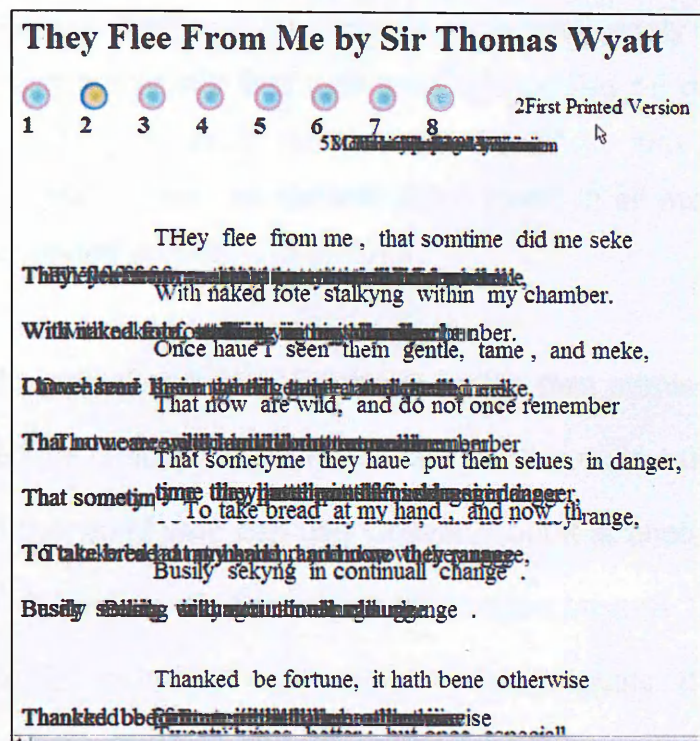


Fig. 3 “They Flee From Me”: Transparencies/Floats

The “They Flee From Me” Transparencies/Floats¹⁰⁹ prototype, which can be seen in Fig. 3, allows the user to place (with the mouse) each of the eight versions of the poem as a transparent layer on top of one another, in order to compare the variants (rather like an overhead projector transparency).

Although not a mechanical, Peter Robinson’s software program COLLATE is a computer collator. Originally written in the 1980s, it was initially designed for the grouping together via machine of a number of manuscripts of Old Norse poems.

¹⁰⁹ Chris Roast, “Transparencies/Floats” of “They Flee From Me”, 9 October 2002. This can be accessed in Appendix 3.7 on the accompanying DVD.

The collation itself was designed to cope with widely varying texts, with marginalia and with readings tagged as dubious. Each reading in each ms was compared in turn with a notional master, and all variants there found in all mss were then tabulated against one another.¹¹⁰

A complicated piece of software, Robinson by his own admission comments that COLLATE is a difficult program to use: "It is not quite true that I am the only person in the world who can use Collate... but it is uncomfortably close to the truth."¹¹¹ A number of other digital humanities projects have been born out of COLLATE, including most recently the ongoing development of CollateX¹¹² which looks to be extremely interesting with regard to some of the issues I have had in my work with multiple witnesses.

5.3 Electronically: Interactivity, Encoding and Multimedia

5.3.1 The Cambridge King Lear CD-ROM

The *Cambridge King Lear CD-ROM*¹¹³ offers an archive of textual and performance-related material relevant to the various texts of *King Lear*. One of the key purposes of the application appears to be the reintroduction of issues of ambiguity associated with the play, by demonstrating the alterations to the text made by editors and performers over the years. Many editions of

¹¹⁰ Peter M. W. Robinson, "The Collation and Textual Criticism of Icelandic Manuscripts (1): Collation", *Literary and Linguistic Computing* 4 (2) (1989): 99.

¹¹¹ Peter Robinson, "Current issues in making digital editions of medieval texts—or, do electronic scholarly editions have a future?", *Digital Medievalist* 1.1 (Spring 2005). <http://www.digitalmedievalist.org/journal/1.1/robinson> (accessed February 1, 2009).

¹¹² Peter Robinson, comment on "Alignment (CollateX)," The Anastacia and Collate Blog, comment posted February 25, 2008, <http://www.sd-editions.com/blog> (accessed February 1, 2009).

¹¹³ Christie Carson and Jacky Bratton, eds., *The Cambridge King Lear CD-ROM: Text and Performance Archive*, (Cambridge: CUP, 2000).

the text are present, including quarto, folio, and performance texts, as well as a “finder text” which offers a conflated version in order to aid navigation.

The emphasis is on performance, with some 500 illustrations from productions of the play, as well as copies of playbills, *Shakespeare Survey* reviews of performances, biographies, theatrical definitions and theatre company descriptions from *The Cambridge Guide to Theatre*. The most important aspect to grasp from the use of this CD-ROM seems to be what has been described by one of the authors as “the fluidity of the text over time”¹¹⁴

Available Texts/ the “Finder” Text

The selected texts include several of the “performance/ acting” texts, as well a central “finder” text, which serves as an anchor from which all other texts can be accessed. This finder text is a conflation of Quarto and Folio texts, and includes hyperlinks to commentaries and visual images. The full list of texts includes:

- (i) The Central Finder Text
- (ii) The Quarto Text
- (iii) The Folio Text
- (iv) *The History of King Lear* by Nahum Tate, 1681
- (v) *King Lear – A Tragedy* edited by Nicholas Rowe, 1709
- (vi) David Garrick’s Text as recorded by John Bell in 1774

¹¹⁴ Christie Carson, “Rationale Behind the Project” (The Cambridge *King Lear* CD-ROM), Royal Holloway, University of London, last update: 9 Jan 2002, <http://web.rhul.ac.uk/drama/research/lear/learrationale.html> (accessed January 05, 2005).

- (vii) William Charles Macready's Text of 1838 published by Lacy in 1857.
- (viii) Charles Kean's Text, 1858.

Accompanying materials to the texts

Introductions to the texts are provided, in addition to extensive user information and directions for using both DynaText (the software in which the application is presented) and the CD-ROM in general. In addition to this, there is a "critical material" section, which includes relevant essays on the staging of *Lear*, including such topics as performance in other countries. The Introduction by Jay Halio provides a substantial amount of information on the texts and their staging, and also incorporates significant textual analysis.

Navigation methods

There are three methods for navigating a path through the CD-ROM, these are:

- (i) The Central Finder Text
- (ii) The Table of Contents
- (iii) The Search Facility

One of the problems associated with the navigation is that so many windows are opened up during the course of using the software, even to display just a few lines of commentary. For example, to explain the variant spellings of the word "Gloucester" between the Q and F editions, a large white page window must be opened. This page does however explain the possible reasons for

differences in spelling for example due to the different composers. I should mention that these commentary notes can also be accessed directly from the main left-hand menu under “Notes on the Cambridge *King Lear* CD-ROM Finder Text”, which displays all the commentary notes in the existing window (rather than opening up additional windows).

The application also contains scanned images of the 1608 Quarto and 1623 Folio manuscripts (however, by clicking on many of these images in succession, I managed to repeatedly crash the application). These images can be zoomed-in upon to examine the text, however it does not seem possible to move between pages of the image within the same window: you must first exit the window and then click on to the picture link to access the following page.

Another problematic feature appears to be that, although the application is structured so that you can access individual Acts and Scenes, it is quite difficult to access parts of a Scene, for example sections in the middle of that Scene. As the material is contained within the DynaText software, it is stored and viewable in one long scrolling file. Users can scroll from one end of the application to the other, however, this means that they can only scroll up or down by clicking on the up and down arrows on the top and bottom of the scroll bar, which makes for quite a slow process of moving around the mass of text. Of course the search facility means that you can look for a specific word in the text, which can therefore take you to any part of the text (including the critical essay materials).

From a user perspective, another problems associated with using DynaText is the amount of knowledge required before a user can fully browse any work displayed within the software. For users already familiar with the icons and the general set up, there is little within the CD-ROM itself that requires previous knowledge in order to operate the system. When first using the application it appeared as if I had to spend quite a lot of time familiarizing myself with the software, to make sure I fully understood what all the DynaText symbols meant, as well as what some of the commentary abbreviations stood for. For example, the letters "SH" stand for "Speech Heading", but it took me some time to find my way to the somewhat buried section which could explain the meaning of this for me. The path led through the "Reference Material" section and then in to "Abbreviations and Conventions"; here I was able to translate the list of abbreviations from other parts of the application that I had been forced to make notes about.

Choice of authoring software

The decision to use DynaText for the production of the CD-ROM must surely have been due to existing availability of the software within educational institutions. However, Inso, the company that makes DynaText reportedly went out of business in 2002¹¹⁵, leaving users to find other means of support for the software. Another problematic aspect of the project has been cost. Considering the sheer amount of work that must have been put into the CD-ROM, the price seems reasonable, but in order for a significant number of

¹¹⁵ Peter Finch (Home Planet Software), "DynaText and DynaWeb" [last update: 28 September 2002], http://www.homepia.net/xml/x/consulting/dynatext_dynaweb.html, (accessed June 15, 2008).

academic and educational institutions to obtain copies, it appears to have been priced out of the market. The online retailer Amazon.co.uk¹¹⁶ currently prices the CD-ROM at between £334 and £502.

Methods of Encoding

The materials on the disk have been encoded using SGML (Standard Generalized Markup Language), a metalanguage which is used to describe how the text is marked up. It is also useful for managing the large number of documents within the application, and the raw SGML code is also available to users who wish to view it and indeed print it. The application also incorporates the TEI standard. The authors appear to have chosen to encode all available aspects of the text, and to include variant words as staging comments, except when whole lines differ; these are then indicated in coloured type. Within the Finder Text, variations between editions are also signified by colour.

The STATUS attribute is used to mark the text as green or blue, which indicates that this text can only be found in either the Folio or the Quarto. For example, a <STATUS="Qonly"> attribute tag indicates that the text within the tags is included only in the Quarto, similarly "Fonly" indicates it is only present in the Folio.

¹¹⁶ *King Lear Text Performance CD-ROM* (LAN Licence), http://www.amazon.co.uk/King-Lear-Text-Performance-CD-ROM/dp/0521794196/ref=sr_1_9?ie=UTF8&s=books&qid=1214176894&sr=8-9 (accessed June 15, 2008) and *King Lear Text Performance CD-ROM* (WAN Licence), http://www.amazon.co.uk/King-Lear-Text-Performance-CD-ROM/dp/0521794188/ref=sr_1_4?ie=UTF8&s=books&qid=1214176996&sr=1-4 (accessed June 15, 2008).

Methods of Interaction

I did find however that the green markings from the Folio edition were so dark that it was difficult to distinguish them from that of the regular black text. The plain black text can also be misleading, in that it is impossible to tell when the cursor is not over a line whether there is in fact a link there. If a link is present, the cursor will turn into a finger pointing at the text, and clicking on this will open a small window containing staging commentary.

In a way, the material might just as well have been available on paper, were it not for aspects such as the search facility or the links within the finder text to other resources (albeit involving the opening of more windows). The medium of the e-book has yet to evolve in order for the wealth of materials contained within this work to be fully appreciated.¹¹⁷

I was fortunate to meet the author Dr Christie Carson at an English and New Technology Day run by the English Subject Centre at the University of London, and was able to ask her briefly about the problems she'd encountered developing a multiple text edition. The main issue seemed to have been that the application remained untested as it was being developed – no formal testing or trials of the software were undertaken before it was published, and therefore no user comments could be fed back into the design process. This concern has fed my interest in the importance of user testing

¹¹⁷ Stephanie Thomas, review of *The Cambridge King Lear CD-ROM: Text and Performance Archive*, by Christie Carson and Jackie Bratton, *Renaissance Forum*, Volume 6, Number 2, Winter 2003, <http://www.hull.ac.uk/renforum/v6no2/thomas.htm> (accessed June 15, 2008).

and feedback in applications for Humanities Computing, and is an area where fewer documented examples have been published.

5.3.2 The Arden Shakespeare CD-ROM

The Arden Shakespeare CD-ROM: Texts and Sources for Shakespeare Study, is an exhaustive resource which combines text with accompanying supporting material. Included on the CD-ROM are introductions, bibliographies, commentaries, lists of variants, a search facility, facsimile images, and “the capacity to read one or more of these on-screen, adjacent to the modern-spelling Arden text and to make direct comparison between Folio and Quarto versions of a speech or scene.”¹¹⁸

An example from *All's Well That Ends Well* can be seen in Fig. 4 , which shows the use of the search facility, as well as the comparison between digital copy and facsimile.

“All facsimiles are linked to the Arden in such a way that scrolling through the modern text automatically causes the facsimile(s) to move in parallel.”¹¹⁹ Designed using the DynaText software, which I mentioned earlier in this chapter in conjunction with the *Cambridge King Lear CD-ROM*, the *Arden Shakespeare CDROM* has a similar look and feel. The GUI (Graphical User Interface) is one which is synonymous with older Windows programs, and the

¹¹⁸ Jean Chothia, “Review: The Arden Shakespeare: Texts and Sources for Shakespeare Studies on CD-ROM, *Computers & Texts* 15 (1997): 17-18.

¹¹⁹ Andrew Murphy, “Electric Shakespeares, *The Arden Shakespeare CD ROM*”, *Computers and the Humanities* 32 (1998): 417.

use of primary colours to highlight stage directions (green), and character names (red) is one of the simpler aspects of the software.

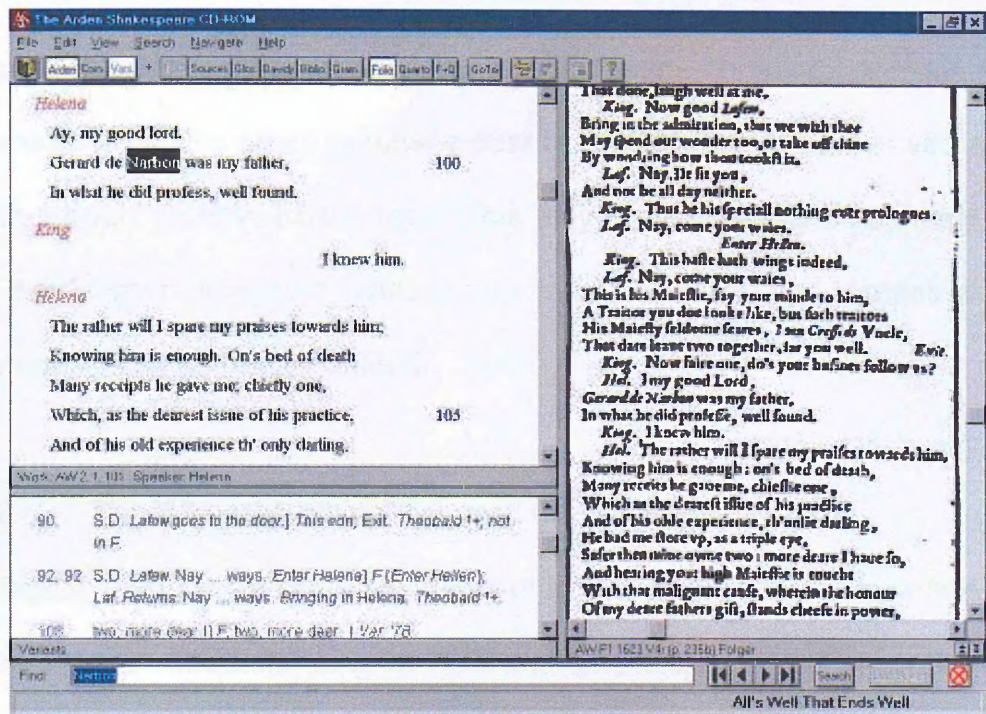


Fig. 4 Viewing *All's Well That Ends Well* on The Arden CD-ROM

The texts themselves are taken from *The Arden Shakespeare* second edition (Arden 2), though the decision to do this has been heavily criticized by Jean Chothia in her review¹²⁰, as this was not the most recent edition of the Arden at time of print. However, as an educational resource for learning and teaching the Arden Shakespeare CD-ROM is most useful.

"...hypertextual editions such as the *Arden Shakespeare CD-ROM* have a distinct strength in what they make immediately available to the reader...

¹²⁰ Chothia, "Review: The Arden Shakespeare", 17.

allowing and encouraging the use of a number of critical and scholarly resources because of their seamless integration with the literary edition.”¹²¹

Despite the hefty price tag which accompanied its initial release being reduced by half, the steep purchase cost of £2500 is mentioned in virtually all of the product reviews I have read. This may have acted as a deterrent to all but the largest academic institutions, and availability and access to this resource is now extremely limited.

5.3.3 The Wife of Bath’s Prologue on CD-ROM

“By highlighting the most crucial points of textual variation, and by leading the reader into an understanding of how and why this variation arose at these points, we can make this connection between variation and meaning in the most useful way.”¹²²

In “The One and the Many Texts”, Peter Robinson refers to “the cunning of hypertext”¹²³ – the technological ability of electronic editions to link together many different sources, and to present multiple witnesses and facsimiles, images, bibliographies and commentaries. “Editors should use the computer technology to present all the various forms of the text in all the various witnesses... In the world of hypertext, all texts are (or should be) equal.”¹²⁴ He also refers to the advantage of utilizing one text to enable the exploration of

¹²¹ Raymond G. Siemens, “Review of *The Arden Shakespeare CD-ROM: Texts and Sources for Shakespeare Study*”, *Early Modern Literary Studies* 4.2 (September, 1998): 28.1-10.

¹²² Robinson, “The One and the Many Texts”, 13.

¹²³ Peter Robinson, “The One and the Many Texts”, *Literary and Linguistic Computing* 15 (2000): 5.

¹²⁴ Robinson, “The One and the Many Texts”, 6.

many other versions of the text, and makes reference to the use of a base-text.

*The Wife of Bath's Prologue CD-ROM*¹²⁵ makes use of a base-text, however Robinson is quick to defend this decision by suggesting that "the unmodernized spelling and absence of any modern punctuation in the base text"¹²⁶ is intended to dissuade users from reading it as a standalone text, and that it should instead be used as a starting point from which all variations can be compared. The aim of the project is to reveal the history of the text by examining and presenting multiple witnesses (fifty-eight in total) electronically.

"The CD-ROM contains two word-by-word collations of the witnesses: a 'regularized spelling' and an 'unregularized spelling' collation"¹²⁷ fully encoded in SGML. The edition also contains "a full record of all the original sources for the work, with sophisticated search software and scholarly apparatus."¹²⁸ Again, DynaText is employed to handle the wealth of textual and visual data, as well as the search facility. There is no denying that this is a significant piece of work as an electronic edition, and as a tool by which to compare textual variants.

¹²⁵ P. M. W. Robinson, ed., *The Wife of Bath's Prologue on CD-ROM*, (Cambridge: CUP, 1996).

¹²⁶ Robinson, "The One and the Many Texts", 6.

¹²⁷ Peter Robinson, "The Wife of Bath's Prologue on CD-ROM: Editor's Introduction", <http://www.canterburytalesproject.org/pubs/wobintr.html> (accessed February 1, 2009).

¹²⁸ Cambridge University Press catalogue description of *The Wife of Bath's Prologue on CD-ROM*, <http://www.cambridge.org/uk/catalogue/catalogue.asp?isbn=0521465931> (accessed February 1, 2009).

5.3.4 The Enfolded *Hamlet* (electronic version)

In Bernice Kliman's "The Enfolded *Hamlet*"¹²⁹ (which combines the Second Quarto and First Folio of the text), curly brackets distinguish Q2-only elements and pointed brackets F1-only elements. These are also colour-coded, with the common text in black, the quarto only text in green, and folio text in red (as can be seen in Fig. 5 below).

1008 *Pol.* That hath made him mad.
1009 I am sorry, that with better {heede} <speed> and iudgement
1010 I had not {coted} <quoted> him, I {fear'd} <feare> he did but trifle
1011 And meant to wrack thee, but beshrow my lelousie:
1012 {By heauen} <It seemes> it is as proper to our age
1013 To cast beyond our selues in our opinions,
1014 As it is common for the younger sort
1015 To lack discretion; come, goe we to the King,
1016 This must be knowne, which beeing kept close, might moue
1017 More grieffe to hide, then hate to vtter loue, <Exeunt.>
1017 {Come. Exeunt.}
1018 <Scena Secunda.>
1019 {Florish.} Enter King {and} Queene, {Rosencraus} <Rosinocrane> and
1019-20 {Guyldensterne} <Guild-] sterne Cum alijs>.

Fig. 5 An extract from The Enfolded *Hamlet*

The levels of interactivity in the edition are limited to a very useful search facility allowing the user to search for a word, phrase or through-line number, and buttons to view whole copies of the quarto or the folio, or the variants from each, or a combined "enfolded" version. There is no direct manipulation of the variants, but the edition has been foundational in my work.

¹²⁹ Bernice Kliman, "The Enfolded *Hamlet*", <http://www.leoyan.com/global-language.com/ENFOLDED/enhamp.php?type=EN> (accessed June 15, 2008).

From browsing the online Introduction to the Enfolded *Hamlet*, I was relieved to read that its author had encountered some of the same problems with the encoding of multiple texts as I had, for example deciding from which edition to display the line breaks. The Enfolded *Hamlet* shows the line breaks from Q2 as the main text, and line breaks in F are indicated by “|” (Pipe symbol). With the encoding of *King Lear*, I had to decide which line breaks to display in the initial text you see on screen. As I chose Q1 as my starting or base text, Q2 and F line breaks are encoded individually, so that, if a style sheet is used, it can identify where lines end in each edition e.g. `</BR ID="2">` which describes a line break in Q2.

I created a tag that would signify when the end of a line had been reached in each edition, so if you wanted to have the lines ending as they do in Q1, then this could be displayed, or if the line ends differently in the Folio, you could view the lines as they would be displayed in that edition. Taking Q1 as my starting point, the text has been encoded as the lines appear in Q1, but also containing the words which are common to Q2 and F (which in The Enfolded *Hamlet* are shown in black).

The Cambridge *King Lear* CD ROM has a similar level of colour coding, but the text has been encoding in SGML. The *Lear CD ROM* also has another similarity which appears in other multiple text editions I have looked at, in that it has a “Finder Text” or “starting-point text” if you will. The Finder Text is the

main text the reader can begin looking at when the application is opened, and all other editions can be accessed and compared from this starting text.

The Enfolded *Hamlet* provides a common text between all editions, and then offers firstly the Q2 text followed by the folio variants. In my application, it has been useful to have Q1 as my initial text, and then to provide Q2 and folio variants. I have had to produce tags in the encoding that are used purely for “keeping place” amongst the masses of text – these <element> tags each have a unique ID based on the line numbering of Q1. However, as I mentioned earlier, the line breaks in the other two editions could be displayed alternatively depending on the requirements of the reader.

The Enfolded *Hamlet* has been encoded using HTML tags, which must have been an extremely time-consuming task to complete. The biggest problem with not having a descriptive tagging scheme of some kind, is that it is difficult (particularly with longer texts) to make future changes or to be updated by someone other than the author. By not using and documenting tags which describe the text and editorial decisions, it makes it more difficult to store, share and edit that material for use in future projects.

For example, whilst working on *King Lear* I decided that character names within the text could perhaps be better displayed by distinguishing them from any stage direction reference to that character. Of course it is quite straightforward to type in “replace all” and alter the tag, but when a character name is displayed in a number of different ways (for example, in full:

“Cordelia”, a shortened version “Cord.”, a even more shortened version “Cor.” (which could in effect be short for Cornwall), and also within a stage direction. I found it considerably easier therefore to search by a more specific tag for that shortened character name, although this could also be changed by amending the code in the XSL style sheet, which immediately alters the appearance of the document.

5.3.5 The MITH Versioning Machine

The Versioning Machine¹³⁰ is “a software tool designed by a team of programmers, designers, and literary scholars at the Maryland Institute for Technology in the Humanities (MITH)”¹³¹ that allows for the displaying of multiple versions of encoded texts. A base text is provided on the left hand side, and the reader can choose from a drop-down box and select and view any two of X versions of a text side-by-side in order to compare variations between the two. Fig. 6 shows two versions of a four-line poem by Emily Dickinson. On the right hand side the drop-down box provides 6 other versions of the text which can be selected to compare.

¹³⁰ The Versioning Machine at Maryland Institute for Technology in the Humanities (MITH), <http://www.v-machine.org> (accessed June 15, 2008).

¹³¹ An overview of The Versioning Machine, <http://v-machine.org/documentation.php#over> (accessed June 15, 2008).

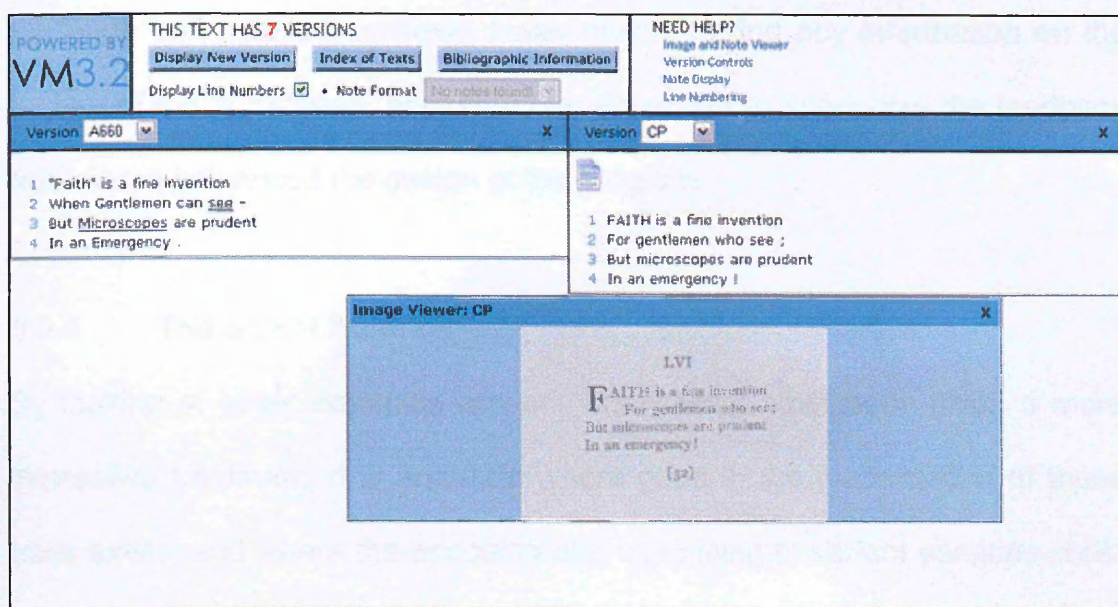


Fig. 6 An Emily Dickinson poem viewed with The Versioning Machine.

The Versioning Machine also has a very interesting visual facility available for certain versions, enabling a reader to view an image of the paper copy for that version (see the “Image Viewer” box in Fig. 6 above). The image appears as a transparent overlay, and can be moved around the page by the mouse yet still allows for the typed copies of the text to be viewed beneath. This appears to be a slightly newer development in the application, and can also be compared with the concept of the Collator and of the “They Flee From Me” Transparencies interface (Fig. 3) both mentioned earlier in this chapter.

In addition to their novel approach to displaying multiple texts, what is perhaps most interesting and valuable about The Versioning Machine project, is that the process of development has been documented. An account of the methodology of encoding the texts enables a greater understanding of the practice of editing using guidelines such as those of the TEI, and in particular the customization of those guidelines. This documented material is very

thorough and detailed, however I was unable to find any information on the testing of the application, and would be interested to know how the feedback from users influenced the design of the program.

5.3.6 The SCETI Editions

By looking at other examples of work where texts have been given a more interactive treatment, it is apparent where gaps in the presentation of these texts exists, and where the encoding and combining of variant versions could be beneficial. A good example of this is The Furness Shakespeare Library at the Schoenberg Centre for Electronic Text and Image (SCETI).¹³² All the included Shakespearean texts have been scanned in, rather than encoded, allowing for the reader to see the old print spellings and any possible printing features first hand. However, as no additional editing has been completed on these texts, they cannot really be described as electronic editions in the same way that an encoded edition can be; they are simply scanned in reproductions of the text.

Readers can nevertheless compare the editions of a specific text side by side using frames, but they cannot do this combined as “one” text, and the SCETI edition has no interactive features other than the navigation buttons. Pages are relatively slow to load, as each frame is a large scanned picture as opposed to text. The SCETI example does not appear to be intended for use as a tool to promote instruction on the processes of editing or for active

¹³² William Shakespeare, *King Lear* (Folio), at The Schoenberg Centre for Electronic Text and Image (SCETI), http://dewey.library.upenn.edu/sceti/printedbooksNew/index.cfm?textID=lear_f1&PagePosition=1 (accessed June 15, 2008).

reading specifically, but more of a way to facilitate readers viewing the typefaces as they were in the seventeenth century. Their mission is to “...make accessible to the global community of scholars and researchers primary source materials that would otherwise be difficult to access.”¹³³

5.3.7 The Internet Shakespeare Editions (ISE)

The Internet Shakespeare Editions (ISE)¹³⁴ based at the University of Victoria, provide a portal for the exploration of Shakespeare's plays (and poems) in text and performance. Each text is presented in several encoded versions, and includes links to facsimile images, as well as performance information and a historical background. The ISE are predominantly text-based, and allow for comparison of variant quarto and folio editions, although not on the same screen. I have been able to make considerable use of the ISE resources in encoding part of *King Lear*, and found the site very accessible, although the issue of excessive scrolling is ever present, despite allowing for plays to be divided into Acts and Scenes.

5.3.8 Textarc

Textarc¹³⁵ is an example of an extreme representation of an electronic edition, and in fact may not be considered to be an edition at all in traditional terms. It appears to have been the intention of its creators to reproduce a text as “Art” rather than developing it as a usable tool for learning purposes. Fig. 7 and Fig. 8 below, show screenshots from a rendering of *Hamlet* completed using

¹³³ SCETI Mission Statement, <http://dewey.library.upenn.edu/sceti/mission.cfm?nav=aboutmission> (accessed June 15, 2008).

¹³⁴ Internet Shakespeare Editions (ISE), University of Victoria, <http://internetshakespeare.uvic.ca> (accessed June 15, 2008).

¹³⁵ Textarc, <http://www.textarc.org> (accessed June 15, 2008).

Textarc. You can see the “arc” in Fig. 7 where the limits of the text connections reach.



Fig. 7 A screenshot of the text of *Hamlet* rendered using Textarc

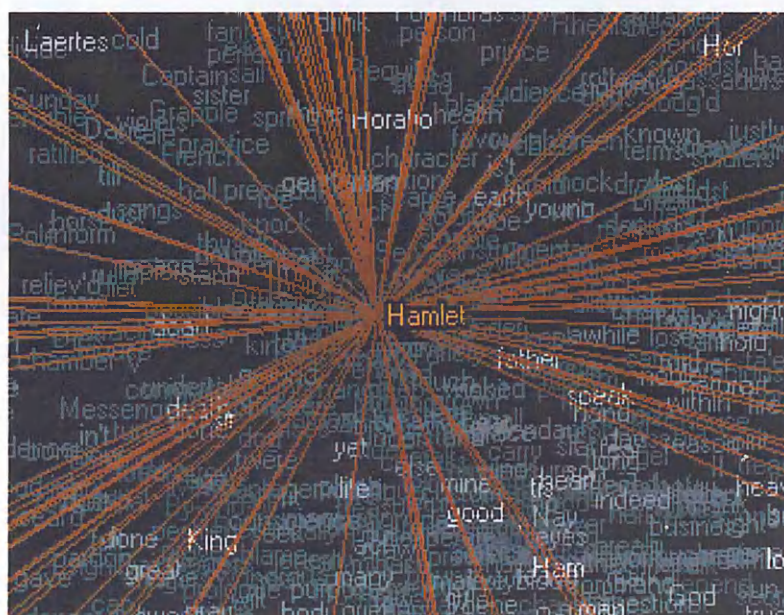


Fig. 8 Textarc *Hamlet* in close-up

The Textarc project could be summed up by the following (though unrelated) quotation from Terry Eagleton: “Every literary text is made up of number of “systems” (lexical, graphical, metrical, phonological and so on), and gains its effects through constant clashes and tensions between these systems.”¹³⁶ Textarc makes use of connections in the text to produce a map of sorts, providing a very visual representation of literary works.

Another program that uses a similar system, though not specifically for literary texts, is the Visual Thesaurus¹³⁷ developed by Thinkmap. This program makes connections between the meanings of words in order to display a visual map of related words for the user to choose from. Fig. 9 shows that the word “train” has been entered in the search box, and the subsequent map created then displays all available words that could be related to the meaning of the word “train”.

It would be interesting to apply this approach in teaching the text of *King Lear*, particularly in relation to words which could have more than one meaning in the context of the play(s), for example the word “ponderous”.

¹³⁶ Eagleton, *Literary Theory: An Introduction*, 88.

¹³⁷ The Visual Thesaurus, <http://www.visualthesaurus.com> (accessed June 15, 2008).

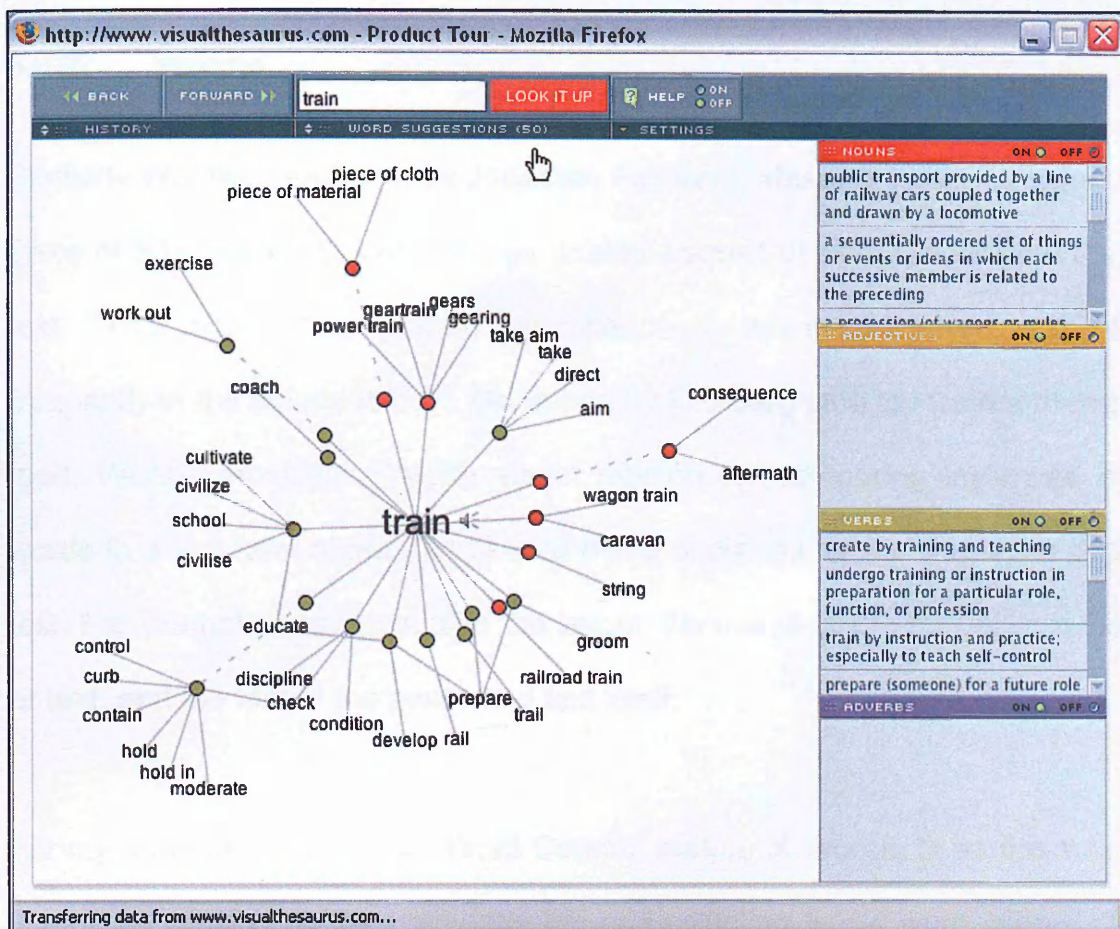


Fig. 9 A screenshot from a page of the Visual Thesaurus.

5.3.9 Wordle

Similarly Wordle, developed by Jonathan Feinberg, allows the user to enter a piece of text, and the system then generates a series of word clouds from that text. “The clouds give greater prominence to words that appear more frequently in the source text”¹³⁸. Described by Feinberg as a toy (rather than a tool), Wordle provides a highly visual method for comparing instances of words in a text, and allows the user to make decisions for the display of that text. For example, users can alter the layout, the use of colour for background or text, and the font of the generated text itself.

For my purposes I found the “Word Counts” feature of Wordle to be the most useful. By clicking on the Language tab and selecting “show word counts”, a separate window pops up to display a long list of all the words from your chosen source text, and next to each word is the number of instances of that word (basically, the non-visual back-end of Wordle). I experimented with this by simultaneously entering the texts from my three editions of *King Lear* – F, Q1, Q2.

As this is an alphabetical list it allows you to view words with similar spellings and the number of instances of those words in the text. Fig. 10 shows three texts of *King Lear* as processed by Wordle, including the popup word count list.

¹³⁸ Jonathan Feinberg, “Wordle”, <http://www.wordle.net> (accessed February 1, 2009).

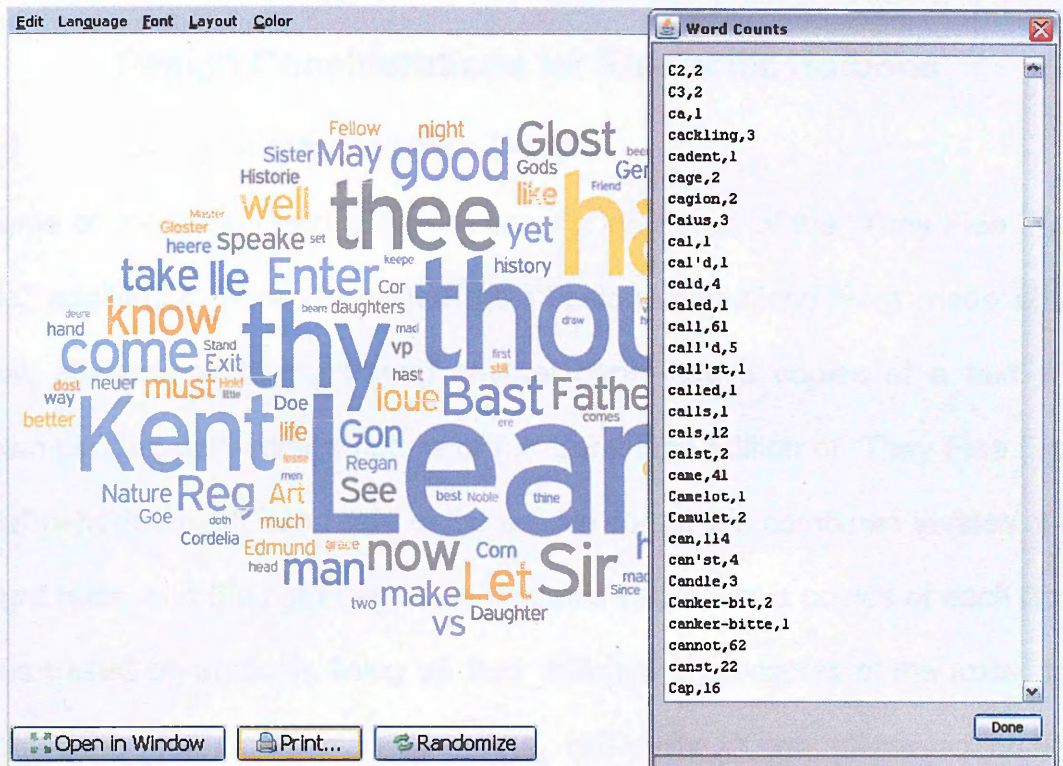


Fig. 10 Three texts of *King Lear* viewed using Wordle

Wordle does not however tell you from which text each word comes, but then this is not the purpose of the software. Word cloud software has the possibility of use for interpreting texts on a basic level. It can provide a talking point for use during student seminars when studying a literary text, and would work well as an overview or introduction to a text.

6 Design Considerations for Electronic Editions

6.1 Design Implementation Details

Some of the initial designs for the varying interfaces of the “They Flee From Me” application were completed after basic observations were made about how students were comparing several paper-based copies of a text. For example, the split-screen nature of the Combined edition of “They Flee From Me” (where the left hand side of the screen contains a combined version of all eight texts, and the right hand side contains single whole copies of each text), was based on students lining up their different photocopies of the texts, and comparing them side by side – but, obviously in the electronic edition, interactivity means that the editions can be combined together, rather than having to have separate copies of all eight texts.

6.2 A Brief Characterisation of User Groups

Researchers

Motivation: To use the edition for research purposes - whether to research into the play itself, or to undertake a study of the editing process or of variants and their associated versions.

Expected Outcomes: Retrieving the data specific to their research, gaining information about that data, gaining experience of using such an application/ research tool.

Students

Motivation: To use the edition for learning, and to want to understand the material, and the process behind the creation of the various editions. To gain experience of using an electronic edition of this kind.

Expected Outcomes: Understanding the editing process, understanding the play, ability to make independent choices based on the use of the tool provided.

Teachers

Motivation: The need to offer an interactive facility for students, to enable greater understanding of the material and the processes. To allow for an alternative learning medium to be integrated into the classroom.

Expected Outcomes: To enable independent choice-making by students, to achieve an understanding of an alternative method of teaching using a non paper-based medium.

Editors of future editions

Motivation: To investigate the advantages and disadvantages of developing an electronic scholarly edition. The need to visualise and manipulate a new e-edition.

Expected Outcomes: To gain experience of the edition for use in developing future editions. To identify elements of the edition which could be applied to a future edition of any other piece of text with several versions and variants.

6.3 Scenarios of the Process of Editing

By looking at various hypothetical scenarios of the process of editing, it is possible to uncover some of the factors that may contribute to the outcome of a piece of edited text. In *Unediting the Renaissance*, Leah Marcus discusses in detail the implications for editing *Hamlet*, and the circumstances which have motivated editors.

...literary value is contingent: the degree and kind of artistry we attribute to a given play or poem will depend not only on the particular era we inhabit, but also on our specific situation within that era – the cultural group we come from, belong to, aspire towards.¹³⁹

Taking this into consideration, a brief set of questions to consider might include:

- What exactly influences an editor when making editorial decisions?
- How significant are the external experiences of an editor in affecting their ability to be unbiased towards the text or texts?
- Do factors such as time and money affect the outcome of an editor's work, for example if the work has to be done within a limited time frame,

¹³⁹ Leah S. Marcus, *Unediting the Renaissance: Shakespeare, Marlowe and Milton* (London & New York: Routledge, 1996), 136.

are they more likely to choose the path of least resistance, or will they make editorial choices based on thorough research?

Scenario 1:

Influenced by all external factors, influenced by personal experience, for example, an editor who has experienced personal tragedy might respond differently to a tragic text, than someone who has not. The editor might select words that are more personal to them, than those words which might be most appropriate for the edition.

Scenario 2:

The editor has time-constraints, and makes decisions based purely on comprehensibility, rather than attempting to be true to any original text, aims of the author, or differentiate between multiple versions of the text. The editor may choose a word from a selection based purely on ease of understanding for the reader – the simplest choice, rather than perhaps the most appropriate.

Scenario 3:

The editor may make decisions based on his or her available methods of publication – for example, if only certain fonts are available, the editor must make their selection knowing that they can only publish using modern fonts, and could not for example print old style characters.

Scenario 4:

The text is available in too many languages for the editor to be able to accurately select variants from the different versions; they therefore choose to select from only the most similar languages, or those of which they have the greatest understanding.

6.3.1 The New Bibliography

To look at an idealised view of editing, the New Bibliographers were scholars employing an editorial method which lent considerable weight to the importance of materialism. "New Bibliographers were ultimately dedicated to the thoroughly idealist aim of reconstructing, by inference from the evidence of surviving printed texts, the form and contents of Shakespeare's lost manuscripts."¹⁴⁰ A scenario of this nature is concerned more with the physical form and process of the creation of the text, than with its literary interpretation.

6.4 Discussing Methods of Viewing

In a seminar or classroom situation in the computer lab, I decided that as the students would be using their own computers to view the texts rather than viewing the tutor's screen via a projector as would be the case during a lecture, there would be less of a need for larger fonts to be included in the text as a default. The students would have their own personal screens and be

¹⁴⁰ Graham Holderness. *Textual Shakespeare: Writing and the Word* (Hatfield: University of Hertfordshire Press, 2003), 57-8.

able to adjust the size of fonts themselves, as well as navigate independently from the tutor and to read through the text with more control.

A more suitable tool for reading in this kind of environment would therefore be a combined version of the texts – an interactive edition which would allow readers to produce their own version of the text by clicking on variant words, examining and rearranging them. I then produced a “mock up” design for the purpose of briefly illustrating the possibilities for displaying the texts.

I discussed ideas with my supervisor about: creativity, forms of “personal editing”, of the potential for composition and creative thought, “pick n’ mix” variants, opportunities for scholars to construct a historical reading from their own knowledge and understanding, and to be able to select a method by which they interact with/read/use the text(s). A brief discussion began of the possibility of including a “zoom” facility within the application, and of having different interfaces for different purposes i.e. for lectures or seminars.

Fig. 11 (below) is based upon an online experiment I came across which uses Macromedia Flash MX to display the whole of William Blake’s poem “The Tyger”¹⁴¹, while allowing the reader to focus in on several lines more closely. This example illustrates the possibility of using a zooming facility or “fisheye” display to enable readers to more closely examine one specific part of the text, yet at the same time to be able to view the text in its entirety. This

¹⁴¹ Samuel Wan, “Fisheye Menu in Flash MX”, <http://www.samuelwan.com/downloads/com.samuelwan.eidt/fisheyemenu/FisheyeMenuDemo.html> (accessed June 15, 2008).

method was deemed most appropriate for use when projected on to a screen during lectures, as a large screen would be able to display whole copies of the text, yet at the same time focus in on specific passages – making it more straightforward to view how far into the whole text you are.

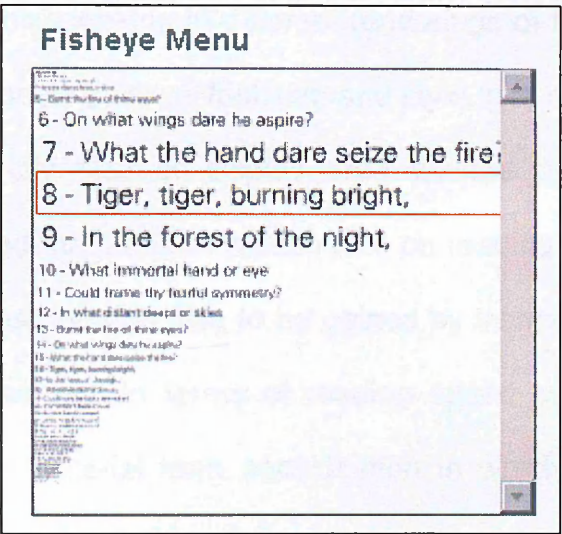


Fig. 11 A fisheye style menu for William Blake’s poem “The Tyger”.¹⁴²

“Although interactive fisheye views are a solution to the screen space problem”¹⁴³, and the concept of using fisheye or zoomable interfaces is interesting to consider, and I have chosen not to pursue trials of this kind of interface as it is a more effective method as an overview, rather than as a tool for editing.

¹⁴² Ibid.

¹⁴³ Carl Gutwin and Chris Fedak. “A Comparison of Fisheye Lenses for Interactive Layout Tasks”, *Proceedings of Graphics Interface 2004*, London, Ontario, Canada, May 17 - 19, 2004: 213-220.

6.5 The Interface

6.5.1 Alternative Methods of Interaction and Display

Looking at alternative methods of interaction would consist of examining the potential of JavaScript to transform the text into a more interactive tool. It would therefore involve looking at different renderings of the final application, and considering aspects such as font size and style, use of colour and layout, scrolling and possibly size of display area for the text. Duchnicky and Kolars¹⁴⁴ investigated the effect of screen size on reading constantly scrolling text and reported that there is little to be gained by increasing display size to more than four lines with in terms of reading speed or comprehension.¹⁴⁵ Kastan agrees "the material form and location in which we encounter the written word are active contributors to the meaning of what is read."¹⁴⁶ It is therefore essential that the interface of the application be as clear and simple as possible to read text from, in order not to differ excessively from the original medium or paper-based editions of the text.

6.5.2 A Scripting Language

The use of JavaScript to enable interactive display mechanisms has proved effective in being able to combine the varying editions of a text, however there are other tools for designing interactivity such as Macromedia Director or Flash (each with their own scripting languages). I have designed trials of several of the different methods of display which were designed by myself

¹⁴⁴ Robert L. Duchnicky and Paul A. Kolars, "Readability of text scrolled on a visual display terminal as a function of window size", *Human Factors*, 25 (6) (1983), 683-92.

¹⁴⁵ Dillon, *Designing Usable Electronic Text*, 45.

¹⁴⁶ Kastan, *Shakespeare and the Book*, 2.

and also by Dr Chris Roast, using JavaScript. These include interfaces involving the colouring of different variants, layering of the texts of different editions, a drag-and-drop interface, as well as making the variants appear randomly within a combined edition of all the texts. It would also be interesting to look at the possibility of using “tooltips” or other rollover methods, involving the concealing and revealing of sections of text.

6.5.3 Vertical scrolling

The problem of vertical scrolling is a factor in the design of many electronic editions. In the Internet Shakespeare Editions and also in *The Enfolded Hamlet*, plays can be viewed in their entirety on one single webpage, which using HTML inevitably means considerable scrolling. It is possible to view the plays divided in to smaller segments such as Acts or Scenes, however the issue of scrolling still remains depending on the number of lines.

6.6 Navigation Issues and Tools

6.6.1 The Edition as a Tool

“Tools have intrinsic properties, such as size and portability, but their qualities as components of design are not inherent in their structure, they only arise through usage”¹⁴⁷. The tool can be most effectively improved through evaluation and user interaction, and it is important that the tool itself never become a hindrance to completing the task.

¹⁴⁷ Mike Sharples, “An Account of Writing as Creative Design”, *The Science of Writing*, eds. C. M. Levy and S. Ransdell (Hillsdale, New Jersey: Lawrence Elbaum, 1996).

The use of empirical methods to assess the suitability of the edition – for example, employing an indirect observation technique such as creating an interaction log which could record all the user's key presses¹⁴⁸, mouse clicks and so on. This would enable the user to manipulate the application without any outside influence, and would perhaps give a truer view of whether an individual student could achieve their objectives in using the application, for the first time in for example a classroom situation.

6.7 The Issue of Onscreen Reading

6.7.1 Simultaneous Versions on Screen

After examining varying versions of the application, frames have been used to display two copies of the poem at the same time. The frame on the left hand side shows a combination of eight editions of the poem, with an interactive element enabling users to click on variant words in the text. The frame on the right hand side displays one version of the poem at a time, with hyperlinks allowing the user to move between editions.

6.8 A Glossary of Terms

A Glossary of Terms has been collected for use both in the editing process and as a reference guide for use between interdisciplinary departments for the supervisory team. This has been included in basic form in Appendix 1.1 and 1.2.

¹⁴⁸ Jennifer Preece, Yvonne Rogers, and Helen Sharp, *Interaction Design: Beyond Human-Computer Interaction* (New York: John Wiley & Sons, 2002), 365.

7 **Prototype Implementation**

7.1 **A Prototype Electronic Edition – “They Flee From Me”**

A prototype edition¹⁴⁹ has been generated by encoding various texts of a poem by Sir Thomas Wyatt in XML, employing various methods for displaying the material. An example of such variants is evident in editions of the poem, taking just the last two lines of two of the editions:

(from the unmodernised edition) "But syns that I so kyndely ame serued,
I would fain knowe what she hath
deserued".

(from the first printed edition) "But, sins that I vnkyndly so am serued.
How like you this, what hath she now
deserued?"

In the case of “They Flee From Me” there are at least eight editions immediately available, with no agreed “original” – each edition varies in aspects such as spellings and grammatical forms, to the extent that material inconsistencies appear between them. As this is an electronic edition, I decided to take the eight different editions of the poem from a variety of available online sources:

¹⁴⁹ Stephanie Thomas and Chris Roast, “They Flee From Me” Prototype Edition, October 2002. This can be accessed in Appendix 3.1 on the accompanying DVD. (NB: this site is designed to be used with Internet Explorer only).

The first edition termed “#1 Unmodernised Version”¹⁵⁰ was taken from the University of Cambridge’s virtual classroom in the Faculty of English. This version was pre-1557. In 1557 printer and editor Richard Tottel produced an edition of the text, which can be seen in #2 “First Printed Version”¹⁵¹ – also taken from the University of Cambridge’s virtual classroom site. This was published by Tottel as *Songes and Sonettes* (or *Tottel's Miscellany*). #3 “Univ Toronto Version”¹⁵² can be found at the University of Toronto and is edited by Ian Lancashire. The source text for this version is the British Library Egerton MS 2711, fol. 26v; Richard Harrier, *Canon* (1975): 131-2.

Version #4 “London 1913”¹⁵³ is taken from the Shakespeare’s Sonnets website run by Oxquarry Books, which in turn takes its source text from *The Poems of Sir Thomas Wyatt* edited by A. K. Foxwell, London, 1913. The #5 “Modern Spelling Version”¹⁵⁴ is provided by the webmaster of this site. There is no information about the provenance of #6 “Netpoets Version”¹⁵⁵, however, #7 “London 1904 Version”¹⁵⁶ is from the Luminarium: Anthology of English Literature site, and takes its source from *The Poetical Works of Sir Thomas Wyatt* edited by James Yeowell, London, published by George Bell and Sons,

¹⁵⁰ Colin Burrow, ed., “They Flee from Me: Unmodernized Version”, The Virtual Classroom, Faculty of English, University of Cambridge, <http://www.english.cam.ac.uk/vclass/class1/non-modern.htm> (accessed February 1, 2009).

¹⁵¹ Colin Burrow, ed., “The Flee from Me: The First Printed Version”, The Virtual Classroom, Faculty of English, University of Cambridge, <http://www.english.cam.ac.uk/vclass/class1/first-printed.htm> (accessed February 1, 2009).

¹⁵² Ian Lancashire, ed., “They flee from me that Sometime did me Seek” by Sir Thomas Wyatt, University of Toronto, Department of English, <http://rpo.library.utoronto.ca/poem/2407.html> (accessed February 1, 2009).

¹⁵³ Gerard R. Ledger, ed., “They Flee from Me” (London, 1913), Shakespeare’s Sonnets website, Oxquarry Books Ltd., <http://www.shakespeares-sonnets.com/Wyatt4.htm#anchor011> (accessed February 1, 2009).

¹⁵⁴ Gerard R. Ledger, ed., “They Flee from Me” (modern spelling version), Shakespeare’s Sonnets website, Oxquarry Books Ltd., <http://www.shakespeares-sonnets.com/Wyatt4.htm#anchor011> (accessed February 1, 2009).

¹⁵⁵ Ron Carnell, ed., “They Flee from Me That Sometime Did Me Seek” (Netpoets Version), Passions in Poetry website, <http://www.netpoets.com/classic/poems/075006.htm> (accessed February 1, 2009).

¹⁵⁶ Anniina Jokinen, ed., “The Lover Showeth How He Is Forsaken Of Such As He Sometime Enjoyed” by Sir Thomas Wyatt, Luminarium: Anthology of English Literature, <http://www.luminarium.org/renlit/theyflee.htm> (accessed February 1, 2009).

1904. 32. Lastly, #8¹⁵⁷ the “Chadwyck Healey Version” was retrieved from the Literature Online database, this came from the source poem “The louer sheweth how he is forsaken of such as he sometime enjoyed” published in *Songes and Sonettes*, London, 1557.

Amongst the eight different versions of the poem selected for the prototype edition there appear to be two predominant groupings of textual similarities. Tottel’s version seems to have influenced a number of these texts in their current state, which can be noted by their alternative titles (although the titles of individual versions have not been included in the prototype). Other versions, in particular #1 and #3 can be viewed as evolving from the British Library Egerton MS 2711.

In collaboration with Dr Chris Roast from Sheffield Hallam University’s School of Computing, a prototype electronic edition of the poem “They Flee From Me” by Sir Thomas Wyatt was encoded using XML. The eight available published editions of the poem were collated to form a “Combined” version of the poem. This enabled the textual variants between the eight versions to be effectively hidden from the user at first glance, until they clicked on highlighted question marks in the text and the hidden words or phrases appeared.

¹⁵⁷ Literature Online, “The louer sheweth how he is forsaken of such as he sometime enjoyed” by Sir Thomas Wyatt, Cambridge, Chadwyck-Healey, 1992. http://gateway.proquest.com/openurl?ctx_ver=Z39.88-2003&xri:pqil:res_ver=0.2&res_id=xr i:lion&rft_id=xri:lion:ft:po:Z200438428:2 (accessed February 1, 2009).

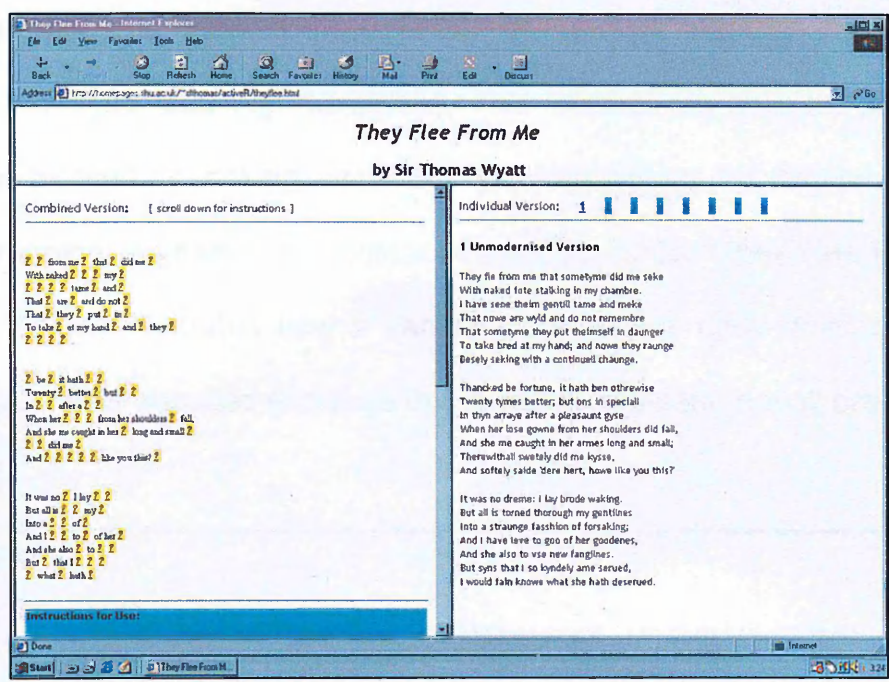


Fig. 12 The “They Flee From Me” interface using frames

To do this, a combination of XSL and JavaScript was employed, enabling a cycling effect of the variants - each time the user clicked on one of the question marks (“choicepoints”), a word would appear from a different edition of the poem. For example, in the lines below taken from two editions of the poem, it is clear that the word “kindly” completely changes its meaning in a second edition of the poem

(unmodernised edition)	“But syns that I so kyndely ame serued, I would fain knowe what she hath deserued”.
(first printed edition)	“But, sins that I vnkyndly so am serued. How like you this, what hath she now deserued?”

A design rationale enabled the definition of the XML mark-up scheme used for the prototype (see Fig. 13 below). This involved an account of editorial process, as well as making decisions with implications for display, such as word wrapping. An example segment of the XML file for “They Flee From Me” (shown below) illustrates how a variant word, in this case “thin” or variant spellings of it, is encoded (note: as this is only a segment, not all brackets are closed):

```
<line ID="10">
  In
    <versions>
      <version><text>thyn</text><id>1Unmodernised</id></version>
      <version><text>thinne</text><id>2FirstPrinted</id></version>
      <version><text>thin</text><id>3UnivToronto</id></version>
      <version><text>thyn</text><id>4London1913</id></version>
      <version><text>thin</text><id>5ModernSpelling</id></version>
      <version><text>thin</text><id>6Netpoets</id></version>
      <version><text>thin</text><id>7London1904</id></version>
      <version><text>thinne</text><id>8ChadwyckHealey</id></version>
    </versions>
```

Fig. 13 An example segment of XML encoding for “They Flee From Me”

7.2 Developing a Tagset: My Example Encoding

I begin my encoding by developing a “tagset”, an example of which can be seen in Fig. 14 below. Appendix 3.4 also includes the Act I Scene I of *King Lear* which has been encoded using this method.

```
<element ID="2">
  <stagedir>
    Enter Kent,
    <versions>
      <version ID="1"><text>Gloster,</text></version>
      <version ID="2"><text>Glocester,</text></version>
      <version ID="3"><text>Glouces ter,</text></version>
    </versions>
    and
    <versions>
      <version ID="1"><text>Bas tard.<BR ID="1"/><!--Q1LAST2--></text></version>
      <version ID="2"><text>Bas tard.<BR ID="2"/><!--Q2LAST2--></text></version>
      <version ID="3"><text>Edmond.<BR ID="3"/><!--FLAST2--></text></version>
    </versions>
  </stagedir>
</element>
```

Fig. 14 An example of encoding from my original tagset

The excerpt displays three versions of the text of *King Lear* – two Quartos (1608 and 1619), and the Folio (1623). Q1 has been used as the central or base text, in order to compare the other texts to it. Each version is given an ID number Q1 is “1”, Q2 is “2”, and F is “3”. Punctuation marks have been grouped with their associated words, and capitalisation is not necessarily a variation as such, but can instead obviously exist when the previous word has ended with a full stop.

The use of the `<element>` tag, as I mentioned in Chapter 5, is present only as a marker for the encoder – so in Fig. 14 the tag `<element ID="2">` indicates to the encoder that the code within that element is based on line 2 in Q1 (as Q1 is the starting text). As line breaks do not always occur at the same place in all three versions, Fig. 14 also shows a tag which indicates a line break in each of the versions. For example, the tag `<BR ID="3"/>` points to a line break in just the folio, which is followed by a short note to the encoder `<!--FLAST2-->` signifying that this was the last word in line 2 of F).

Deciding whether to encode a character name differently when it appears within a stage direction, rather than as a prompt for the character's next speaking line, is an example which may not seem significant, but when the XSL is transforming different tags to do different things, the appearance of the name of a character can imply various intentions. For example, to italicise all character names or names in general throughout the text would be incorrect, as occasionally a name is mentioned which is not a character part – such as

Apollo. And in addition to this, names appear which could have a dual-meaning, for example the country of France and the character France.

However, after much consideration, I decided to revise my initial encoding scheme and adopt the TEI (Text Encoding Initiative) standard for encoding electronic text. Peter Robinson suggests “there is a special compartment reserved in hell for scholars who devise their own *ad hoc* markup systems”¹⁵⁸, as the use of one’s own markup scheme does not allow for encoded texts to be shared between groups of scholars and transportable across computer platforms.

The biggest difference between my original encoding scheme and the scheme which I finally adopted, is that I decided initially not to encode common words. Fig. 14 shows the word “and” which is not tagged in any particular version, but rather a shared word between versions. I felt that in revising the encoding, it would be more useful if all words were tagged, including those common between editions. This offers greater access to the text and allows for more choices in terms of displaying the text. It also provides information about textual similarities as well as differences. Fig. 15 shows that the same word “and” is shared between all three editions, so common words can be isolated from the rest of the text.

¹⁵⁸ Robinson, “New Directions in Critical Editing”, *Electronic Text: Investigations in Method and Theory*, 152.

7.3 The TEI and Parallel Segmentation

After making the decision to adopt the TEI's guidelines for encoding texts, I then had to decide how to encode three different texts together, and to contain their textual variants with no text being taken as the "base text", and the others as being variant readings of that. Parallel Segmentation sets aside the need for a base text, and "the texts compared are divided into matching segments all synchronized with one another. This permits direct comparison of any span of text in any witness with that in any other witness."¹⁵⁹

```
<!--ULN2-->
<p>
<stage type="entrance">
<app>
  <rdg wit="Q1 Q2 F">Enter Kent, </rdg>
</app>
<app>
  <rdg wit="Q1">Gloster, </rdg>
  <rdg wit="Q2">Glocester, </rdg>
  <rdg wit="F">Gloucester, </rdg>
</app>
<app>
  <rdg wit="Q1 Q2 F">and </rdg>
</app>
<app>
  <rdg wit="Q1 Q2">Bastard. </rdg>
  <rdg wit="F">Edmond. <lb n="2" ed="Q1 Q2 F"/></rdg>
</app>
</stage>
</p>
```

Fig. 15 An example of the same piece of text using TEI encoding.

Fig. 15 shows an example of some of the differences between the TEI encoding and my own XML tagset. Rather than using an ID to refer to each version, the tag `<rdg wit="">` is used. "In the parallel segmentation method, each segment of text on which there is variation is marked by an `<app>` element; each reading is given in a `<rdg>` element"¹⁶⁰ The TEI defines a

¹⁵⁹ TEI Consortium, eds., "19.2.3 The Parallel Segmentation Method." *TEI P4: Guidelines for Electronic Text Encoding and Interchange*. [Last modified 2004]. TEI Consortium. <http://www.tei-c.org/Guidelines/P4/html/TC.html> (accessed June 15, 2008).

¹⁶⁰ TEI Consortium, eds., "19.2.3 The Parallel Segmentation Method." *TEI P4: Guidelines for Electronic Text Encoding and Interchange*.

reading (or <rdg>) as “a single reading within a textual variation”¹⁶¹ Appendix 3.8 provides a list of the available TEI tags, including those I have amended for use in encoding Act I of *King Lear*.

¹⁶¹ TEI Consortium, eds., “12.1 The Apparatus Entry, Readings, and Witnesses.”, *TEI P5: Guidelines for Electronic Text Encoding and Interchange*. [Version 1.0.1] [Last modified February 3, 2008]. TEI Consortium. <http://www.tei-c.org/release/doc/tei-p5-doc/html/TC.html#TCAPLL> (accessed June 1, 2008).

8 Methodology

8.1 A Theoretical and Methodological Approach

In discussing the methodological approach of the research, it is important to consider the nature of the work, and the two domains between which it falls. In researching both the literary and technological aspects of the project it is clear that there is a distinct divide between methods and even in communications between these two domains. A discrete writing style for each area has necessitated a style specific to that of Humanities Computing. By combining elements of research and methodological style from both domains, it has been possible to work within the boundaries of each and contribute to the style of work that is applied in Humanities Computing.

By completing an initial “Brief Characterisation of User Groups”, it has been possible to identify the target user group(s), and produce a prototype edition of a Renaissance text catering to these users. By examining many opinions of editing, it has been possible to take a position amongst them with which to develop a new edition of a text. The production of an electronic edition has been approached with the view that no part of the text will be concealed or deleted. The text(s) have been appropriately presented and encoded to allow for maximum access to variants in the text, and to utilise these variants to re-create the text. Each individual version of the text has been presented in the most original form that is available, along with the facility to edit the text based on selection of available variants from those editions.

In addition to selecting the editing method by which the electronic edition would be created, it has been important to relate the tool back to the end user, by undertaking evaluation studies in order to improve and develop the tool. I undertook an initial investigation into the problems experienced by undergraduate students studying and editing multiple-version Early Modern texts. I began by attending an undergraduate English Studies seminar involving the teaching of the variant texts of *King Lear*. I was able to observe the undergraduates as they were asked to compare a quarto and a folio edition of Act I Scene I of *King Lear*.

Students were given two photocopied extracts from Act I Scene I which they then compared side-by-side using rulers and highlighter pens, and discussing the textual variants and their possible implications with the group. Attending this seminar enabled me to understand the sort of literary questions which might be asked of and by a student comparing texts, and the existing paper-based methods of comparing these texts.

I decided to hold a series of seminars during which the students would be asked to again compare several versions of a text, but using electronic copies on a computer screen as opposed to paper-based. In order to record the experiences of these students, I developed a questionnaire. This was designed to enable me to ask specific literary questions of the students (as had been done in the initial seminar I had attended), and to lead them through the application and gather feedback on how they had interacted with the text. In total I held seven seminars with English Studies students using the

prototype edition, and one observational study session with several students from Computing.

8.2 Data Gathering: Questionnaires

8.2.1 Questionnaire Objectives

Primarily the objective of the questionnaires was to gain feedback on prototype editions of the application, and to feed any suggestions back in to further developments of the tool. The questionnaire was used to accompany my observations and the video evidence of users interacting with the texts.

8.2.2 Sample Size

In total, seven seminar questionnaire sessions were held, and one observational study with questionnaires. Each of the seven seminars had an average of between eleven and twelve students in each class, and this was a usual attendance level of the scheduled English Studies seminars on those weeks. It was useful to have the results from a realistically-sized seminar group, in order to monitor how the prototype would be used in a real-life classroom situation.

Only two students were selected from Computing degrees to undergo observational students, as I felt it would be more useful for the prototype to be trialled by the target-users. Observations of the Computing students provided useful in gaining feedback on how the application could be understood by non-Literary Studies students, and in trialling the technology itself rather than the content.

8.2.3 Sample Type

The majority of respondents were undergraduate students, however one of the groups comprised the MA English Studies students, and, although many of them had previously been students on the BA, it was interesting to note their “advanced” responses to the questionnaire.

8.2.4 Questionnaire Design

I designed several versions of a questionnaire which were each used in a different set of observed trials. In early investigations, questionnaires were limited to three pages and related only to one of the prototype editions. As I examined the feedback from these trials I was able to redefine the questions, and extended the questionnaire to five pages, encompassing several different prototype editions.

I divided questionnaires into five sections:

- (i) Introduction/ Getting Started
- (ii) Familiarization/ Getting to know the application
- (iii) Literary Questions and Tasks (“Frames” edition)
- (iv) Literary Questions and Tasks (Other editions)
- (v) Application Questions and Tasks (“Frames” edition)

The questionnaire included an introductory section at the beginning allowed me to explain briefly the purpose of the study, and to provide a summary of the tasks the user would be expected to be asked to complete. I also

informed the students that the questionnaires would be anonymous, and that there were no right or wrong answers, so they would not be assessed on their responses.

The way in which a data-collection method such as an observed questionnaire session is set up can have an impact on the data that is collected.

The context in which respondents are asked to answer questions does not just affect their willingness to respond; it also can alter the responses, and so it is an aspect of the validity of the data-collection method... The respondent will react to his or her perceptions of the nature of the questions and to the characteristics of the interviewer.¹⁶²

For example, results may depend on how much of an overview of the research area is presented before the questionnaire begins, and how much the presence of the interviewer/researcher will influence the respondents.

8.2.5 Questionnaire Issues

Before undertaking the studies, I ensured that the Research Ethics Committee were consulted. Each respondent of the questionnaire was provided with an information sheet detailing the contents and expected outcomes of the study, as well as a consent form to sign agreeing to be filmed for the purposes of the study. See Appendix 2.1 and 2.2.

¹⁶² Michael Wilson and Roger Sapsford, "Asking Questions", *Data Collection and Analysis*, 2nd ed., ed. Roger Sapsford and Victor Jupp (London: SAGE Publications, 2006), 118.

8.3 Data Gathering: The use of video recording

I was able to make digital video recordings of several of the seminar sessions, filming the students at the computers and observing their use of the application, and their discussions about the poem.

8.4 Designing trials of the prototype

In planning an outline for the user trial experiments I had to design a questionnaire for each person to complete. I also sketched a plan for the expected outcomes of the testing, for both the students and for myself as the developer:

(i) Introduction

Students are introduced to one version of the poem, they begin by discussing the poem's meaning with the tutor – this might even have occurred during a previous seminar. The tutor introduces the application and asks the students to work in pairs, analyzing the eight editions of the text in terms of how they are different from each other. Questionnaire questions/ specific tasks are completed by the student. Although working in pairs, students are asked to work individually on some tasks, and in pairs on others. Task answers are to be written on the question sheets provided, and submitted to the tutor at the end of the session.

(ii) The Aims of the Experiment

By the end of the session the student will be able to analyze and evaluate different editorial practices through their experience with examining multiple texts. In using an electronic tool for examining textual variants, the students will become more familiar with taking an interactive approach to editing and examining texts.

(iii) Environment

A regular undergraduate English Studies seminar will be conducted in the computer labs on campus. Up to 20 students on 14 computers can be accommodated.

(iv) Aims and Goal(s) of the User

The goal of the user should be to understand the task that has been set, to complete the questionnaire, to gain a greater understanding of the problems of editing multiple texts, and to think about the best way to display and interact with these texts.

(v) Predicting the alternative likely outcomes

Positive outcomes:

The student will be able to describe different editions of a poem in terms of the editorial practices used in their reproduction.

The student will be able to describe and analyze variant readings.

The student will be able to distinguish between substantive and accidental variants in the text of an early modern poem.

Negative outcomes:

A Student or students is confused by either the task or the interface.

The student finds a bug in the application which hinders their experience.

The student becomes distracted and abandons the application.

The student responses to the questionnaire are incomplete and unhelpful.

The questionnaire is inadequately designed to extract useful feedback (is unhelpful in making revisions of the application).

(vi) Questions and Tasks: Interface features

Specific directed tasks will be set, in addition to general questions requiring non-specific feedback. An example of a specific question could be: How easy did you find it to identify that a word was from a different version? e.g. that the spelling of the word "They" was from the Unmodernized version of the poem?

(vii) Questions and Tasks: Scholarly literary tasks

General tasks:

The tutor introduces the poem using the University of Toronto version (Version 3). Students discuss the poem's meaning and how this could be affected by editing.

The tutor introduces the questionnaire tasks, and asks the students to work in pairs analyzing the eight texts in terms of how they are different from each other.

Specific literary tasks:

Is there a numerical connection between the contents of the poem "They Flee From Me" and its length. For example, there is mention of twenty-one and the poem is twenty-one lines long.

Students work in pairs with a questionnaire each, but can work alone on some aspects such as composing their own edition of the poem. Questions which much require discussion between two or more students might be: what is the most contentious variant? What kind of variants might there be? Are there any variants which people have disregarded? How many variants can you find?

(viii) Questions and Tasks: "Editing-like" tasks

General tasks:

The concepts of "substantive" and "accidental" variants are introduced.

Students are asked to consider relative merits of a) some substantive variants, b) the overall editorial issue - should we modernize accidentals?

Specific literary tasks:

Students must decide which is the most significant variant – how does its selection change the meaning of the text?

The student is asked to find the line in the poem which they think contains the most significant variant(s) between the versions and why? (i.e. the variant (s) changes the meaning of the line or poem as a whole).

(ix) Findings/ Amendments

Students wanting a shortcut to view a specific version in one click on the LHS poem, at the moment this task is tedious to undertake as it involves cycling through each choicepoint in the poem, through every variant until the user reaches the required complete text.

A simple override control could be designed that forces the whole poem to automatically cycle to Version 3 for example.

8.5 Observational Studies

In addition to the seminars with the English Studies students, I also undertook several observational studies using a similar set of guiding questions, but observing students from a Computing degree. As each student worked through the questionnaire, I was able to observe how extensively they were interacting with the prototype, and the levels of difficulty with which they completed the tasks.

8.5 Problems Faced During Development

One of the most significant problems I have encountered whilst working on the project, has been in encoding “line endings” – by this I mean, when working on the 8 available versions of the poem “They Flee From Me” – each line of the twenty-one lines of the poem ends in the same place – for example, the last word or words of line six might have a different spelling, or slightly different meaning, but the line has to end in the same place in all editions of the poem, in order to complete the rhyme scheme. Not so with the play, as it may not necessarily be written in verse at all, or alternatively, the verse may have changed in that editions – leaving the stresses on different words, or including more words

Line 4

Q1: I Thought the King had more affected the Duke of Al-

Q2: I Thought the King had more affected the Duke of

F: I Thought the King had more affected the

Line 5

Q1: bany then Cornwell.

Q2: Albeney then Cornewall.

F: Duke of Albany then Cornwall.

Fig. 16 Line endings in all three versions

For example, as you can see in Fig. 16, *King Lear* Act I Scene I, line 4 – none of the editions end in the same place, which creates a problem with display –

as I have chosen to display (and encode) the text on a single word basis as opposed to a series of words grouped together.

For example, “Duke of” in F is not really a variant visually, as it is still spelt the same way as in the other two editions, so if I were clicking through as in the “They Flee From Me” example it would appear as if there were no difference between the editions. It is only by the placing of the words Duke of being moved to line 5 in the folio, they readers can view the difference – still a variant, but not a significant one in terms of users producing their own version of the play by selecting variants.

Additional problems encountered include: having the same piece of speech spoken by a different character in alternate editions – e.g. in Line 204 of the quartos, the line is spoken by Gloucester, but in 204 of the folio, it is Cordelia who takes the line – I had some difficulty with the TEI encoding, being able to incorporate this feature – in the end, I came up with simply using the <sp> tag twice, rather than being able to find a way to combine the two characters in one tag, in a scenario such as “in Q1 and 2 it’s so an so, and in F it’s so and so”. I also made the decision to add a “dual character” to the dramatis personae, for example `<role ID="gon/reg">Gonorill or Regan</role>` to show that either Gonorill or Regan takes the line, depending in which edition you are reading it.

8.6 Initial Project Research

From the start of the project I was made aware of the interdisciplinary nature of subject - Computing and Literature. The emphasis has been on technology supporting literary studies, so I began to consider how technology was being used in other projects to support the goals of digitizing Humanities. My supervisory team has been comprised of academics from both literary studies, and from computing and communication studies, and from the outset I found it useful to define a glossary to facilitate understanding between the domains and departments.

8.6.1 A Pre-development Review of Supporting Technologies

Before setting out to develop an electronic edition, I completed an assessment of some of the technologies which could be used to support the application, and some of the considerations of using these.

The nature of client-server interaction involves maintaining a basic copy of an application on a server, and providing that application over the Internet to the client machine. Any alterations to the textual variants are then made locally, and do not affect the "original" copy of the website material. XML, XSL and HTML are all front-end technologies used for encoding and also for display purposes. XML preserves content, and XSL separates style from content.

Methods for display and levels of interactivity could include monitoring the number of alterations made by the user, to see if they have understood the task they have been set (e.g. to make their own meaning from the piece by

editing). A facility such as making the variants cycle through the different combinations at different speeds could increase the levels of interactivity, and the attention span of the user.

JavaScript could be used to produce a number of different interfaces, creating a facility for interactivity without producing a cluttered interface. One or two methods of interactivity should be selected, and a level of consistency adhered to, so as not to confuse the user with variations in both content and style. The use of "choicepoints" - blank nodes to highlight the spaces for variants in the text, this would allow the user/ reader to identify where in the text a variant exists. Colour could be utilized to highlight different variants, enabling the user to perform new tasks involving marking the text and making comparisons of sentences and variants.

Selecting XML as an encoding language enables the encoding of hypertext documents using rules from HTML, but adding additional tags to be transformed by the XSL document. XSL transforms the appearance of the XML document based on what is contained in the style sheet. JavaScript allows for greater interactivity for browsers in which it can be enabled, such as Internet Explorer.

It would be possible to incorporate the use of a database within the application to provide a stable backup of the initial material on the website, however as the files would not be able to be altered by the user, the data would be protected on the server machine. It could also be feasible to include

a search facility within the application to enable easy and fast access to parts of the application, for example key words, however it is only after user-testing that the user requirements for the application can be gathered.

In addition to the texts themselves being comprised of versions, the application would exist in a number of states of development. Version Control would therefore be an important aspect to monitor to ensure consistency in design. With reference to the stability of the application, a consistent version of the application should be available online at all times, and backup copies and all previous versions in development, retained.

Other aspects to consider could be a facility to print, which could be useful in a teacher/ student scenario for submitting work. The length of the text on the screen – the poem “They Flee From Me” is twenty-one lines long, compared with the entire text of a play such as *King Lear*.

9 Analysis and Critical Evaluation

9.1 Testing the Prototype

9.1.1 Observing use of the text

During the trialling period, I was fortunate to have observed the way groups of readers view and edit multiple-version texts for different purposes. For the purpose of understanding the content of the text, readers appear to favour the ability to “see” the material, as opposed to having it hidden from them – to view whole copies each edition. When readers were asked to examine the texts from an editorial perspective, they favoured the ability to select variants from a pool of available words, and in effect to produce their own edition of the material. Interactivity then appears to have a role to play when students are examining multiple-version texts from a historical point of view.

The option to engage with the text by actively changing it (with some restraints in the technology of course) enables readers to experience some involvement with the text on a personal level. In a paper-based environment readers annotate, underline, cross out and highlight, actively moving the text around and make personal editing choices in order to aid their understanding of the material. There is no reason why elements from these experiences could not be emulated in the electronic domain – the advantage being that we can animate the text and offer choices on how the text can be manipulated, viewed, and even re-edited.

9.1.2 Target Audience Testing

One of the most interesting elements of the work has been observing the use of the application amongst the target users – first year undergraduate students of English Literature. The BA English Studies degree at Sheffield Hallam offers a combination of study areas including literature, language and creative writing. One of the core units of the degree is the module: “Introduction to Poetry 1550-1750” – it was the students of this module who were given the application to test in conjunction with their taught seminar.

9.1.3 The Testing Environment

Each of the trials was held in a computer lab with which the students were familiar, their regular seminar classroom being in the same or a very similar building within Cultural Studies. The main difference between the two rooms was of course the computers, and that students were sitting and working in pairs to answer the questionnaire, as opposed to working individually in a regular seminar situation. There was also less group discussion with the tutor during the questionnaire sessions, as students were sitting facing their monitors, rather than facing the lecturer at the front of the room. The majority of students appeared to be quite comfortable with the environment, and did not appear excessively distressed by the combining of computers with their previously paper-based seminars.

9.2 Test Evaluation (Prototype)

9.2.1 Evaluative Phase (Prototype)

“Before embarking on a usability evaluation it is important to be clear as to what the purpose of the evaluation is...”¹⁶³ In the following cases, the purpose of the evaluation of prototype use was to produce an initial set of user results giving feedback on various elements of the application. The prototype was intended as a probe, to investigate responses to the concept of the application, which would then enable amendments to be made, and further evaluation completed.

9.2.2 Different User Groups and Trial Scenarios

Evaluation was undertaken on three separate user groups.

- i) Initial trials involved students from outside of the target domain; those from Computer Science. Several students from a Computing degree were asked to complete the questions/ tasks. These students had not read the poem “They Flee From Me”, and were relatively unfamiliar with concepts in English Studies. These students were working through the questions in order through to the end, without external interference.
- ii) Secondary trials were completed with a group of first year English Studies students (the target user group). This trial was undertaken within a formal literary seminar session, which involving teaching of the

¹⁶³ Patrick W. Jordan, *An Introduction to Usability* (London & Philadelphia: Taylor and Francis, 1998), 81.

text “They Flee From Me”, so that students were already familiar with the text with which the application engages, and also, with general concepts in the study of literature. These students were completing sections of the questionnaire that tied in with the themes of the formal poetry seminar. Students were not working through the questions without interruption.

- ii) Additional trials have been undertaken on the target user group of English Studies students. Two seminar sessions were set up to allow trials of the application on users who had not previously encountered the poem, and for whom the process of examining multiple versions of a specific text was a relatively new experience. These users were familiar with general concepts in the study of literature, and were working through the questions without interruption.

The questionnaire questions/ tasks were approached in very different ways by the participants, demonstrating the varying ways that students read with regard to answering a specific question, finding a specific piece of information, or completing a specific task. The use of different user groups with differing levels of knowledge makes for a more significant learning opportunity.

9.2.3 Evaluation Techniques

Several techniques were employed when preparing for this period of evaluation. These included: i) the use of a questionnaire; ii) field observation; and iii) logging user interactions.

i) Questionnaire Design

In designing the questionnaire, three separate categories were chosen to be included: 1) A Familiarisation or “Training” Section; 2) Literary/Scholarly Tasks, and 3) Interface Issues. The familiarisation section allowed users to become acquainted with the application and “trained” them to be able to complete specific tasks that were referred to again in more detail further into the questionnaire. In using the questionnaire format, data could be gathered about specific elements of the application as well as user views on the application as a whole.

ii) Field Observation

By observing users in the environment in which they would usually use an application such as this, any outcome is generally more authentic than if the subject had been analysed interacting with the application in a foreign environment. It is important to make use of field observation early in the design stage of the application, with the aim of increasing understanding about what users do naturally¹⁶⁴ and how they interact with objects, people and situations in the field.

¹⁶⁴ Preece et al., *Interaction Design*, 342.

iii) Logging User Interaction

By using a simple piece of JavaScript code, it has been possible to log user interactions with the application, by having a timer and recording the number of mouse clicks by the user in a specified time frame (for example every ten minutes). This demonstrated approximately how much time users were spending on specific tasks or questions. Although this was a basic level of experimentation with logging, it has encouraged ideas about where logging user interactions could prove useful in future evaluative sessions. Preece et al¹⁶⁵ suggests that an advantage of logging user activity is that it is unobtrusive, but that also by informing users that their interactions are being logged might in turn influence their behaviour, and therefore any outcomes of the logging.¹⁶⁶

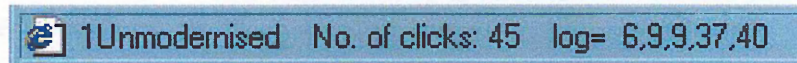


Fig. 17 An example of data logging information on the status bar

The illustration in Fig. 17 shows where the data appears on the status bar. Firstly there is the version of the poem that the user has most recently positioned the mouse over, then there is the total number of mouse clicks the user has made, followed by the number of mouse clicks made in each timed period of ten minutes (up to a total of 50 minutes).

¹⁶⁵ Ibid., 342.
¹⁶⁶ Ibid., 378.

Fig. 17 shows that in this case the mouse was clicked 6 times during the first ten minutes, then 3 more times in the second ten minutes, then not at all in the third ten minutes, and so on. These example results indicate that the user did not interact with the application very much during the “Familiarisation” section of the questionnaire, which incorporated reading time, but interacted most during the “Literary Questions/ Tasks”, and “Application Questions/ Tasks” sections, which required the user to compose onscreen.

Fig. 18 visually presents the findings of the first group of students (Group A) in terms of their measurable levels of interactivity with the screen. Initially there is a clear increase in interactivity as users begin to familiarize themselves with what is onscreen. At approximately 15 minutes, users again increase their level of interactivity, and at 25 minutes, the majority of users reduce their number of mouse clicks again. Only one student continued beyond the time the others have ended their onscreen session.

Although the logging process primarily provides quantitative results, when used in conjunction with observed studies of users, it has been possible to interpret statistics qualitatively.

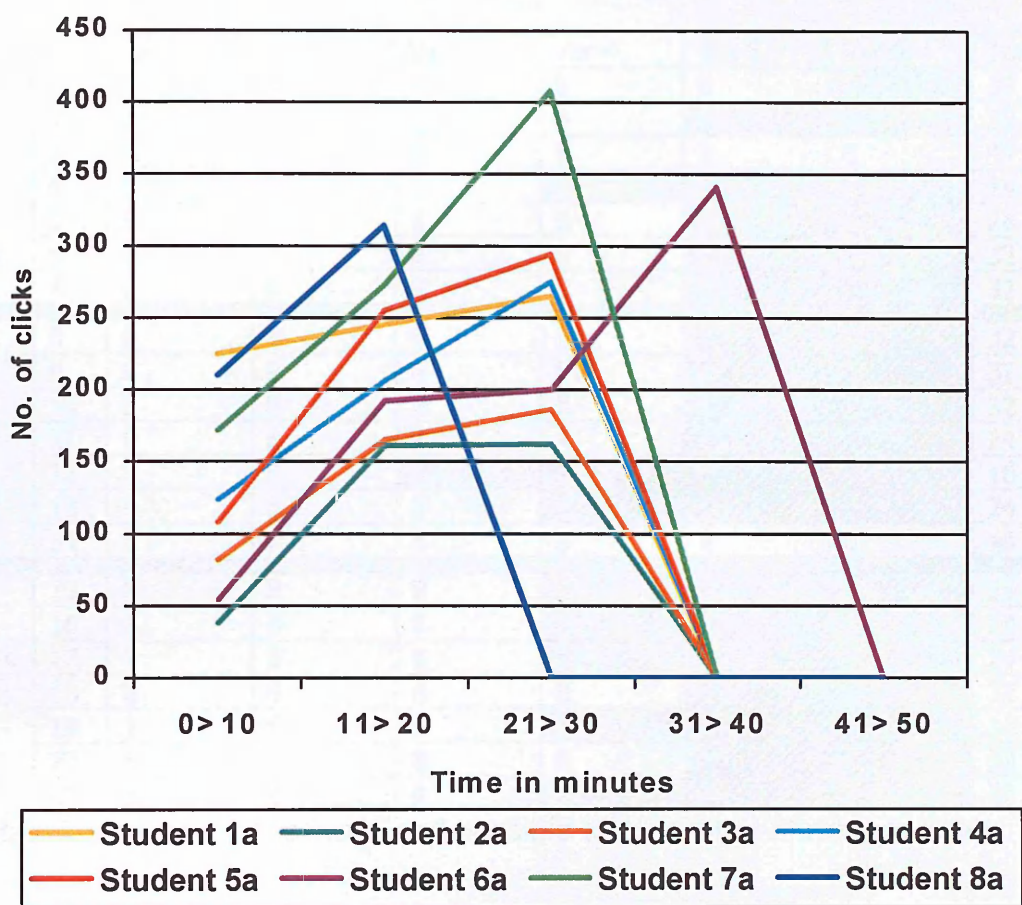


Fig. 18 Mouse click interactions recorded with Group A

Table 1 (below) gives a numerical indication of the levels of interactivity that are possible if all variants are revealed. In order to observe how much interaction was achieved by the user, I calculated the maximum number of clickable choices (variant words) from each edition, and the maximum number of mouse clicks it would take for the user to cycle through every variant word in each stanza of the poem.

		Var 1	Var 2	Var 3	Var 4	Var 5	Var 6	Total
Stanza 1 Lines	1	8	8	6	8	8		38
	2	8	8	8	8			32
	3	8	8	8	8	7	8	47
	4	8	8	8				24
	5	8	4	8	8			28
	6	8	8	8	8			32
	7	8	8	8	8			32
Stanza 2 Lines	8	8	8	8	8			32
	9	8	8	8	8			32
	10	8	8	8	8			32
	11	8	8	4	4			24
	12	8	8					16
	13	8	8	8				24
	14	8	8	8	8	8	6	46
Stanza 3 Lines	15	8	8	8				24
	16	8	8	8				24
	17	8	8	8				24
	18	8	8	8	8			32
	19	2	8	8				18
	20	8	8	8	8			32
	21	8	4	8				20

Table 1 Total textual variants and possible total number of mouse clicks

Table 1 shows for example that the user can click eight times in total on the first choicepoint in line 1 stanza 1 of the poem to cycle through variants from each of the editions. An additional mouse click returns the user to the initial status of the question mark. The numbers Var 1-6 across the top of the table indicate that there are between one and six choicepoints on each line of the poem, some of the cells in the table do not have entries as not all lines have as many as six choicepoints.

From this table, the total number of possible variants can be calculated. There are 80 choicepoints, and 693 clickable variants, this is the basic figure students would achieve if they were to cycle through every single variant on

the page, but does not allow for repeated clicks or for the additional click taken to return to the initial question mark state.

9.3 Questionnaire Findings and Analysis

Each questionnaire provides an introduction to the purpose of the study, and gives instructions on how to access the application. The first section includes some general questions to allow the respondent to provide some non-academic or technical answers before beginning the trial.

As the trials were comprised of almost entirely English Literature students, I decided it would be useful to know how long they had each been using a computer, and also, how long they had been using the World Wide Web. This information gives a basic indication of the level of technical familiarity amongst the users, and the difficulty level with which they might approach an electronic edition.

Section 1 : Familiarization

Q1a: How long have you been using a computer?

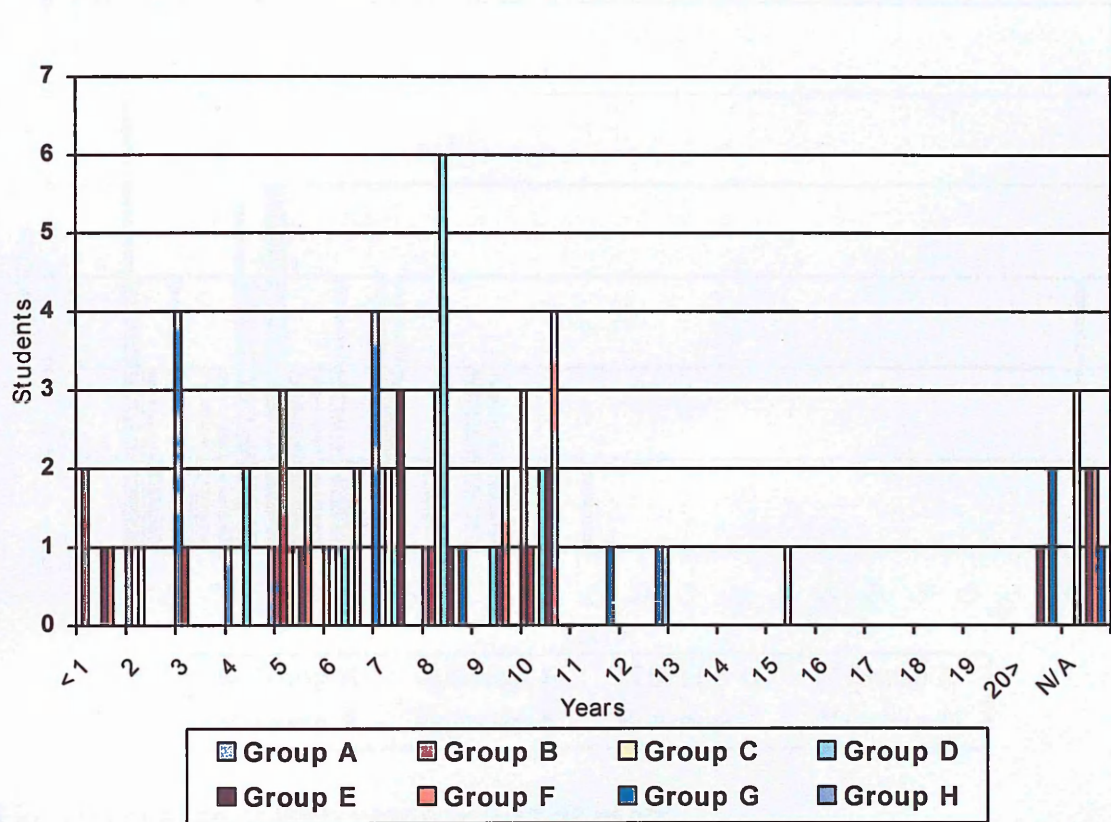


Fig. 19 Duration of computer usage across all users

Fig. 19 shows that the majority of the students had been using computers between one and ten years, giving them sufficient time to be familiar with at least basic computer-skills. The N/A category on the horizontal axis refers to respondents whose replies were either incomplete, or not of numerical value, some of which indicated they had been using a computer since “secondary school” or “since a young age”.

Q1b: How long have you been using the World Wide Web?

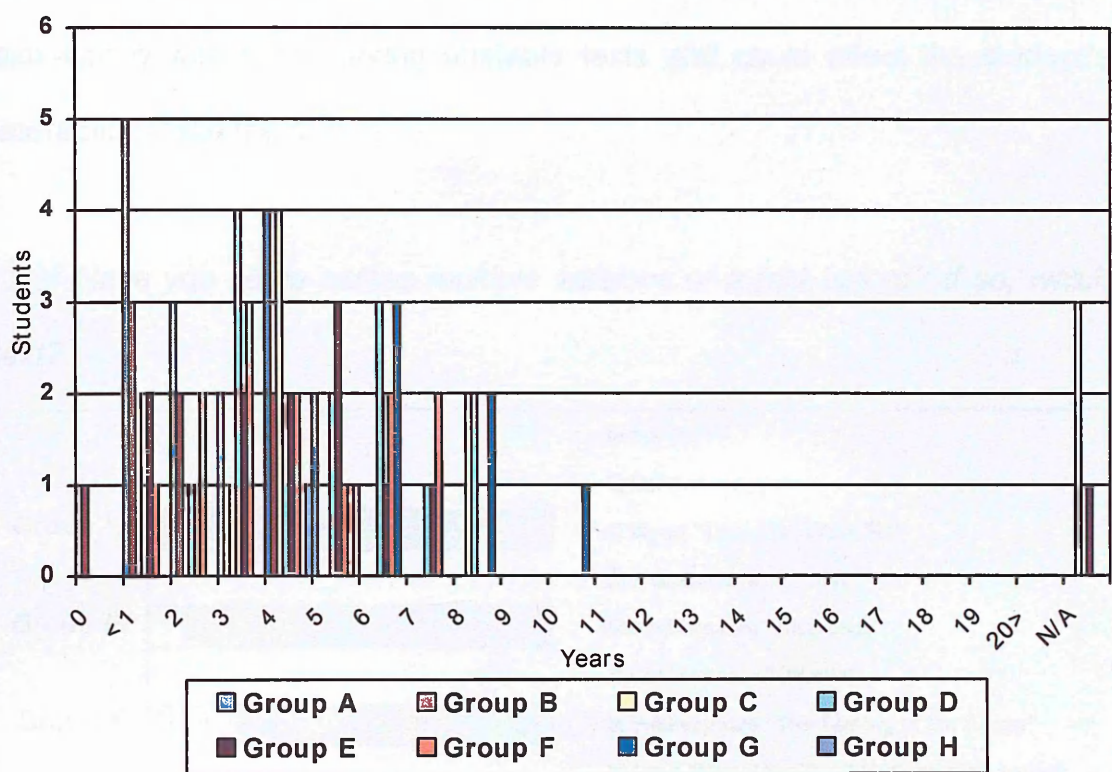


Fig. 20 Duration of Web usage across all users

As the prototype application is accessible via a webpage, it was useful to note how experienced the Literature students were with using the World Wide Web. The majority of users had been using the Web for between one and eight years, and appeared to display little difficulty with operating a browser interface. The questionnaire however did not ask users which browsers they were familiar with, or indeed whether they were Macintosh or PC users. The default browser on the University PCs, including the lab in which the studies were undertaken, is Microsoft Internet Explorer (IE). The application has been designed to be viewed using IE, so the students might be more familiar with this browser if they had previously been using the machines at University.

I also found it useful to ask the students about their awareness of multiple-version texts prior to the session, as this would indicate some prior-experience with encountering unstable texts and could affect the student's interactions with the prototype.

Q1c: Have you come across multiple versions of a text before? If so, which text?

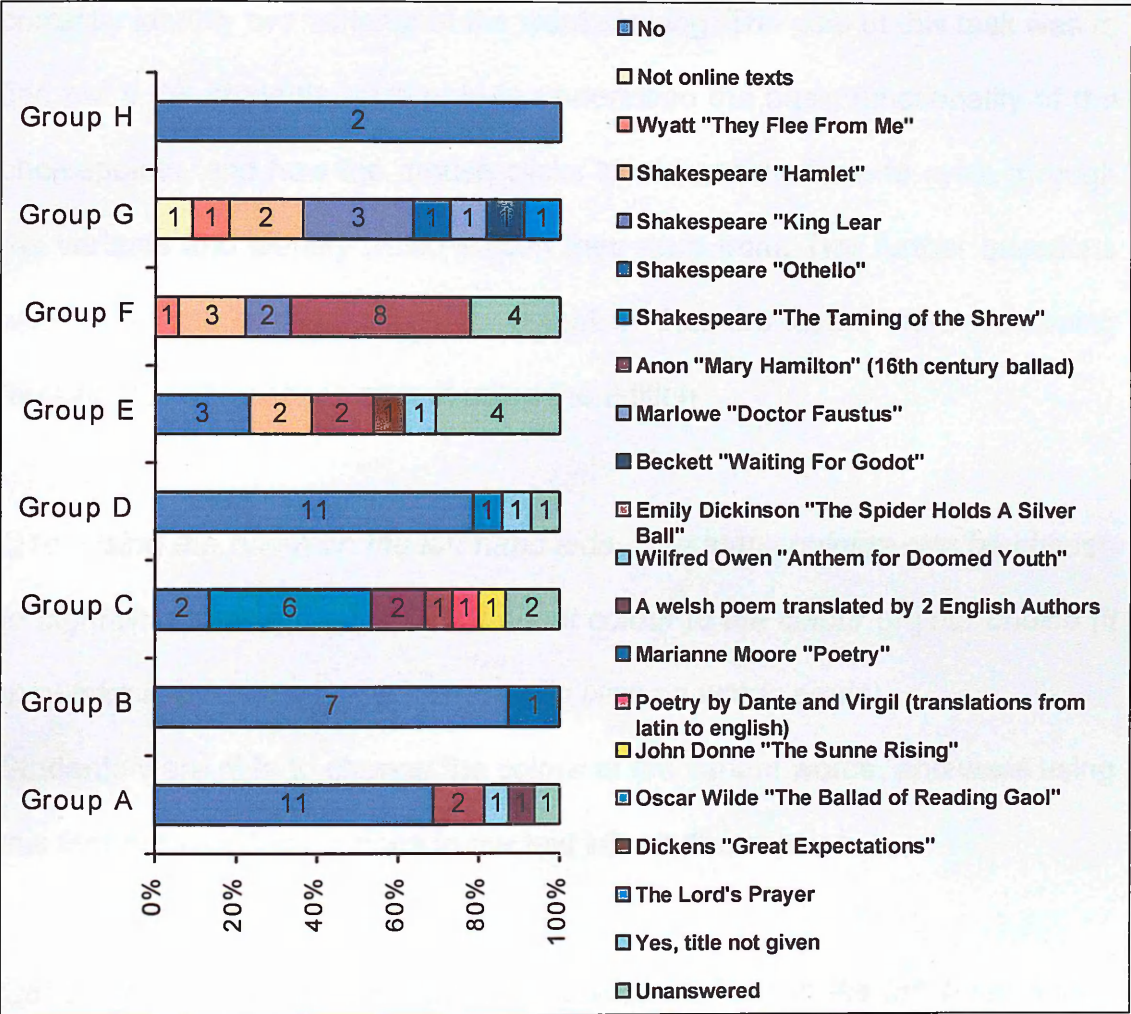


Fig. 21 Student's prior experiences encountering multiple-text editions

Q1d: Start by clicking on the question marks in yellow (“choicepoints”) in the left hand poem. How many variants of the word “stalking” can you find around all eight versions? (You can also check this on the right hand side where you can see the whole of each version at once. Just click on a number and it will take you to the number of the version you want.)

All users across the groups who attempted this question were able to correctly identify two variants of the word stalking. The goal of this task was to find out if the students were able to understand the basic functionality of the choicepoints, and how the mouse-clicks would enable them to cycle through the variants and identify which edition they were from. Two further questions were included in this section to establish that the users were becoming familiar with the mechanisms of using the edition.

Q1e: Using the poem on the left hand side, how many colours can be chosen to highlight the variants? Set the variant colour to the colour of your choice (it may take a few seconds before you can click on words again).

Students were able to change the colour of the variant words, and were using this facility to mark their place in the text later in the session.

Q6: Starting at the “choicepoint” (the Question Mark) in the left hand poem, how many version have the words “vnkyndly so” in?

In the first revision of the questionnaire (see Appendix 2.3) which was used from Group B onwards, a final question has been added to the initial Familiarization section which includes information about user interactivity:

Q1f: Find the “Status Bar” of your browser window; this is in the bottom left-hand corner of your computer screen or window and might look something like this: (screenshot of browser status bar).

This question was intended as a training exercise to familiarize users with the status bar before completing another task at the end of the questionnaire. The number of mouse-clicks was displayed in the status bar of the browser, and the students were provided with a screenshot to direct them to the correct place to view this onscreen. They were asked to make a note on the questionnaire of the number of clicks in each period of ten minutes (up to a maximum of fifty minutes), in order to show how much they were interacting with the application throughout the course of the session. The limitation of using this particular method is that only the variants in the left-hand text have interactive choicepoints, therefore it was not possible to tell if the users were clicking elsewhere in the edition, for example using the text on the right-hand side.

9.4 Results and Findings (1): Observational Study

9.4.1 Findings

During the evaluative phase, it was important to note exactly how users were interacting with the text(s). Readers seemed to favour the ability to look at whole copies of the text, rather than utilising the interactive nature of the “Combined Version” of the poem. Although they did find the highlighting feature a useful tool in comparing variants, many said that they would have

preferred to be able to use this tool in both the “Combined” (RHS) and “Individual” (LHS) versions of the text.

The outcomes of the evaluative phase and observational study have been recorded in both a technical report and graphical representations of user interactions logs, one of which can be seen in the chart in Fig. 18. The most significant issues to arise included those of screen resolution and the size of fonts causing lines in the poem to wrap-around, in addition to readers being unable to view two full versions of the poem onscreen at once. The urge to print out the material (as is often a symptom of reading excessive text onscreen) appeared to be suppressed by the fact that the poem was only twenty-one lines in length, and therefore fitted on the screen in its entirety.

9.4.2 User Interaction Analysis and Evaluation Findings

By analysing the findings of the observational studies, and examining the ways in which students were interacting with the application, it has been possible to begin theoretically refining the model of the prototype. With reference to models such as the ERMIA¹⁶⁷ model, I have been looking at ways of modelling and analysing user interaction. For example, when observing users of the prototype application, it was noted that instead of using the application as a tool for completing the set tasks, they had pasted the text(s) into a Microsoft Word document.

¹⁶⁷ Thomas R. G. Green and David Benyon, “The Skull Beneath the Skin: Entity-Relationship Models of Information Artefacts”, *International Journal of Human-Computer Studies* 44 (6) (1996): 801-828.

9.5 Results and Findings (2): English Studies Student Trials

A user creates a model in their mind of how they would like to be able to complete a task(s) (for example, the actions or stages required to make a cup of tea). These actions or stages are not always in the same order for every user (some people might put the milk in first and then pour the tea, and others would add the milk afterwards). In the case of testing the application, these mental models can be seen to be at work in anomalies of use of the application – how the users make their own best way through the questions and tasks.

I was given permission by some of the student groups to film them using the application so as to be able to record their interactions with not only the application itself, but also the dialogues that they had with each other whilst at the computers. Across all the testing sessions I have undertaken there has been one common occurrence – users always want to find their own way of doing things, and computing applications do not always allow for this.

I have presented my findings at several Humanities Computing conferences, my first discovery being that some users preferred to be able to view whole copies of the texts side-by-side. To overcome this apparent hurdle in the application a few of the students had minimized the application window and were pasting two copies of the text into Microsoft Word, so that they could compare them side-by-side rather than cycling through the variants in the application. I noticed that this was a trend that continued into future testing

sessions, and seemed to be exacerbated by whisperings between the students that “this is the easiest way to do it”.

Undergraduate students appear to have a different way of working than that of the staff or postgraduates – they just seemed to want to get the answer right and move on as quickly as possible. They were less interested in following guidelines, and if they could find a quicker/easier way of answer the questions, then they would.

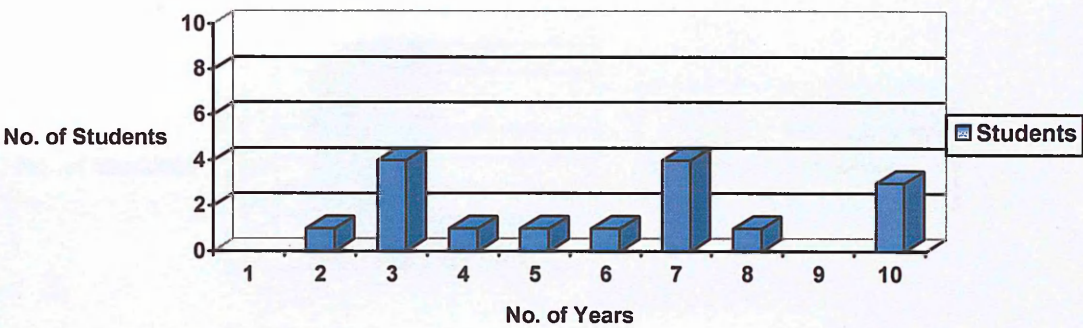
I think perhaps the higher education system has to take some of the blame for this, as there is immense pressure sometimes on undergraduate students to “achieve” rather than necessarily to “understand”. However, as students did appear to be interested in the use of the computer during the English class, the application proved a novel distraction from usually predominantly paper-based classes.

9.5.1 Results: Group A

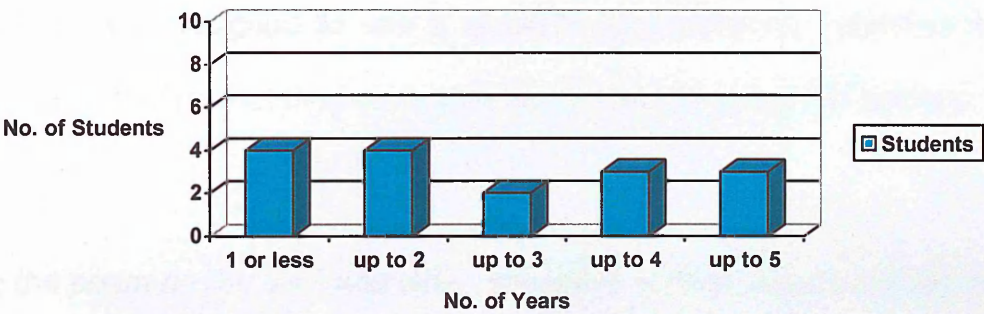
Taking Group A as a representative sample of the user trials, I have tabulated some of the results from this first questionnaire session below. There were a total of 16 students in Group A (two students to a machine, plus two single students using individual machines).

SECTION 1: Familiarization

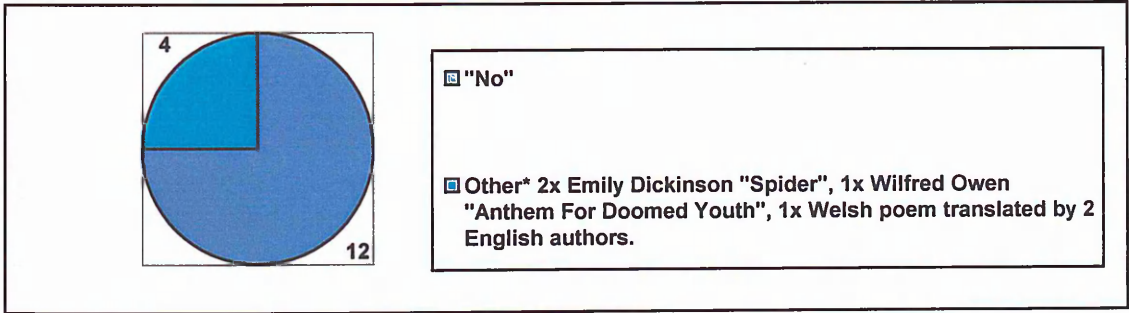
A) *How long have you been using a computer?*



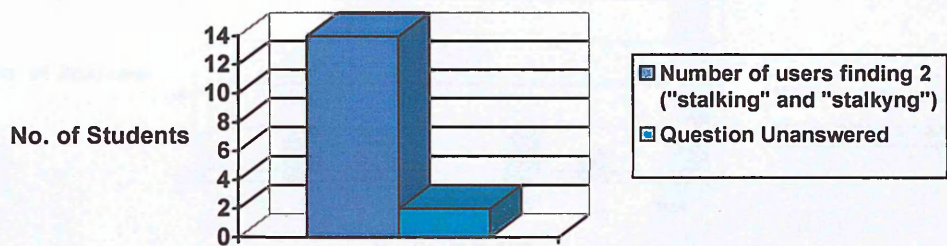
B) *How long have you been using the World Wide Web?*



C) *Have you come across multiple versions of a text before? If so, which text?*



D) *How many variants of the word “stalking” can you find around all eight versions?*

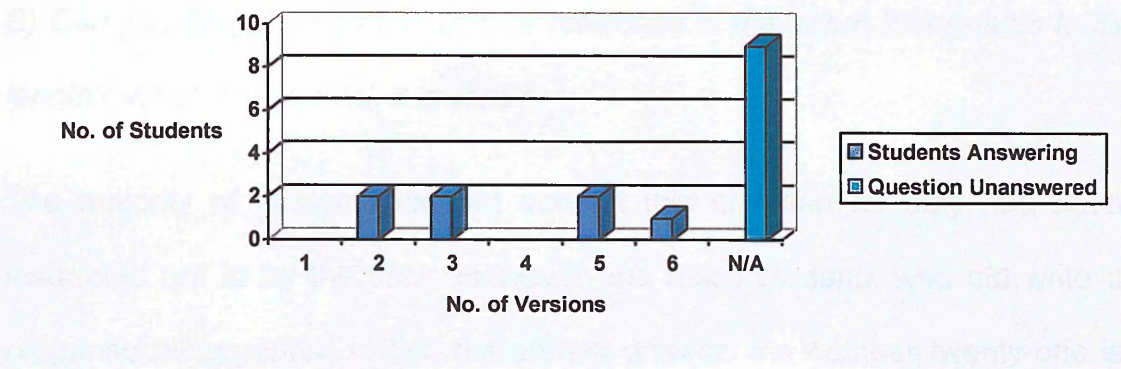


The majority of students were able to complete this task, only two leaving the question unanswered (which may have been due to a number of factors). This question was designed to see if students had identified subtleties of spelling, and to confirm that they were able to navigate between the editions.

E) *Using the poem on the left hand side, how many colours can be chosen to highlight the variants?*

This was a simple familiarizing task in which 100% of students found the correct answer that there are four colours.

F) Starting at the “choicepoint” (the Question Mark) in the left hand poem, how many versions have the words “vnkyndly so” in?



This question was quite similar to D), in that it was intended to test the user’s ability to navigate the edition and to notice differences in spelling. However, the majority of students do not seem to have answered this question, and those who have, appear to have come to a variety of different conclusions. This could be due to a number of factors but could also be due to the ambiguous wording of the question, for example if the student had not observed the subtleties of spelling – “vnkyndly” could be mistaken for “unkindly”. The correct answer should have been that there are two versions which contain the words “vnkyndly so”.

SECTION 2: Literary Questions/ Tasks

A) How many variants can you find between the last 5 lines of Version 3 and the last 5 lines of Version 7?

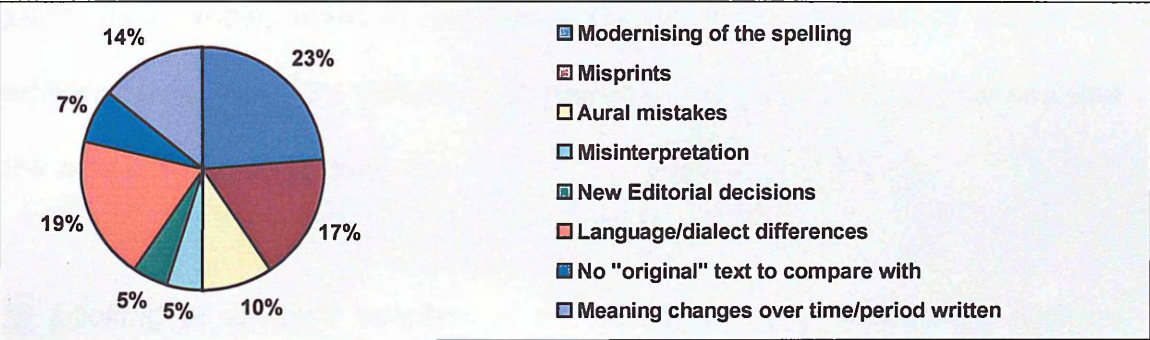
This question was altered orally by the tutor in the seminar, and the results have not been presented specifically as the tutor asked different tasks of different groups of students. For example, students were split into 3 groups,

and each group was asked to look at a different stanza of the poem and compare it in each version of the poem.

B) Can you find any numeric clue or reference in the poem that relates to its length? What do you think it means?

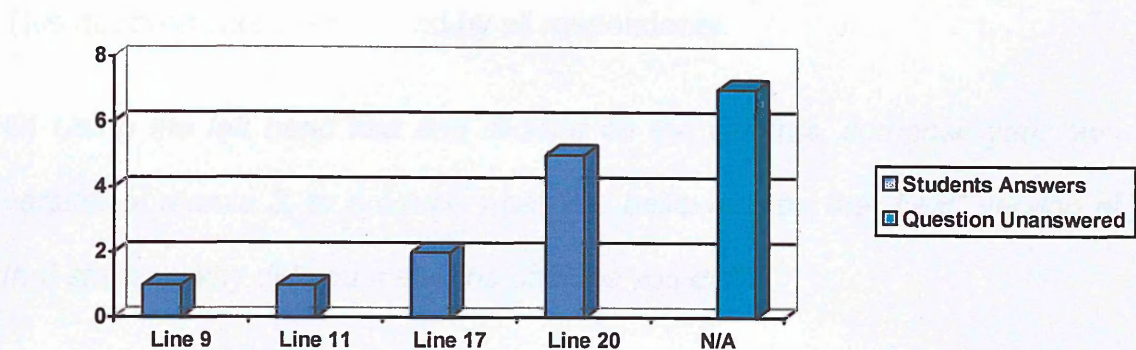
The majority of students did not attempt this question as they had been instructed not to by the tutor. However, the (four) students who did write a response all appeared to find the correct answer: the number twenty-one is mentioned in stanza two, and there are twenty-one lines in total in the poem.

C) Can you think of any reasons why one version of the text might be different from another? Give as many as you can.



Students provided a number of suggestions as to why the eight texts might differ from each other. This demonstrated a depth of user knowledge of many of the editorial issues, and was designed to give grounding for the student to continue with the literary tasks.

D) Find the line in the poem that you think has the most significant or contentious variant between versions and why that is? (i.e. the variant changes the meaning of the line or poem as a whole).



The student who has chosen Line 11 as the most significant line was as a result of word wrapping of the “Individual” text in the application. The student identified the word wrapping line in the application as being significant to the poem as a whole, when in fact this is not an original feature of any of the editions. It is important therefore to consider the word wrapping facility and the size of fonts in general.

E) Looking at all eight versions of the poem, can you identify any general similarities between some editions but not others? What do you think they are?

Similar Editions:	Number of Students:
Question Unanswered	12
Versions 1 & 4	1
Versions 2 & 8	3

F) What do you think are the most significant substantive variant(s) between Version 3 and the other versions of the poem? Why do you think that?

This question was unanswered by all respondents.

G) Using the left hand text and clicking on the variants, compose your own version of stanza 3, to produce what you believe to be the “best” version of that stanza. Why did you make the choices you did?

This question was unanswered by all respondents in Group A.

SECTION 3: Application Questions/ Tasks

Only eight students attempted questions in this section, however this may have been due to the students working in pairs and only answering on one of the questionnaire sheets.

A) What aspect(s) of the application did you find most helpful to you in completing the tasks and why?

- *The ? to click on*
- *[unanswered]*
- *The coloured scrolling variants made it far easier to compare versions and to see how individual words can shape meaning.*
- *[unanswered]*
- *[unanswered]*
- *I found the right hand poem the most helpful in distinguishing the different variants throughout the different versions of the poem.*
- *[unanswered]*
- *Looking at the different poem versions and comparing them to each other.*

B) What aspect(s) of the application did you find most unhelpful to you in completing the tasks and why?

- *You can't see the whole poem at once*
- *Having to click between each of the eight versions slowed down the whole activity.*
- *Hard to see differences when you can't see all version at once.*
- *Couldn't have two variations on screen at the same time, so making it difficult to compare.*
- *Couldn't see more than one version at a time.*
- *[unanswered]*
- *Combined Version with self highlighting could have been an added extra. Would have been more helpful to compare two versions on same screen.*
- *How we had to keep referring to each version in turn and could not access all poems at the same time.*

C) Using the left hand text, is it possible to find out which version a particular word was from? E.g that the word "Besely" was from the Unmodernised Version? What did you do to find this out?

- *I couldn't*
- *I clicked through a certain number of times for each corresponding version. Where only three or so words/ alternatives were available through. I had to check the right-hand side text.*
- *[unanswered]*
- *[unanswered]*
- *If you click on the word it corresponds to the amount of versions i.e. one click = version 1, and 8 clicks = version 8.*
- *[unanswered]*
- *Yes, but only by counting or going through right hand version.*
- *[unanswered]*

D) Name as many reasons as you can why you think the exercises on this sheet would be easier or more difficult to do using paper copies of the poem (and not electronically!).

- *It would take longer to see how many variants of each individual word there were.*
- *[unanswered]*
- *[unanswered]*
- *[unanswered]*
- *It would be easier to show all of the texts simultaneously on paper.*
- *[unanswered]*
- *[unanswered]*
- *You could see more...*

Five of the students Group A did not answer this question.

E) Which text did you find you used the most – the Combined Version (on the Left Hand Side), or the Individual Version(s) (on the Right Hand Side)? Why was this?

- *[unanswered]*
- *Combined Version*
- *[unanswered]*
- *[unanswered]*
- *[unanswered]*
- *[unanswered]*
- *[unanswered]*
- *Individual Version*

F) Make a note below of approximately how much time you spent using the two sets of the poem (e.g. X minutes using the Combined Version (on the Left Hand Side), and X minutes using the Individual Version(s) (on the Right Hand Side)).

This question was unanswered by all respondents due to time constraints.

G) Did you encounter any problems using the application? Please write below any comments you have, to help improve the application.

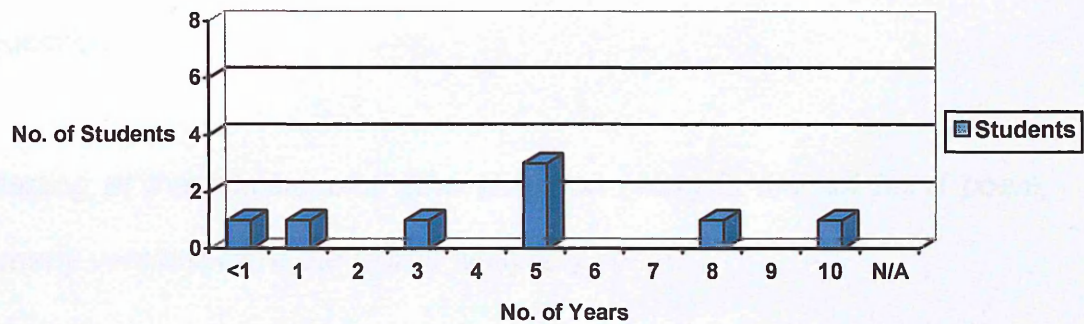
This question was unanswered by all respondents due to time constraints.

9.5.2 Results: Group B

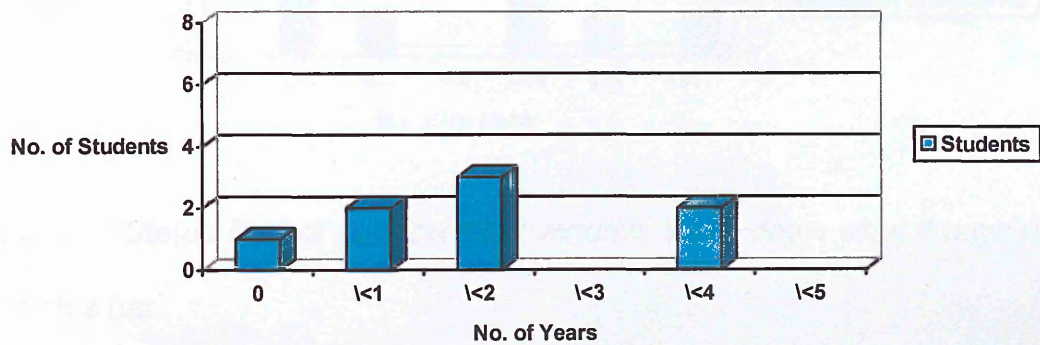
Group B was comprised of 8 undergraduate students from English Studies.

SECTION 1: Familiarisation

A) How long have you been using a computer?



B) How long have you been using the World Wide Web?



C) Have you come across multiple versions of a text before? If so, which text?

7 students had not encountered multiple text editions before, 1 student had encountered the text "Poetry" by Marianne Moore.

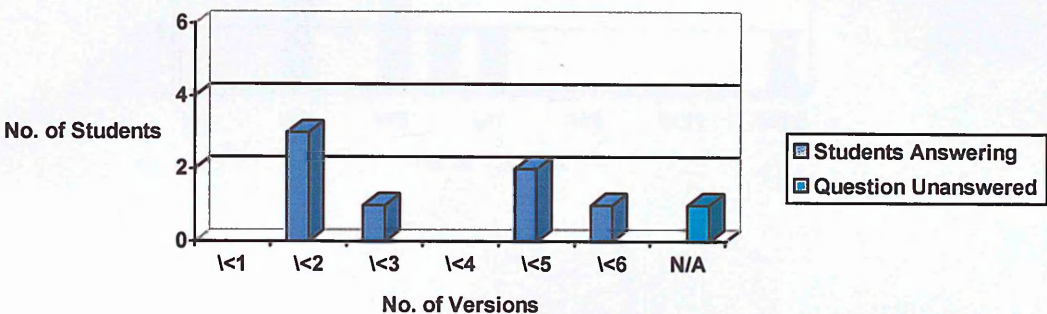
D) How many variants of the word "stalking" can you find around all eight versions?

100% of students gave the correct answer, 2 variants.

E) Using the poem on the left hand side, how many colours can be chosen to highlight the variants?

7 out of 8 students gave the correct answer of “4”. 1 student did not answer the question.

F) Starting at the “choicepoint” (the Question Mark) in the left hand poem, how many versions have the words “vnkyndly so” in?

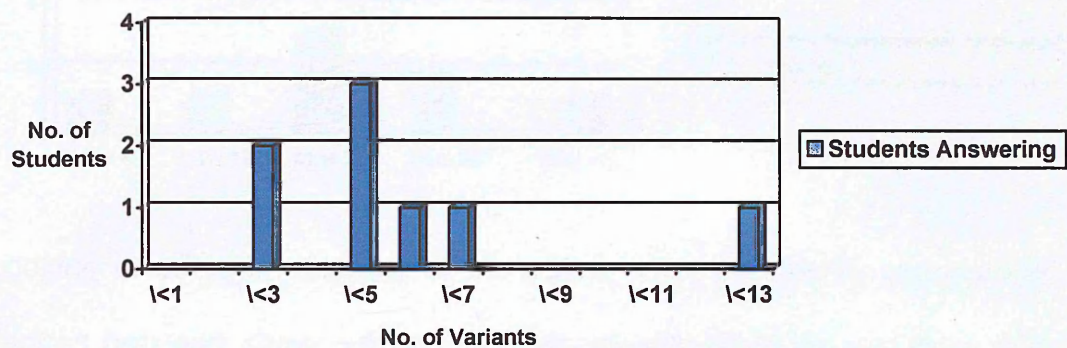


G) Find the “Status Bar” of your browser window. Write down what it says on your status bar.

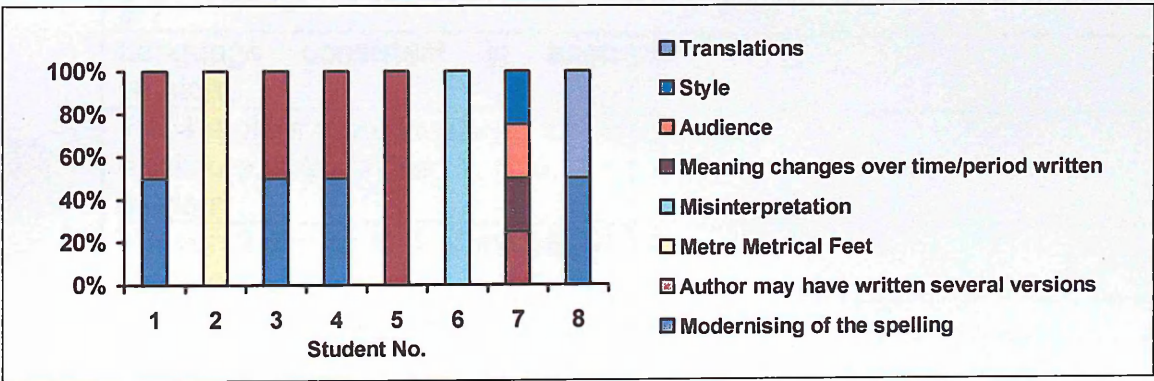
	No. of Clicks	Log Box 1	Log Box 2	Log Box 3	Log Box 4	Log Box 5
Student 1	241	225	0	0	0	0
Student 2	38	38	0	0	0	0
Student 3	82	82	0	0	0	0
Student 4	124	0	0	0	0	0
Student 5	108	0	0	0	0	0
Student 6	54	54	0	0	0	0
Student 7	209	171	0	0	0	0
Student 8	238	210	0	0	0	0

SECTION 2: Literary Questions/ Tasks

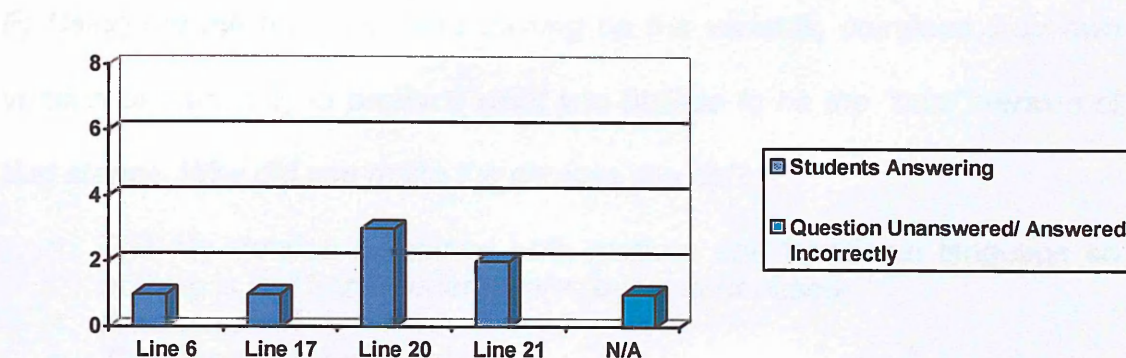
A) How many variants can you find between the last 5 lines of Version 3 and the last 5 lines of Version 7?



B) Can you think of any reasons why one version of the text might be different from another? Give as many as you can.



C) Find the line in the poem that you think has the most significant or contentious variant between versions and why that is? (i.e. the variant changes the meaning of the line or poem as a whole).



D) Looking at all eight versions of the poem, can you identify any general similarities between some editions but not others? What do you think they are?

Answers	Number of Students
Some more modern than others	2
Versions 1,2,4, & 8 are more old fashioned	1
Similarities between 3 & 5, and 2 & 7	1
Language consistent in each version	1
1 & 4 = older type language; 2 & 8 = mixture of language; 3, 5, 6, 7 = modern	1
Version 2 similar to 4, Versions 5= modern	1
1 & 4 have similar rhymes	1

E) What do you think are the most significant substantive variant(s) between Version 3 and the other versions of the poem? Why do you think that?

- Language and word spelling. The University has modified the poem
- [Unanswered]
- The language used because 3 is written in modern from another country. Most of the others are older versions.
- Language and word spelling, changed by the University.

- *“Bread” to “Bred”*
- *Again: since & kindly, syns & unkyndly, terned & turned*
- *Line 20 syns & since - changes meaning. Line 21 I would fain know (3) How like you this (2)*
- *American Language – more grammar*

F) Using the left hand text and clicking on the variants, compose your own version of stanza 3, to produce what you believe to be the “best” version of that stanza. Why did you make the choices you did?

- *The My Version combined both modern and traditional language so nothing is lost from modernisation but is understood.*
- *[Unanswered]*
- *They were modern words*
- *2 combine modern and traditional language, so it is understood but nothing is lost*
- *3 Univ Toronto – it seems to make the most sense grammatically*
- *[Unanswered]*
- *Prefer modern poetry to old style language*
- *Modern language but close to original text*

9.6 An Overview of Results and Findings

I noticed that some of the students in Group B appeared not to have understood the overall concept and problem of multiple texts, as they mentioned the word “original” in their answers in reference to a version of the poem. Question 2d asks the respondents to look at all eight versions of the poem and identify any general similarities between the editions, three of the student replies were as follows:

Student 1: “So [sic] are more modern than others, the language is similar. First printed and original versions – similar”

Student 2: “some modernised are similar. First printed and original versions = similar”

Student 3: “Version 2 similar to original & 4”

In hindsight, it may have been more effective to reconsider the names given to each of the eight versions of “They Flee From Me” used in the electronic edition. There is a possibility that the potentially ambiguous titles given to each work may have affected students’ decision-making when considering selecting variants to compose their own edition of the poem.

By observing users working with the Drag n’ Drop edition of the text, I found that several appeared to spend the majority of the allocated time for looking at alternative interfaces, using just this one example. One student in particular invested his time completing a whole copy of the poem using just this edition. The video clips in Appendix 4 show the students’ interactions and discussions with the texts.

Overall, students found the ‘Drag n’ Drop’ example the most effective to use, as they could manually re-position the variants as required, and could see all textual variants of a word onscreen at any one time. However, students found that limitations included lack of clarity about the origins of each variant (i.e. which text each individual word had come from).

To evaluate my activities as a developer, I would consider how my various contributions may have influenced the users/readers of the electronic edition. I have attempted to take a step back from having to make many of the decisions of an editor by designing an electronic edition which includes as many potential choices as possible for the user. Despite this intention, my

involvement still consists of many other decisions which can affect the outcome of editorial user choices.

In terms of presentation, I have made conscious decisions to select certain interaction methods over others, and only those chosen were offered to the user to trial. I also made the decision to select eight online versions of the poem from those available, and provided limited information on the provenance of those particular texts. I have displayed the texts in the edition using a default font, and also chose not to include alternative titles for the poem in the edition. For example, some versions of the poem are entitled: "The Lover Showeth How He Is Forsaken Of Such As He Sometime Enjoyed". All these aspects can have implications for the decisions made by the user, and by attempting to sidestep the role of editor I have in many ways made more editorial decisions about the resource as a whole.

9.7 Troubleshooting and Debugging

The testing undertaken provided a useful source of feedback on possible errors or bugs in the application. For example, when a group of students were using the "They Flee From Me" application, one student noted that there had been an error in the encoding, and that when he had compared the full copy of one of the texts with the combined edition, that particular textual variant had been incorrect. This finding was therefore useful to be able to go back to the encoding and make the relevant changes before undertaking further testing.

9.8 Project Management

9.8.1 Project Development Issues

The most significant issue encountered seems to be how to ensure the text will be displayed clearly on one page given the amount of text involved - whether to include the play in one long file, or whether to segment the editions into separate frames or to hide and reveal sections hidden behind buttons. In the prototype of “They Flee From Me” the variants are hidden behind a marker, which when clicked upon, each time reveals a variant from a different edition. This is a very economical method of displaying the variants, as it does not require an abundance of onscreen space, but this may not be wholly suitable for a lengthier text.

In addition to the issue of text length, there is also another significant problem of “missing lines” (or even scenes) between the editions. For example, in *King Lear*, the folio contains no Act IV, Scene III, but this is present in the quartos. Hiding or revealing sections of the text could be beneficial in this case, able to conceal the scene which is present in Q but not F, when comparing the editions.

In encoding with XML, I had some initial issues with not being able to parse certain symbols, but this was overcome by identifying the correct character entity reference.¹⁶⁸ For example, the ampersand could be replaced with `&`; and this would then parse correctly, although this did contribute to the time-consuming nature of coding by hand.

¹⁶⁸ W3C Character Entity References in HTML 4, <http://www.w3.org/TR/html4/sgml/entities.html> (accessed June 15, 2008).

9.9 Miscellaneous Project Issues

9.9.1 A Multidisciplinary project

Multidisciplinary issues have arisen between the domains of literary studies and computing, which have served to illustrate the clash of cultures between these two areas of research. In order to overcome misunderstandings in terminology in particular, a Glossary of terms was produced to provide a source of reference for those in both domains.

9.9.2 Fonts

Simple sans serif fonts were chosen to display the textual material, as these give a sense of consistency to look of the texts, rather than attempting to include specialized fonts which may not be available on all machines, and which might cause difficulties for readers who are unfamiliar with this kind of typeface. It is of course important for readers to be aware of the existence of these fonts and traditional printing methods, however, the Active Reading interface is not the place for this information – this can be included elsewhere, perhaps included as part of the teaching process in the classroom.

9.10 Personal and Professional Development

The PhD has provided me with skills in research methods, in quantitative and also qualitative analysis, and in preparing material for presentations both on paper and electronically. I have had the opportunity to present my work at several International conferences, and to experience the process of being involved in the preparation of multi-author journal articles and papers.

Developing skills in new programming languages and in exploring the capabilities of text encoding and markup, has enabled me a better understanding of the domain of Humanities Computing. The project has provided an opportunity to observe first-hand the use of electronic editions by students who will eventually (it is hoped) use them in their work, and to gather feedback from users about their experiences with multiple texts and with the use of the prototypes.

10 Conclusions, Retrospective Analysis and the Future

“The basic assumption of most editorial practice is that behind the obscure and imperfect text is a clear and perfect one...”¹⁶⁹ This has proved to be untrue in most cases, as it is rare ever to find “the original” and perfect text (if one ever existed), amongst potentially dozens of versions and manuscripts of that text. The benefit of the text I have edited for this project is that no one version of that particular text is cast aside in favour of another. All versions of the text are included for reference and there is no original or base text, but a series of versions which each have variants independent from the other.

Should the electronic edition attempt to become a copy of the traditionally paper-based text, but in electronic form? Users who were untrained in using the application appeared to believe this to be so. However, interactive elements have been shown to help users to engage with the text, and to take on ownership of a text, by being able to modify words and punctuation themselves. For a user that has been trained to use the application, interactivity opens up a whole new arena termed “personal editing”.

What it is important to remember is that learning is a very personal experience. In most cases no two students learn in exactly the same way. This became self-evident throughout the evaluative phase, where users were responding to what might at first appear to be simple tasks or questions, by using very different methods, and many appeared to have pre-conceived

¹⁶⁹ Stephen Orgel, “What Is an Editor?”, *Shakespeare Studies* 24 (1996): 24.

notions of what the electronic edition of "They Flee From Me" should be able to do. Although it is important to live up to user expectations, it is also important to provide a tool that will enhance the reading experience and enable readers to have basic access to variants between different versions of a text.

By interactively engaging with the text, readers are allowed to make personal editorial decisions drawing from a plethora of available variants and textual versions. The objective of the work is to better understand and support this creative process¹⁷⁰, and to produce an account of editing from which future multiple-text electronic editions can be formed.

Now that the tools for electronic editing are freely available to readers, there is no reason why any person should not try their hand at editing a piece of text. There are currently no preventative measures by which to regulate the editing and publishing of material electronically, and no reason why the process of editing itself shouldn't be used as a means to aid understanding of texts.

The lack of peer review illustrates the precarious nature of this editorial freedom, in that there is no central board of regulation for the work that these electronic editors produce if they are intending it to be published in the public domain. Readers can no longer be shielded within the safety of works edited for well-known publishers in the physical world, such as Penguin, Oxford, or

¹⁷⁰ Chris Roast, et al., "Re-creating the Reader", 109.

Arden. They can find themselves in a sea of works manipulated by unseen editors possibly from unofficial institutions, and have to set themselves the task of navigating countless webpages to find reliable material, never quite sure if the text they read onscreen has been altered by a professional editor, or by the person sitting next to them in class.

The publishing of electronic scholarly editions produced solely for viewing on the World Wide Web means that there is often only the very current or most recent version of that edition available in the public domain. Earlier versions may well have been deleted, or archived in a database inaccessible by the general public for reference. Editors can then therefore feel free to re-edit as much as they want. There is no need for amendment or erratum sheets to be included in future editions of that version, they can simply add or delete the selected part of the text which they wish to alter, and leave no trace of that correction should they so wish. For bibliographers of the future though, this poses a huge problem, in that, should they be tracing the work of an author who publishes their work electronically and nowhere else, there may well be no trace of earlier editions for them to work from.

The editing and hand-encoding work on *King Lear* has been a time-consuming task. I initially approached the text by producing my own XML markup scheme and used this to encoding the three versions of the play. During the course of the project I decided instead to adopt the TEI's guidelines for encoding, to enable the work to be more easily shared with other projects. Although the encoding I completed using my own markup

scheme has not ultimately been chosen, the time I spent on developing this allowed me to gain a better understanding of XML and how it can be customized for a specific purpose.

This new encoded example from *King Lear* and my investigations into the use and reading of varying types of electronic editions by students, can serve as a recommendation or template for future development. The nature of the research into interactivity and into finding different methods of displaying the text is very much an experimental process, and therefore it is not always simple to define a static framework for development. Future work could involve additional observational studies of some of the implemented prototype examples used by the target readers. The exploration and development of tools to aid electronic editions has been very much about process. It has enabled me to support the learning outcomes of undergraduate English Studies units such as Introduction to Poetry 1550-1750, and to examine the tools students use to undertake the editing of multiple texts.

I would anticipate that future developments in a project such as this would involve looking further at the generation of variants between published editions of a work, in particular that of longer texts. It could also involve making decisions with regard to how many of the variants should be encoded successfully, and to what level they need to be encoded, for example should encoding be by letter or individual punctuation mark, or by words or groups of words. It has been useful to produce a design rationale/ account of the

editorial process, to document the overall process for use in the production of future editions, or revisions of existing editions.

Producing prototype editions with the effective interface and display methods to serve the purpose will be the primary goal of the practical element of the research. It has been useful to look at cognitive aspects such as memory – how much the user has to remember in order to use the application, for example if they have to remember the different spellings, or if they can clearly see them or return to view them. It would also be interesting to apply various cognitive strategies to the interface design using methods such as the Educational Multimedia Cognitive Walkthrough (EMMCW),¹⁷¹ and to complete usability studies to identify potential user interaction problems and possible comprehension problems¹⁷².

10.1 Statement of Originality

The PhD by Edition is a standard qualification within Literary Studies, enabling, in this case, a unique and creative way of viewing and interacting with textual variants within several editions of a text. In particular, when working towards a practice-based PhD it is important to establish the originality of the practical element of the work. In producing an electronic edition collating a number of versions of a text, research into existing editions has been completed. There are very few accounts of the creative activity of

¹⁷¹ Maia Dimitrova, Helen Sharp, and Stephanie Wilson, "Educational Multimedia Cognitive Walkthrough: Supporting the Prediction of Valid User Problems", *Proceedings of the 16th British HCI Group Annual Conference*, Vol. 2, eds. Helen Sharp, Jenny LePeuple, Peter Chalk, and John Rosbottom, (London: BCS, 2002), 26.

¹⁷² Maia Dimitrova, Helen Sharp, and Stephanie Wilson, "Categorising and Reporting Usability Problems of Educational Multimedia Interfaces", *Proceedings of the 16th British HCI Group Annual Conference*, Vol. 2, eds. Helen Sharp, Jenny LePeuple, Peter Chalk, and John Rosbottom, (London: BCS, 2002), 34.

editing, and in particular editing an electronic text – this research aims to provide such an account for reference in the development of future editions. Although other e-editions of multiple-version texts exist, there are few which explore the potential impact of variants between versions on the text as a whole, and none to make available this material adequately and effectively through the use of interactivity.

There are a number of encoded editions presenting examples from the works of Renaissance texts, and Shakespearean texts in particular, but few which attempt to present more than one published edition of one specific work. There are however no existing encoded works which combine so many of the published editions of one work marked-up in such detail, and none which display variants in the interactive way in which they are approached in this research work. The research practice aims to contribute by providing an example of the encoding of all variants of all the published editions of a specific work, and to make examples of multiple texts simultaneously available on one single screen.

By producing a design rationale/ documentation of the specific editing processes used, it is intended that future editions can be generated using the methodology as a template. Although XML in itself is not a new technology, employing the use of XML to encode the texts offers the benefit of future electronic editors being able to clearly see the decision-making process through the code (as well as being able to reference the methodology and design rationale). By being able to separate style from content in this way,

future e-edition developers would more easily be able to revise and modify the appearance of new editions without losing any of the most important content (the text editions themselves). The contribution to knowledge is in the domain of Humanities Computing, and by making the combined text available, the significance of variants between versions of a published text can be realised.

One of the most interesting elements of the work has been observing the use of the application amongst the target users – first year undergraduate students of English Literature. It has been a novel process for me to experience the thought-process of users as they interact with and edit an electronic text, and to be able to collate feedback on how they would like to be able to perform the task of editing and comparing texts electronically.

10.2 Relevant Publications and presented papers

The findings of the research have been presented at several international conferences, and the following publications have been produced in conjunction with the project:

Thomas, Stephanie F. *The Exploration and Development of Tools for Active Reading and Electronic Texts, New Technologies and Renaissance Studies*. Edited with William R. Bowen (U Toronto). Tempe: RSA / Medieval and Renaissance Texts and Studies. 250 pp. Forthcoming.

Thomas, Stephanie F. "Finalizing the Multiple-Text Electronic *King Lear* for use in the Classroom." Paper presented at the 17th Joint International

Conference of the Association for Computers and the Humanities and the Association for Literary and Linguistic Computing (ACH/ALLC), 239-240. Victoria, BC, Canada, Jun 15-18, 2005. ISBN 1-55058-308-5. Humanities Computing and Media Centre, University of Victoria, 2005.

Thomas, Stephanie. "Review: Christie Carson and Jacky Bratton. Eds. 2000. *The Cambridge King Lear CD-ROM: Text and Performance Archive*. Cambridge: Cambridge University Press". *Renaissance Forum*, Volume 6, Number 2, Winter 2003. ISSN 1362-1149.

Roast, Chris., Ritchie, Innes and Thomas, Stephanie. "Re-creating the Reader - Supporting Active Reading in Early Modern Literary Research". *Communications of the ACM*, 45(10): 109-111, October 2002.

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Appendices

Appendix 1

1.1 A Glossary of Terms: Definitions for Literary Studies

Base Text

The base text may be thought of as the form of the text, or the literary edition, of any particular book that was current (during any given period) before a new, creatively developed literary edition. The base text functions with respect to subsequent variant editions in a manner analogous to an original or correct reading in relation to variant readings, whether expansions, revisions, or errors.¹⁷³

Document

The actual physical material of the text.¹⁷⁴

Draft

A preliminary form of a version that has no substantial existence. It is difficult to tell when a particular collection of words and punctuation represents a draft, and when it is an entirely new version. To some extent, their distinction must be made arbitrarily.¹⁷⁵

Text

The actual order of words and punctuation as contained in any one physical form. Has no substantial/material existence itself: the text can exist simultaneously in more than one form. e.g. In the reader's memory, on the page. The capacity of a text to (mis)represent a version depends on errors.¹⁷⁶

Variants

Variants are differences between more than one copy of a text, they are most visible in manuscripts where no two copies are exactly the same. Whether through accident or intention: a scribe may misread the copy from which he works, or try to make sense of a passage by altering it. But although the number of variants is sharply reduced by printing, they are still plentiful.

Twentieth-century textual critics distinguish two broad classes of variants, *substantive* and *accidental*. Substantive variants are those that change the sense of the text: the substitution of one word for another, for instance. Accidental variants are those that don't affect the meaning: the use of uppercase or lowercase letters, for instance; changes from British to American spelling; or differences in line-end hyphenation. Of course,

¹⁷³ Eugene Ulrich, "Multiple Literary Editions: Reflections Toward a Theory of the History of the Biblical Text", in *Current Research and Technological Developments on the Dead Sea Scrolls*, Conference on the Texts from the Judean Desert, Jerusalem, 30 April 1995, eds., Donald W. Parry and Stephen D. Ricks (Leiden: Brill, 1999), 96.

¹⁷⁴ Beth Armitage, "Editions and Ideologies: the Quest for the 'Best' Text(s)". (Peter Shillingsburg's Definitions for Literary Studies) Oct 18th 2001, <http://web.uvic.ca/~barmitag/shillingsburg.html> (accessed February 12, 2003).

¹⁷⁵ *Ibid.*

¹⁷⁶ *Ibid.*

determining whether any particular variant is substantive or accidental is often a judgment call.¹⁷⁷

Version

One specific form of the work. The work as intended by the author at a given moment in time. Has no substantial existence, and is represented more or less well by the text. The sequence of words and punctuation the author intended to put in readable form.¹⁷⁸

Work

A product of the author's imagination, represented by physical forms. It has no substantial existence itself.¹⁷⁹

1.2 Glossary of Terms: Some Definitions for Computing

Annotation

(In hypertext) A new commentary node linked to an existing node. If readers, as well as authors, can annotate nodes, then they can immediately provide feedback if the information is misleading, out of date or plain wrong.¹⁸⁰

Authoring

Creating a hypertext or hypermedia document.¹⁸¹

Text

In information technology, text is a human-readable sequence of characters and the words they form that can be encoded into computer-readable formats such as ASCII.¹⁸²

Text Editor

A text editor is a computer program that lets a user enter, change, store, and usually print text (characters and numbers, each encoded by the computer and its input and output devices, arranged to have meaning to users or to other programs).¹⁸³

¹⁷⁷ Jack Lynch, "Glossary of Literary and Rhetorical Terms", Rutgers University, Aug 3, 1999, <http://newark.rutgers.edu/~jlynch/Terms/variant.html> (accessed June 15, 2008).

¹⁷⁸ Beth Armitage, "Editions and Ideologies".

¹⁷⁹ Beth Armitage, "Editions and Ideologies".

¹⁸⁰ FOLDOC (The Free On-Line Dictionary of Computing) definition of "annotation", [last update: Nov 26, 1995], <http://foldoc.doc.ic.ac.uk/foldoc/foldoc.cgi?annotation> (accessed June 15, 2008).

¹⁸¹ FOLDOC definition of "authoring", [last update: Nov 7, 1994], <http://foldoc.doc.ic.ac.uk/foldoc/foldoc.cgi?authoring> (accessed June 15, 2008).

¹⁸² Whatis.com definition of "text", http://whatis.techtarget.com/definition/0,,sid9_gci213125,00.html (accessed June 15, 2008).

¹⁸³ Whatis.com definition of a "text editor", http://whatis.techtarget.com/definition/0,,sid9_gci213127,00.html (accessed June 15, 2008).

Appendix 2

2.1 Participant Information Sheet

PARTICIPANT INFORMATION SHEET

Classroom-based Trial of *They Flee From Me* Electronic Editions

1. Title

Classroom-based Trial of *They Flee From Me* Electronic Editions

2. Opening statement

The application is part of a project looking at new ways to present and access literature, in particular looking at the editing process. The feedback of English students using the application would be very useful in developing the project further, and therefore there are no right or wrong answers to the exercises and you will *not* be assessed on your responses!

3. 'Why have you asked me to take part?'

The findings from this study will be useful to me in my research; undergraduate English Studies students are the target users of the electronic edition.

4. 'What will I be required to do?'

Please continue with discussion between yourselves as you would in a normal seminar situation, and try not to be distracted by the camera.

5. 'Where will this take place?'

Computer Labs, Mundella House, Collegiate Crescent.

6. 'Who will be responsible for all of the information when this study is over?'

The study investigator, Stephanie Thomas, will be responsible for the information.

7. 'Who will have access to it?'

The study investigator, Stephanie Thomas, and her PhD supervisory team.

8. 'What will happen to the information when this study is over?'

The data will be contained within my thesis, which will be available in Sheffield Hallam University Library and the British Library.

9. 'How will you use what you find out?'

The data from the study will be used as part of my research, and will therefore be included as part of my thesis, and in conference paper(s) and presentations.

10. 'Will anyone be able to connect me with what is recorded and reported?'

The identity of students will be protected at all times. Survey sheets are anonymous, and video data (which does not name students) will only be used within academic circles for the purposes of this research.

11. 'How long is the whole study likely to last?'

The study will last for the duration of the seminar (1 and a half hours).

12. 'How can I find out about the results of the study?'

If you would like to be informed of the results of the study, please leave your name and email address the tutor.

13. 'What if I do not wish to take part?'

Participation is totally voluntary, although the seminar itself is part of your academic course. If you do not wish to take part in the study please notify your tutor at the start of the session.

14. 'What if I change my mind during the study?'

You are free to withdraw from the study at any time, please notify your tutor.

15. Details of who to contact with any concerns.

Please contact either you tutor, or myself Stephanie Thomas stephanie.f.thomas@student.shu.ac.uk

2.2 Participant Consent Form

Consent Form

Classroom-based Trial of *They Flee From Me* Electronic Editions

Please answer the following questions by circling your responses

- | | | |
|--|-------|----|
| Have you read the information sheet about this study? | YES | NO |
| Have you been able to ask questions about this study? | YES | NO |
| Have you received answers to all your questions? | YES | NO |
| Have you received enough information about this study? | YES | NO |
| Who have you spoken to about this study? | | |

Do you understand that you are free to withdraw from this study:

- | | | |
|-------------------------------------|-----|----|
| • At any time? | YES | NO |
| • Without giving a reason for with? | YES | NO |

Do you agree to take part in this study?	YES	NO
--	-----	----

Your signature will certify that you have voluntarily decided to take part in this research study having read and understood the information in the sheet for participants. It will also certify that you have had adequate opportunity to discuss the study with an investigator and that all questions have been answered to your satisfaction

Signature of participant:..... Date:.....

Name (block letters):.....

Signature of investigator:..... Date:.....

2.3 Questionnaires

"They Flee From Me" – Questions & Tasks

Please tick which seminar group you are in:

- ☐ **10:00-11:30 (Session 1)** ☐ **11:30-13:00 (Session 2)**

Introduction

The application is part of a project looking at new ways to present and access literature, in particular looking at the editing process and the instability of multiple edition texts. The feedback of English students using the application would be very useful in developing the project further, and therefore there are no right or wrong answers to the exercises and you will not be assessed on your responses!

The main application or e-Edition called "Frames" consists of the eight published versions of the poem "They Flee From Me" by Sir Thomas Wyatt. You are asked to read the "University of Toronto" version of the poem to begin with (version 3), and then look at the other versions. You are then asked to analyse the eight versions of the poem in terms of how they are different from each other, and answer the questions below.

Questions/ tasks can be completed by working with another student, but try and write your own answers. The sheet is anonymous, so you don't have to put your name on it! Answers should be written on the question sheets and submitted to the tutor at the end of the session. Please write on the backs of the sheets or on the bottom of page 5 if you need more space, and ask any questions if you need some help.

Getting Started

- Login to the computer with your name and password
- Open Internet Explorer, and type the following into the address bar at the top:

<http://homepages.shu.ac.uk/~sfthomas/activeR/mydocs.html>

- Click on the first example on this page called "Frames" – you can click on the icon or the hyperlink to take you to the page.
- When you have the page open and the poem in front of you, complete the questions and tasks below. Try and keep a track of roughly how long you spend on each section.
- Please do **NOT** "refresh" the page, or use the "Back" or "Forward" buttons of your browser until you are told to do so, as your work will be lost.

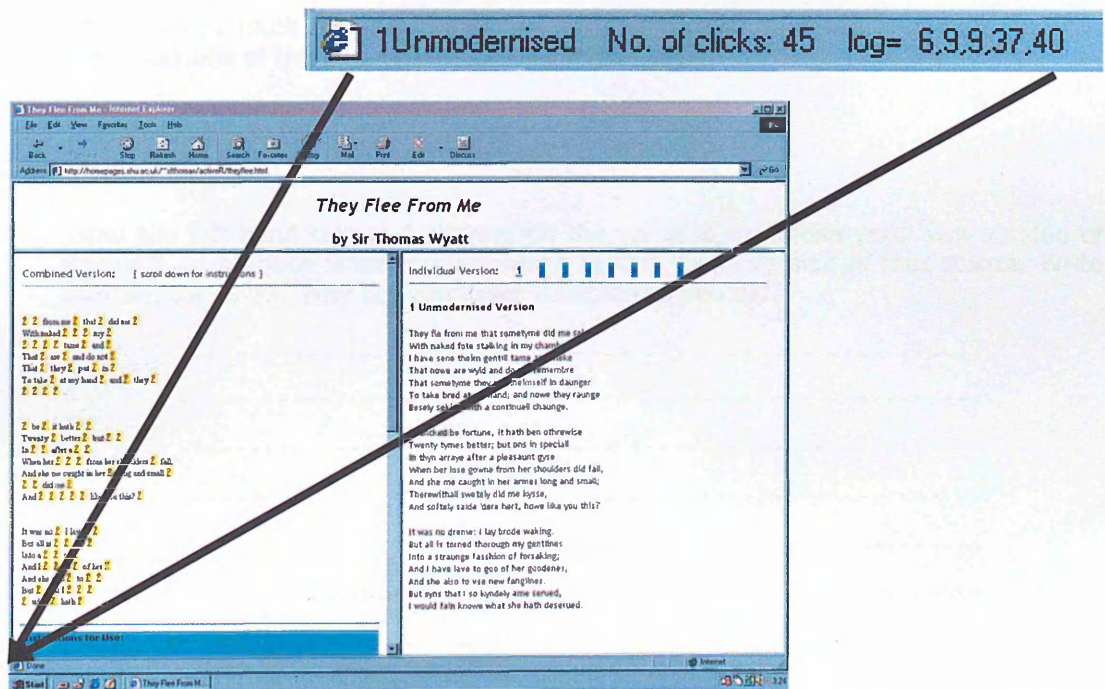
CONTENTS

Page 1	Introduction / Getting Started
Page 2	Section 1: Familiarisation / Getting to Know the Application
Page 3	Section 2: Literary Questions / Tasks (a) "Frames" e-Edition
Page 4	Section 3: Literary Questions / Tasks (b) Other e-Editions
Page 5	Section 4: Application Questions / Tasks: "Frames" e-Edition

SECTION 1: Familiarisation

Firstly, are you: ☐ Male or ☐ Female

- A) How long have you been using a computer? _____
- B) How long have you been using the World Wide Web? _____
- C) Have you come across multiple versions of a text before? If so, which text(s)? _____
- D) Start by clicking on the question marks in yellow ("choicepoints") in the left hand poem. How many variants of the word "stalking" can you find around all eight versions? (You can also check this on the right hand side where you can see the whole of each version at once. Just click on a number and it will take you to the number of the version you want.) _____
- E) Using the poem on the left hand side, how many colours can be chosen to highlight the variants? Set the variant colour to the colour of your choice (it may take a few seconds before you can click on words again). _____
- F) Starting at the "choicepoint" (the Question Mark) in the left hand poem, how many versions have the words "vnkyndly so" in? _____
- G) Find the "Status Bar" of your browser window; this is in the bottom left-hand corner of your computer screen or window and might look something like this:



The status bar tells you which edition the variant is from (when you hover your mouse over that variant). Write on the dotted line below what it says on your status bar (there is no right or wrong answer), and fill in the boxes below.

No. of clicks:

log =

SECTION 2: Literary Questions / Tasks (a) "Frames" e-Edition

- A) How many variants can you find between the last 5 lines of Version 3 and the last 5 lines of Version 7? A variant can be one word or a group of words linked together.

- B) Can you think of any reasons why one version of the text might be different from another? Give as many as you can.

- C) Find the line in the poem that you think has the most significant or contentious variants between versions and why that is? (i.e. the variant changes the meaning of the line or poem as a whole).

- D) Looking at all eight versions of the poem, can you identify any general similarities between some editions but not others? What do you think they are?

- E) What do you think are the most significant variant(s) between Version 3 and the other versions of the poem? Why do you think that?

- F) Using the left hand text and clicking on the variants, compose your own version of stanza 3, to produce what you believe to be the "best" version of that stanza. Write your stanza below. Why did you make the choices you did?

Reasons for your choices:

SECTION 3: Literary Questions / Tasks (b) Other e-Editions

A) Before you leave the "Frames" e-Edition, look at the status bar (see Section A), and write down in the space below your "no. of clicks", and the five numbers after the word "log". You might have to hover your mouse over one of the question marks to see these words on the status bar.

No. of clicks: log =

Now, please click the "BACK" button on your browser to return to the Active Reading menu page. Have a look at the next five e-Editions of "They Flee From Me" by clicking on the links one at a time.

- B) Using the "Drag n' Drop" example: How many variants can you find in the second line of stanza two?
- C) Using the "Spanning" example: Can you find any reference that might relate to the length of the poem within the text? On which line do you find this information? What does it say? Note: it may be more than one word.
- D) Using the "Floats" example: Compare Line 3 Stanza 3 of Versions 2 and 6 of the poem. Which word changes most significantly between the versions? Why do you think this is?
- E) Please look again at each of the six e-Editions of "They Flee From Me", and rank them one to six (six being the best) in the order in which you found them most useful for examining the text.

Name of Edition:	Rank 1-6	Likes / Dislikes of this Edition:
(1) Frames		
(2) Drag n' Drop		
(3) Spanning		
(4) Painting		
(5) Cycling		
(6) Floats		

SECTION 4: Application Questions/ Tasks: "Frames" Edition

All the following questions relate to the "Frames" Edition:

- A) What aspect(s) of the application did you find most helpful to you in completing the tasks and why?
- B) What aspect(s) of the application did you find most unhelpful to you in completing the tasks and why?
- C) Name as many reasons as you can why you think the exercises on this sheet would be easier or more difficult to do using paper copies of the poem (and not electronically!).

Easier because:

More difficult because:

- D) Which text did you find you used the most - the Combined Version (on the Left Hand Side), or the Individual Version(s) (on the Right Hand Side)? Roughly how much time did you spend using each and why was this?
- E) Did you encounter any problems using the application? Please write below any comments you have to help improve the application.
- F) Would you consider using a similar electronic tool/edition for examining textual variants in other texts you may be studying, for example Shakespeare? Please explain your answer.
- G) What has this exercise taught you about the study of literary texts?

Thank you for participating! If you would like to know more about the project or have any further thoughts about the application, please contact me:
stephanie.f.thomas@student.shu.ac.uk or speak to one of my supervisors (Dr Matthew Steggle or Prof. Lisa Hopkins).

Appendix 3

Please see folders on the attached DVD.

- 3.1 “They Flee From Me” (Frames Edition).**
- 3.2 “They Flee From Me” (Drag N’ Drop Edition)**
- 3.3 *King Lear* (Drop-down Box Prototype)**
- 3.4 An Example from my original scheme for XML Encoding**
- 3.5 Act I of *King Lear* in TEI XML**
- 3.6 Prototyping Storyboards in PowerPoint and Director**
- 3.7 “They Flee From Me” (Experimental Editions)**
- 3.8 Available TEI Tagset used for encoding *King Lear***

Appendix 4

- 4.1 Prototype trials digital video: select sessions.**

Please see attached DVD.