THE ART OF MEDICINE AND THE ART OF DESIGN: MANUSCRIPT MISE-EN-PAGE
AND THE THIRTEENTH-CENTURY MEDICAL CLASSROOM

by

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Abstract

Teaching in the classrooms of the early universities was primarily done in the scholastic mode, which prioritized classroom dispute and formal argument. This instructional practice was applied in law, theology, and arts faculties, as well as medicine. Although scholars have begun to explore the role of scholasticism in medical teaching during this formative period, the impact that it had on the design of manuscripts intended for medical education has yet to be addressed systematically. I study the range of design choices implemented by scribes when producing these medieval medical textbooks—the Articella and Ars commentata—using a corpus of eighty total manuscripts produced during the thirteenth century. In the course of this study, I develop and present a novel, visual analysis-oriented framework, with which I assess manuscript page design in a systematic manner. This framework facilitates meaningful comparisons between corpora and in the case of this study its capacity for enabling comparison is demonstrated with a chronological analysis. This approach blends conventional manuscript studies with analysis of cultural context to facilitate understanding of the ways in which the needs of those teaching or studying medicine in a scholastic classroom are reflected on the page. The study has two main outcomes: an understanding of the ways that information was used and communicated in medical education, and a framework that enables structured and objective comparisons to be made between the page designs of different groups of manuscripts, irrespective of their time or location of production.
Lay Summary

Artisans who produced medieval manuscripts put considerable intellectual work into designing the layouts of books, which were produced for individual readers and researchers. For analysis, it is helpful to divide scribes’ labour when designing manuscript pages into two stages: assigning specific portions of each page for intended purposes, and filling in these spaces in ways that facilitate the anticipated uses of the book. The variety of uses were defined by the needs of the readers and researchers for whom the manuscript was produced. This thesis examines the surviving copies of the most common thirteenth-century medical textbook as a way of evaluating the efficacy of this research framework. It draws conclusions about the ways in which the first university students and teachers engaged with books and how specific design features encouraged effective engagement.
Preface

I arrived at the identification and design of my research program independently, with support from Dr. Erik Kwakkel, my supervisor, who has considerable experience studying medieval manuscripts and their design, particularly in the context of the thirteenth-century university, on which I focus. During the data collection phase, Dr. Kwakkel supported me in ensuring that my understanding of specific material features was accurate, and lent me his expert knowledge regarding historic practices contemporary to my period of study.

All assertions and writing contained in this thesis, unless otherwise attributed in footnotes, are my own, and I have personally produced the whole of the observations, data collection, and analysis contained in this thesis.
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Looking backward, it is crucial for me to acknowledge the kindness and inspiration of Terry Wasserman, who was for years my mentor guiding my course as a rare books librarian, and who taught me so much about how teaching should be undertaken when at its very best. I thank her for being a friend and guide to me as I was learning what kind of person I would work to become, both professionally and as a human.

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for Mike Karpinski

without whose inspiration and dedication
my goals would be but dreams
1. Historical, Historiographic, and Methodological Contexts

The manner in which text, images, and space are arranged on the pages of a book has a profound impact on how users experience and engage with the information being presented, and shapes the meaning that readers perceive in the text. The page layout of modern books—particularly textbooks, which have unusually complex layouts with a high number of text and visual components—is usually the result of extensive planning and forethought. Considerations in producing a book’s design include the book’s content, the intended audience, and other publications previously produced in the same field. This principle extends to the production of medieval textbooks, but with a twist: whilst modern books are produced for a group of users with anticipated needs that are assessed holistically, manuscripts were designed with an individual user or user group in mind. In most cases, scribes, in response to the preferences and requirements of each book’s purchaser, made intentional choices about how to present information by modulating how they executed the page design and overall physical appearance of each manuscript. This process embedded evidence about artisans’ design processes, users’ needs, and early commercial scribal production structures into the materiality of manuscripts preserved from this period—just as similar evidence in different corpora reveals information about the production priorities of other time periods and contexts.
Manuscripts containing university texts are a particularly fruitful corpus for exploring the connections between the choices made during the design process and the context-influenced requirements of the anticipated user. Medieval books that were made for use by university students employed a layout that reflected both the book’s function and the specific user’s needs as understood by the scribe responsible for the book’s production.¹ Much like modern textbooks, medieval university manuscripts tended to require additional intellectual and practical effort to produce and have particularly complex layouts with many text and visual components on each page. Therefore, there is a richer body of material evidence encoded in the design choices of the scribe responsible for producing that book. If studied in a systematic manner, this evidence is valuable for understanding the context of a manuscript’s production—as well as for exploring how readers used the books designed for them. As manuscripts were produced for individual purchasers for use in specific settings such as classrooms, their materiality can point to particularly rich conclusions about both anticipated and actual use.

¹ Erik Kwakkel, “Decoding the Material Book: Cultural Residue in Medieval Manuscripts,” in The Medieval Manuscript Book, ed. Michael Johnston and Michael Van Dussen (Cambridge: Cambridge University Press, 2015), 60-76. This chapter explores how material features inform scholarly knowledge about those who purchased and produced manuscripts and informs the theoretical and methodological approaches taken in this thesis.
1.1 Introduction to the Research

Teaching in the classrooms of the early universities was primarily done in the scholastic mode, which prioritized classroom dispute and formal argument. This instructional practice was applied in law, theology, and arts faculties, as well as medicine. The intellectual focus embodied by scholasticism was reflected in the structural elements incorporated into the material design of manuscripts produced for its practitioners. These design choices, such as the compartmentalization of page space and the use of visual cues that organize the text, were not merely aesthetic in nature; their use and structure reflected the intellectual and analytical expectations associated with early university culture. Scribes producing manuscripts in this context, whether for themselves or for hire in the commercial manuscript copying markets that expanded around the growing universities, would have been aware of these conventions as manuscripts containing university texts that were produced at all levels of quality tend

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to include at least some of them. Although scholars have begun to briefly explore the role of scholasticism in the production of medical textbooks during this formative period, the impact that the intellectual practice had on the design of manuscripts intended for medical education has yet to be addressed systematically. By drawing connections between this specific medical classroom context and the design of manuscripts produced for use in that context, a richer understanding of how medicine was taught and learned is revealed.

In order to explore the connection between manuscripts and their production contexts, I study the range of design choices favoured by scribes when producing these medieval medical textbooks. I do so by examining eighty manuscript copies of the *Articella* and its successor text the *Ars commentata*; throughout the period, these two versions of the text collection were in the most widespread use by early medical schools. Developed in the approximately 150 years between the translation of its constituent texts into Latin, which

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7 *Articella* is the name most often used to refer to this text collection in current secondary literature. However, it is not technically accurate; more correctly it would be referred to as the *Ars medicine* or the *Art of Medicine*, as distinguished from its successor the *Ars commentata*. The term *Articella* more accurately refers to the specifically Italian version of the collection.
commenced in the final quarter of the eleventh century, and the founding of the first universities between 1200 and 1300, the Articella collected texts that would in the following century spread and become the core of medical education in Latin-speaking Europe.\(^8\) The Articella provides a systematic outline of Galenic medical theory as well as the basics of Hippocratic practice from the perspective of diagnosis, prognosis and therapeutics... [the texts contain] easily memorisable general statements of fundamental medical concepts.\(^9\)

The brevity—usually Articella copies containing only the five to six core texts which tend to make up its contents occupy only thirty to forty manuscript folia—of this collection and the terse quality of its texts render it an “easily memorisable introduction for the beginning medical student.”\(^10\) This makes the Articella a particularly interesting cast subject for this particular design study, for several reasons that will become clear shortly—in brief, the collection is composed of texts intended for frequent consultation, compact presentation of essential information, and constant use in the scholastic

\(^8\) Eliza Glaze, Introduction to *Medicine at Monte Cassino: Constantine the African and the Oldest Manuscript of his* Pantegni, by to Erik Kwakkel and Francis Newton (Turnhout: Brepols, 2019), 23.


university context. These qualities, as will become apparent in the following chapters, tend to be linked with consequences for each stage of manuscripts’ production.

In the course of this study, one of my priorities is proposing a novel framework for analysing manuscript page design in a systematic manner that facilitates meaningful comparisons between corpora whose time, context, and method of production differ. Designed for use in learning environments, Articella manuscripts and their successor texts, called the Ars commentata, which were produced in the initial century of universities’ existence form an ideal corpus on which to explore the efficacy of a framework of this sort for assessing both historical page design processes and reader engagement through the material evidence of intellectual processes preserved in textbooks. The approach undertaken in this paper blends manuscript studies with information studies to facilitate understanding of the ways in which the needs of those teaching or studying medicine in a scholastic classroom are reflected on the page. I present two outputs of this research: an understanding of the ways that information was used and communicated in medical education, and a framework that will enable structured and objective comparisons to be made between the page designs of different groups of manuscripts, irrespective of their time or location of production.

The methodological framework that arises from the research conducted in the following chapters explores each of the three bodies of evidence preserved in the page design of books. These bodies of evidence correspond to three processes:
• Designing the page (e.g. relative sizes, placement of page elements)
• Executing the page (e.g. script, hypertext)
• Responding to the page (e.g. corrections, annotations)

The following research demonstrates that isolating and studying the layers of material evidence as separate entities enables one to analyse shifting norms at each design level and to address both reader and book-producer responses to these norms. The systematic division of material evidence enables comparison of page designs between different periods and different contexts, regardless of whether the books in question were produced using manuscript or print means.

Before beginning to support this assertion, it is important to address the foundational idea that underpins the comparison proposed: that the framework essentially organizes manifestations of the ways that artisans “structure visual forms of knowledge production and representation” and comparisons between corpora are facilitated by the framework in that they assess designs “linked by their structuring principles rather than their shared place in time or culture.” ¹¹ By engaging with ideas from the field of information studies, specifically visual epistemology, I have sought to produce a practical methodology which separates and organizes visual information in preparation for objective observation and comparison.

1.2 The Articella and its Component Texts

The Articella, at times referred to in scholarly discussion as the Ars medicine, is a collection of texts that by the third quarter of the twelfth century was widely adopted as the standard textbook of European medical curricula. A familiarity with its contents and the structure of their compilation relative to one another is valuable to the discussion that takes place in the following chapters, as the underlying structure of each text is meaningful to how scribes chose to arrange their contents on the page.

The Articella is composed of six texts whose order was largely canonized by the early twelfth century:¹²

- Johannitius’ Isagoge [ad Tegni Galieni]: A long-standing primer of medical theory that was used to teach introductory medicine since at least the late eleventh century and existed independently in manuscripts originating at Monte Cassino, the likely site of its translation from Arabic. Intended as a prologue to the Tegni, it communicates the structure and hierarchies of the elements of Galenic medicine in a format conducive to memorization by students. From its original production in Arabic to its continued Latin use, the Isagoge was intended to help practitioners understand the significantly more complex Tegni.¹³
- Galen’s Tegni: Although this text was incorporated into the composite Articella later than the other five texts, by 1150 its inclusion was standard, as was its

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¹² O’Boyle, The Art of Medicine, 84–86, 100.

¹³ O’Boyle, The Art of Medicine, 84.
placement as the second text, following the overview of its contents provided in the outline-like *Isagoge*. The *Tegni* is a notably complex and dense primer on medicine, despite its relative brevity, because it makes such extensive self-reference to Galen’s body of earlier writings; therefore, it was broadly not reproduced as an independent manuscript text without the accompaniment of other texts intended to elucidate its contents.

- Hippocrates’ *Aphorisms*: A collection of succinct statements intended to “encapsulate the wisdom of the medical art,” the *Aphorisms* was, as implied by its title, designed to be committed easily to memory. The contents are divided into seven categories which organize the pithy contents into conceptual groupings.

- Hippocrates’ *Prognostics*: A text intended to compliment the *Aphorisms*, the *Prognostics* focuses specifically on knowledge of how acute illnesses progress and can be treated, again structured in such a way to encourage memorization.

- Theophiles’ *Urines*: *Urines* categorizes human urine according to colour, consistency, odour, and other traits that it then links to medical conditions which are connected to specific areas of the body.

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• Philaretus’ Pulses: This text analyses variations in pulse, according to ten Galenic medicine types, and offers pithy medical explanations for why these pulse variants tend to occur. It is, like the Urines, intended as a diagnostic guide, and along with that text was translated from Greek to Latin during the first half of the 12th century.¹⁹

As teaching traditions at the universities developed, expanded versions of the Articella that incorporated commentary texts began to circulate and increased in popularity despite their significantly longer length, often adding an additional hundred folia to the brief and significantly less expensive to produce original compilation.²⁰ Referred to as the Ars commentata, this newer and substantially longer collection assembled, within a single manuscript, the older “classic” translations of the texts in the Articella with alternate translations of these same texts that were accompanied by expert commentaries.²¹ These commentaries were intended by their authors, who were medical teachers and experts, to elucidate the implications of both the contents of the original texts and the contradictions existing between these contents. Commentaries “represent novel solutions to new pedagogical needs that produced ‘an expanding canon augmented

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¹⁹ O’Boyle, The Art of Medicine, 92.
²⁰ O’Boyle, The Art of Medicine, 134–36.
²¹ O’Boyle, The Art of Medicine, 139.
disputatively’.” 22 The *Ars commentata* combined the uncommented portions of the *Articella* (Johannitius’ *Isagoge*, Theophilus’ *De urinis*, and Philaretus’ *De pulsibus*) with the original translated contents of the *Aphorisms*, *Tegni*, *Prognostica*, and *De regimine acutorum*, interspersed with relatively standardized commentaries on this latter group of texts.23

A leading scholar of the medieval university has stated that the material features of manuscripts of the new *Ars commentata* tend to share certain common design features; the scribes often…

> insert into the commentaries on [*Isagoge*, *Urines*, and *De pulsibus*] the corresponding passages of these texts as they appeared in the *Articella*. The texts of these three works were differentiated from their corresponding commentaries by being double-spaced and written in a larger point size.24

The print-centred language with which O’Boyle describes the script and line spacing that represented part of the design norms for the *Ars commentata* is awkward for this design discussion but does effectively convey to the non-medievalist reader the relative line spacing and script sizes involved.

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24 O’Boyle, *The Art of Medicine*, 139.
Examining manuscripts of the *Ars commentata*, particularly those originating in the late thirteenth century, reveals the process by which manuscript producers worked to create a material form for this textbook to best suit the needs of the evolving medical classroom in which it was used with increasing frequency. The shift to the *Ars commentata* accompanied significant and large-scale institutional changes that established a more involved administrative process and, in the medical faculties, a tendency to rely more heavily on studying commentaries to the core *Articella* texts rather than the works of the *auctores* themselves.  

An awareness of this institutional shift and its material consequences for page design is important in order to appreciate the connections between the design and use of the previous generation of *Articella* manuscripts.

### 1.3 The Context of Use: Scholasticism and the Early Universities

In order to contextualize the observations in the following chapters, it is crucial to understand the shared pressures that drove the designs of manuscripts across the four types of university faculty. Each faculty tended to develop its own unique solutions corresponding to the ways readers used texts in their field, but on whole shared tendencies developed that related to the practice of scholasticism more broadly. Understanding the historical context and the corresponding design features of manuscripts produced for use across the faculties is useful to the analysis of medical

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manuscripts because of this shared pressure—and because more scholarly work has been produced on the books of non-medical faculties.

Emerging from a heterogeneous landscape of independent schools teaching a variety of subjects including arts and grammar, both canon and civil law, and medicine, the first universities coalesced organically in locations where a sufficiently high density of scholars congregated around masters.26 The first institutions were established by collectives of students or faculty in these existing learning centres around 1200, although with regard to their legal organization and administrative structures, they remained both relatively informal and relatively underfunded.27 For chronological context, the first surviving self-recognizing written statutes produced by universities’ organizing institutions are dated from 1215–31 in Paris, from 1220 in Montpellier, and from the 1250s in Oxford, Cambridge, and Bologna.28 The first universities’ official seals appeared in 1246 in Paris and 1276 in Oxford, a development suggesting an increased sense of identity and anticipated longevity, and corresponding with the period during which new and lasting organizational structures within each faculty developed.29 As organized settings for intellectual instruction, early universities often varied in their structures, with arts,

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28 Verger, “Patterns,” 38.

29 Verger, “Patterns,” 38.
medicine, law, and theology found at some comprehensive universities, although at most schools there were only two or three curricula.\textsuperscript{30}

Each of these faculties had several fundamental texts associated with their instruction. Students studying medicine, canon law, civil law, theology, and in some cases Arts, were expected to acquire their own copies of each text.\textsuperscript{31} For example, students in Law were required to own and study the \textit{Decretum Gratiani}, the first university textbook, which collected canon law and standard commentaries on dense, highly-organized pages.\textsuperscript{32} It follows that this market produced by ever-increasing university standardization of classroom practices created a marked increase in demand for copies suitable for student use that were prepared in a quality and format that the university considered appropriate. It is worthwhile to consider the identities of students who attended and

\textsuperscript{30} Alfonso Maierù, \textit{University Training in Medieval Europe}, trans. D. N. Pryds, Education and Society in the Middle Ages and Renaissance 3 (Leiden: E. J. Brill, 1994), xii, xv, 74–76. The chapter “Bolognese Terminology in Medicine and Arts: \textit{Facultas} and \textit{Verificare}” (72–92), addresses the range of regional differences in organizational and lecture structures between universities across Europe in the thirteenth century and cautions against generalizations based on the structure and practices at the University of Paris and Oxford. Verger (“Patterns,” 42) points out that universities having all four faculties or curricula was unusual in the thirteenth century and for much of the fourteenth.


were required to obtain these manuscripts, because these students provided a body of inexpensive scribal labour to the commercial book production marketplace in which new manuscripts were copied and a second-hand trade flourished. In this case, students’ familiarity with the teaching format and medical contents may have exerted influence over the design of pages; exploring the evidence supporting this possibility is essential to understanding the material books they and other scribes produced.

Scholastic classroom practices across the university departments involved the development of iterative commentaries and a “common body of knowledge grounded on an authoritative canon of works” and “transmitted from masters to students in accordance with traditional rules of interpretation.” By starting with the detailed examination of a core text and the commentaries provided by previous generations of scholastic thinkers, lecturers and students alike were able to construct arguments that sought to identify and interrogate the differences and similarities between established texts as well as responses to them. After organizing the salient points in the texts in question according to a dialectical process, and then compiling these observations and arguments in dense text snippets called *sententiae*, scholars then sought to reconcile the two sides of the argument so that they would be in agreement. Using analysis of the specific words used by the *auctores* or authors, and relying on the rules of formal logic, scholars probed ambiguities and responded to *quaestiones*, key signposts in the

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33 Pollard, “The Pecia System,” 156.
34 O’Boyle, *The Art of Medicine*, 231.
35 O’Boyle, *The Art of Medicine*, x.
organization of scholastic texts. This process is at the heart of scholastic practice and was demonstrated regularly in university classrooms—and town squares, to the edification of students and other scholars. Both the methodology and the conclusions of these thinkers were taught through this approach. The method of passing on knowledge of both the scholastic method and the contents of texts was structured around lecturers performing the *lectio*, lectures based on texts and their commentaries, and examining *questiones*.

Scholastic teaching demanded students’ rapid consultation of disparate texts within a textbook like the *Articella* and significantly influenced the design of their pages and overall organization. Features such as red and blue paraph marks that break up the flow of densely-written text, unusually wide margins inviting the addition of comments, and segmented page spaces reflecting the distinctions between different sections of content reflect key features of the scholastic classroom experience. It is easier, for example, to quickly identify the section referred to in the *lectio* when the text is broken up into many pieces, particularly when the relationship between passages is reflected in their location on the page and in their respective sizes—original text by *auctores* was typically written in a larger hand. Similarly, these page structures, which also often include *signes-de-renvoi* or symbols that tie comments to relevant sections of main text, invite subsequent generations of glossing—the addition of sections of post-production script—conducted in dialogue with the text and its previous commentary. The exchange of ideas that these features facilitated is reflective of the priorities and features of scholasticism.
The following two chapters will examine variation and consistency in page design, as it appears in forty-eight copies of the Articella and thirty-two copies of the Ars commentata. Articella produced between 1200 and 1250. The two primary bodies of material evidence preserved in these manuscripts will each receive their own chapter:

- Chapter Two: evidence related to the process of designing and making the page, for example comparing the relative sizes of page elements such as margins and spaces intentionally left for adding notes, and the locations of these elements on the page.
- Chapter Three: evidence embedded in how scribes executing the elements of page design—choice of script style and quality, text size, and application of hypertext—which the structural page spaces such as margins and text columns guide into place.

The evidence preserved in how users responded to the page, such as post-production glosses, corrections, and annotations, will be addressed throughout, particularly when it highlights moments of divergence or conformity to the scribe’s vision for the manuscript’s design as it was inscribed on the page.
2. Design Evidence Preserved in Page Layouts

The first layer of material evidence that has been preserved in the design of manuscripts is the series of choices that the scribe makes during the process of ruling. These choices range from assigning the relative quantities of space that the core text and margins will occupy on each page, to guiding the size of script that will fill these spaces, and in some cases demarcating where navigational aids will be placed within the margins. During this stage, the scribe structures the information that will be written on the page in the subsequent steps, making reference to the needs of the individual user and to the design norms that shape all manuscripts made in the broader era and in the specific context of university commercial production.

2.1 Page Preparation Prior to the Scribe’s Intervention

In his study of thirteenth- and fourteenth-century accounts of parchment production and preparation, Michael Gullick demonstrates that a wide variety of qualities of parchment were available on the commercial market in which scribes producing manuscripts for university clients worked. Artisans participating in this market were conscious of the intended end use of specific grades of parchment, and in the thirteenth century,

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preparation of these parchment sheets was charged by parchment makers or their assistants separately to the charge for the material itself.\textsuperscript{37} This process, which included scraping, smoothing, and at times treating the surface with powdered minerals that change how the ink would behave on the page at the point when scribes began to write. Gullick writes that a variety of materials could be used for this treatment, including “pumice, sandrac (\textit{verniz, glassa} etc) and chalk” depending on the place of manufacture, the individual properties of the skin, and the quality—and thus, expense for the end purchaser of the manuscript—at which the parchment was being produced.\textsuperscript{38} All of these material steps preserve evidence regarding the manuscript’s anticipated use, which the scribe would have been aware of when purchasing parchment and then preparing the page to receive text.

Despite the foresight engaged by scribes in selecting materials prior to adding ruling, university manuscripts were produced under a set of shared pressures that affected the material process of their production. The competing urges to minimize expense on parchment, balanced with the desire to include sufficient space for annotation that enabled these comments to be placed near their relevant core text, in addition to the desire for portability, affected the end material result. In situations where compromise was required due to cost or availability, one at times finds marginal notes by the original

\textsuperscript{37} Gullick, “From Parchmenter to Scribe,” 149.

\textsuperscript{38} Gullick, “From Parchmenter to Scribe,” 148.
scribe criticizing the quality of the surface on which they are writing.\textsuperscript{39} Specifically, this type of annotation appeared with some frequency in manuscripts produced in university settings by scribes who were also students and whose audiences were themselves, in the context of a unique arrangement by which a portion of university manuscripts were produced. In a response to students’ need to acquire individual copies of texts required by their faculties, a market related to the general production of manuscripts developed which centred on the need of students to acquire copies of texts that conformed to the increasingly regulated expectations of instructors.\textsuperscript{40}

Although it did not operate in the first half of the thirteenth century, towards the end of the period discussed, the systematized \textit{pecia} system offered a cheaper and more efficient mode of production than visiting a shop and ordering a manuscript from a scribe. This process of production involved the copying of an exemplar text, generally rented from stationers, businessmen who organized the book trade in cities, one quire (a section of parchment folia) at a time by students. The same students also often offered inexpensive scribal labour in lower-end competition with established scribes, in addition to copying

\textsuperscript{39} Jean Destrez, \textit{La pecia dans les manuscrits universitaires du XIII\textsuperscript{e} et du XIV\textsuperscript{e} siècle} (Paris: Jacques Vautrain, 1935), 38, n. 1, cited in Gullick, “From Parchmenter to Scribe,” 148, n. 28.

\textsuperscript{40} Pollard, “The \textit{Pecia} System in the Medieval Universities,” 150. Pollard demonstrates that in most schools, Arts was taught orally, without a requirement for provisioning desks or individual student copies. The University of Paris, the most significant centre of learning during the thirteenth century, however, required students to obtain their own manuscripts. Therefore, Pollard’s observations regarding the \textit{pecia} system are relevant to this discussion as well as to observations about thirteenth-century university manuscripts in general.
texts for themselves. During the latter half of the thirteenth century, the pecia system of exemplar rental was so prolific that subsequent centuries would later be characterized by a decrease in the number of texts that were produced for classroom use due to the substantial second-hand market that developed based on the circulation of these manuscripts. The outcome for design and for the material evidence left behind in university manuscripts will be discussed below.

2.2 Design Norms and the Scholastic Era

Jennifer Weston eloquently describes the changed mindset of scribes practising in the context of scholastic educational practices, both before—during the twelfth century—and after the organization of the universities, which took place incrementally during the thirteenth century:

> The physical manuscript page was no longer sacred and untouchable, but instead it became a new type of workplace; a space where ideas could blossom, personal opinions could be expressed, and one could individually explore new understandings of ancient ideas and concepts.

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41 Pollard, “The Pecia System,” 156.
The shift in attitude that accompanied the rise of scholastic practice and the transition to a commercial marketplace for book production relates to what Kevin Kelly describes as a change in “distribution-and-display devices.” In this theory, outlined as part of a discussion on screen literacy in modern media, Kelly connects major alterations in the material forms through which individuals and societies interact with media, with alterations in the dominant intellectual modus through which they engage with the creation and production of new ideas. R. W. Southern describes how the pursuit of knowledge became increasingly individualized in focus in the context of scholasticism.

This shift accompanied a movement toward utilizing texts for reference to support the interpersonal, competitive, and quick-witted scholastic exercises of lectio, quaestio, disputatio, and dialectic.

The effect that scholasticism had on manuscript design has been extensively explored by Malcolm Parkes; he describes it thus:

[Scholasticism] was a process of study which involved a more ratiocinative scrutiny of the text and consultation for reference purposes... [it] required different kinds of presentation of the texts [compared to the monastic practices which previously dominated literate society], and this is reflected in changes in features of layout and in the provision of apparatus for the academic reader...


45 Southern, “The Schools of Paris and the School of Chartres,” 115.
developments in *mise-en-page* were bound up with developments in methods of scholarship and changes in attitude to study.46

Paradigm shifts from one form of distribution-and-display device to another—and Parkes would almost certainly argue that the significant structural design shifts that accompanied scholasticism would qualify—are reflected in the development of new design norms which shape subsequent media.

Like modern textbooks, which tend to feature extended marginal spaces for annotation and significant quantities of subdivision of the page and uses of colour and dynamic design, medieval books that were made for use by university students tended to have layouts that reflected both their quotidian and intellectual uses, as well as the user’s needs as understood by the scribe responsible for the book’s production.47 At times, due to the operation of the *pecia* system, these scribes were one and the same as the intended user of the text. Scribes tended, on average, to leave approximately half of the area on each


47 Kwakkel, “Decoding the Material Book,” 60–76.
page unwritten, but university manuscripts often diverged dramatically from this norm by assigning a significantly greater quantity of space to the margin.48

Scribes producing manuscripts designed in response to the needs of participants in the scholastic method, whether for themselves or for hire, would have been aware of design conventions established during the twelfth century. This is demonstrated by the presence of at least some features supporting non-sequential reading practices in manuscript copies of university texts produced at every level of quality and complexity, from student-made copies to elegant works intended to be retained by patrons associated with the royal houses and church institutions that both sponsored and would go on to employ some of the students participating in university education, including those studying in the medical faculties.49


2.3 Mapping Page Design

Figure 2.1 Highlights from Paris, Bibliothèque nationale, Latin, 18500. From left, marginal space, commentary text, running title (above), core text (below), litterae notabiliores.
2.4 The Relative Sizes of Page Elements and their Consequences

The material evidence preserved in manuscripts originating from this context indicate that scribes prioritized large margins over both the economical use of parchment and the enlargement of core text. This decision, which had economic drawbacks in terms of how much parchment was required to produce each manuscript, reflects their consciousness of individuals’ contributions to the disputatio process. The preference for creating larger marginal spaces was derived from the scribes’ understanding of the way in which readers would seek to engage individualistically and dialogically with the text in the context of a university. While manuscripts produced during the “long 12th century”—the period 1075–1225—averaged 47 to 50% of each page devoted to margins, the thirteenth-century medical manuscripts comprising the corpus presently discussed feature an average of 65% marginal space.50

By tending to prefer to sacrifice the ability to fit more contents on the page in favour of providing scholars with wide, empty margins, scribes anticipated the incorporation of additional glosses by readers. At the stage of page preparation, the scribe laid out the maximum proportion of each page that could be used for lectio notes and reference aids,

50 As discussed in Chapter 1, the measurements taken on this corpus of manuscripts represents 75% of the Articella copies identified from the period 1200–1250 and 68% of those identified from 1250–1300. In order to take proportional measurements, at least a small sample of folia from the manuscript must have been digitized in some way. In most cases, these manuscripts are in part presented online in digital collections. The total corpus of manuscripts is derived from O’Boyle, Thirteenth- and Fourteenth-Century Copies of the Ars Medicine, vi–viii.
and thus circumscribed the contributions that the reader could make to the dialogue with the \textit{auctores} original works. These spaces could be subdivided—see the following section for an analysis of an \textit{Ars commentata} manuscript that features extensive pre-production division of marginal space—or could be left open, inviting annotation.

In considering the proportion of spaces devoted to main text and to glosses, it is helpful to also consider the actual size of the page on which these divisions take place. The overall size of the manuscript has a significant impact on the range of options that the scribe has when ruling the page, as well as on the uses that are conveniently available to the user. To clarify this point it is helpful to compare two medical manuscripts: Florence, Biblioteca Medicea-Laurenziana, MS Plut. 73.28 and British Library, Harley MS 3140.

Florence, 73.28 is a small manuscript in terms of its footprint, measuring only 145 x 110 mm in size. It has been ruled for one column of main text and surrounded by margins representing 45\% of the square millimetres available for use by the scribe. This manuscript is unusually small in the context of the corpus discussed, among three of the smallest. It was produced between 1200 and 1230, in the final years of the “long 12\textsuperscript{th} century,” and reflects the page design sensibilities of this era. The main text-marginal space division fits into Erik Kwakkel’s data range for the quarter century, and the single column layout is in keeping with contemporary manuscripts from the Arts and Medicine faculties.\footnote{Kwakkel, “The Margin as Editorial Space,” 323.} The resulting manuscript is clearly designed to facilitate portability—the
physical size would fit in a pocket—and it is not unreasonable to surmise that it was also intended for handheld use.

Figure 2.2 Comparison of the page sizes of British Library, Harley MS 3140, fol. 3r (*Ars commentata*) (left), with Florence, Biblioteca Medicea-Laurenziana, Plut. 73.28, fol. 23r (*Articella*) (right). Pages are presented to scale.

In comparison, the design of British Library, Harley 3140, which was produced in the latter half of the thirteenth century and contains a remarkably complete set of medical
treatises for the period, implies a distinctly different intended use. While it is apparent that the text was intended to be used in a scholastic setting and the manuscript was also produced with only a single column of main text, the substantially larger overall size of 318 x 215 mm implies desk-top use. The use of desks was standard in many university settings, so it is predictable that the larger size of this manuscript would be appropriate for use in a classroom setting with desks.\footnote{Pollard, “The Pecia System,” 150.} The increased page size, which is in keeping with the majority of surviving Articella and Ars commentata manuscripts from the thirteenth century, invites the scribe to assign 71% of the page to marginal spaces, 50% of which is located on the left and right sides of the page. While this is a substantial proportion in the context of non-university manuscripts, it is not out of the norm for those produced for this setting.

### 2.5 The Placement of Page Elements and their Consequences

The location of the major blocks of space on the page contributes to their usefulness for university users, particularly in terms of how the main text block is divided up into columns and how the marginal space is arranged and, later in the thirteenth century, divided into sub-sections that facilitate organized annotation.

One feature common to many manuscripts, including those originating in university settings, is a text block that does not vary substantially in size from section to section. This is due to a combination of scribal norms and the practical considerations involved
in ruling.\textsuperscript{53} This text block space, which is shaded in red in the example figures throughout this chapter, is in some cases subdivided into two or more vertical columns. Generally, the text block is limited to a maximum of two columns of main text, and the surrounding space is in some cases vertically divided into up to four surrounding columns intended to contain commentary. In many manuscripts which do not incorporate an established commentary text, these central columns are ruled with evenly spaced lines intended to facilitate consistent entry of written contents by the scribe. A typical example of a basic execution of this column structure is the mid-thirteenth-century \textit{Articella} manuscript Reims, Bibliothèque municipale, MS 1001 (I.699) [\textit{recte}: MS 1001 (I. 692)] (\textit{olim}: Reims, Chapitre cathédral, J, ord. 4, no 8). With its contents arranged into two columns intended to receive rather tiny script, the manuscript also features substantially increased marginal spaces—65\% of each folium. Originating before the compilation of the \textit{Ars commentata}, this \textit{Articella} does not directly incorporate any commentaries, instead presenting the key Galenic texts with ample space for the addition of post-production annotation, which some subsequent users took advantage of.

Many university manuscripts, though more commonly those in the legal and theological traditions with more complex and longstanding commentary traditions, feature more

complex divisions of column space within the text block. The placement of sections in these designs is more complex and labour-intensive, with columns set up to receive both main text and core text at varying widths and heights within each columnar zone. Christopher de Hamel utilizes terminology to derived from thirteenth-century booklists to distinguish between the various executions of this design: “continuous layout,” “intercut (intercisum) layout,” and “lemmatised (catena) layout.” Scribes first ruled out a frame for the entire page, divided it into columns, applied a consistent ruling pattern, and then filled in the commentary portions. As is apparent from the examples preserved of unfinished manuscripts where the scribe has neglected to go back and fill in the main text rectangles, scribes then left spaces behind for main text to be inscribed at a height of two lines, visually distinguishing it from the surrounding commentary. In considering the added complexity and labour implications of this approach to sizing and placing page elements, it is apparent that commentary was the priority for scribes producing manuscripts for scholastic audiences. The contents of commentaries, which were


55 de Hamel, Glossed Books of the Bible, 21.


57 Smith, The Glossa Ordinaria, 7–9; An example of one of these complex layout approaches applied to a university-produced glossed Bible can be found in Durham Cathedral Library, MS A.II.7, in which dramatically varying the height of the main text excerpts improves the chances of each section of gloss sitting beside its relevant scripture.
produced by previous generations of eminent scholastic masters, offered ammunition for *quaestio* and *disputatio* debates. Therefore, the investment, in labour, effort, and parchment, devoted to these commentaries reflected the priorities of the purchasers of these manuscripts.

Figure 2.3 Paris, Bibliothèque nationale de France, Latin 6869, fol. 44r (*Ars commentata*). Sections of main text are highlighted in red boxes, and the major ruling of the page, not including individual text lines, is highlighted in blue.

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Rather than investing the additional intellectual and manual labour common to glossed Bibles originating in the scholastic study of theology beginning in the twelfth century, a simpler and less time- and skill-intensive approach tended to prevail in the context of university commercial production. When looking at medical manuscripts from the early thirteenth century, a simpler layout is more typical in keeping with the inherited scholasticism-influenced norms of the long twelfth century. However, as the century progressed and the *Ars commentata* was increasingly standardized in terms of its design, a more complex format that balanced ease of production and ease of reference appeared. The central columns, frequently numbering two or three, could simply be further subdivided into horizontally distinct sections, varying alternating sections of content in vertical height from column to column based on the proportion of main text to established commentary. The manuscript example depicted, Paris, Bibliothèque nationale de France, Latin 6869, an early *Ars commentata*, follows this model.

The design approach depicted in Paris, BnF, Latin 6869 was appealing for multiple reasons. For the scribe, it combined ease of ruling — the full two-column layout was ruled without reference to subdividing the text — with maximum impact for the end user. As is apparent in the above figure, all of the intellectual labour required to create easily

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59 Erik Kwakkel, “The Margin as Editorial Space,” 323–24. Two thirteenth-century examples of this tendency are Clermont-Ferrand, Bibliothèque municipale, MS 214 and Cambridge, Corpus Christi College, MS 364, both manuscripts with approximately 60% marginal space, a figure wholly within the norm for university productions; both of these manuscripts feature simple single-column designs with increased, but not subdivided, marginal spaces.
Navigable text took place during the process of writing out the script, as will be more fully addressed in the following chapter. Sections of main text were written in larger script that takes advantage of the full line height and were spaced with a full line between text lines to enable corrective interlinear annotation.

Not only did this layout approach allow the user to effectively distinguish between the main text and the standardized commentary, the scribe has alternated core text and primary gloss in a continuous layout and has chosen to distinguish between the two by writing the core text across two lines. This is appropriate to the proportion of each type of text and reflects the hierarchy between the two types of material. Just as the core text is a larger size than the gloss, its divisions are marked with initials in a secondary display script, an approach which emphasizes its relationship to the primary gloss with its initials in a tertiary display script. At their first glance, a reader can see the structure of both page and information, which the scribe achieved without resorting to any complex techniques.

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60 Malcolm B. Parkes defines the hierarchy of scripts: “Twelfth-century scribes had inherited a hierarchy of scripts, which they could employ for different purposes alongside that used for the text: as primary display script (for titles of works, and for headings of major divisions within a text), as secondary display script (for the opening words of a major division of the text), and as tertiary display script (for litterae notabiliiores within the text itself)” (“Layout and Presentation of the Text,” in The Cambridge History of the Book in Britain, ed. Nigel Morgan and Rodney M. Thomson (Cambridge: Cambridge University Press, 2008), 55–74 at 64).
In some cases from the latter half of the thirteenth century, including that of Paris, BnF, Latin 6869, scribes also divided the marginal space in an effort to encourage users to organize their reflections and annotations on the text. Sectioning the margins into two tall, narrow columns at the time of ruling indicated an awareness of the increasingly common practice of sorting commentary into ontological categories for easier reference. Enabled by increased marginal spaces, the increasing subdivision of page space allowed the scribe to both organize the main text and the established commentary texts, but also to anticipate the intellectual process through which the user—and potentially subsequent users—would add invaluable additions to the page. Further discussion of this approach will continue in the following chapter, which addresses the impact of specific ways in which scribes filled the page spaces laid out during the ruling and design portion of production.
3. Evidence Preserved in the Format of Page Contents

The second layer of material evidence embedded in the design of manuscripts and preserved on their surviving pages is the decisions that the scribe makes when filling in, with script, decoration, and symbols, the spaces delineated during the ruling process. From choosing a size and quality to write text in—within the constraints of the ruled line heights determined in the previous stage—to locating reading and navigational aids on the page that enable reference use, these choices are integral to the user’s experience of the manuscript.

3.1 The Roles of the Scribe

It is first important to establish the relationship between the ruling, copying, and rubrication stages of manuscript production within the thirteenth-century university context, because these roles are often discussed as separate tasks—but they were not necessarily carried out by separate individuals. In a meaningful discussion of design and intent, it is imperative to consider the designer. In many cases, particularly in the case of lower-end manuscripts without elaborate painted illustrations, the design of the overall manuscript represents the vision of only two individuals: the scribe and the purchaser.61

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61 Only one manuscript in the corpus discussed in this thesis contains such illustrations, and documentary evidence suggests that this manuscript, Paris, Bibliothèque nationale, Latin 6868, was produced for a wealthy client with sponsored funding. Whilst many university attendees
As described in two proscriptive lists originally composed by Alexander Nequam in the late twelfth century, the scribe’s tasks tended to begin with final finishing of the parchment sourced from the parchment-maker, and conclude with their writing out the majority of main text and pre-planned commentary. As Nequam writes:

The copyist, who is commonly called the scribe, shall have a chair with projecting arms for holding the board on which the choir of parchment is to be placed… The margins of the quire shall be marked on either side with an awl in even measure so that by the aid of a rule the lines may be more surely drawn without mistake. If in writing any erasure or crossing out occurs, the writing shall not be cancelled but scraped off.62

As this contemporary description suggests, the previous chapter’s discussion of laying out the page leaves off halfway through the scribe’s work, and both of these halves of the manuscript design process tended to be carried out by the hand of, and according to the conception of, the same individual. First, the scribe committed to designing, sizing, and assigning page zones to the layout which would then be replicated through the ruling

sought employment with the Church or moneyed families, particularly as medical clients, they were in this faculty less likely to originate personally from such a background.

62 Thompson, “Technology of Production,” 79, citing the translation from the Latin original as presented in U. T. Holmes, Daily Living in the Twelfth Century Based on Observations of Alexander Neckam in London and Paris (Madison: University of Wisconsin Press, 1952), 278–79. As Thompson describes, the quote from Nequam’s original list is preserved solely in Cambridge, Gonville and Caius College, MS 385/605.
process throughout the quire, and often throughout the entire “production unit” or individual text within a compiled book. Following this step, they were then responsible for following the guides on the page that they laid out, fitting the contents of each text copied into the spaces that they laid out, and adding navigational aids between sections and within the margins. It is this latter stage with which we are presently concerned. The page design for each individual text tended to be constant within itself, and variations on both design and the way in which the page was filled at times vary the reader’s perception of the texts as distinguishable both visually and according to their respective structures.

In order for clarity around the composition of the manuscripts discussed, it is important, in a discussion of what roles the scribe performed and the individuals responsible for each portion of a manuscript, to address the historical point that numerous university medical manuscripts are composed of multiple production units. This observation is evident in that these manuscripts contained collections of short individual texts that could have been rented by-the-quire in the context of the pecia system or its less formally organized market alternative; in other cases, multiple manuscripts produced by different individuals were compiled after production in the extensive resale market. Kwakkel


64 Rouse and Rouse, “The Book Trade at the University of Paris, 1250–1350,” 268–71. The relative paucity of manuscripts in my corpus bearing the characteristic marginal marks associated with suggests that formal pecia practises were more common in the other faculties, which featured
coins the English term “production units” to describe “groups of quires that formed a material unit at the time of production. Such quires were copied ‘in one go’ by either one or more scribes.” Each production unit, in the case of university medical manuscripts, tended to have a single copyist, as suggested by palaeographic consistency within individual texts. The evidence for this assertion lies in both the consistent ruling patterns within each text copied, and the presence of scribes’ hands remaining the same in each section. Whilst the corpus being discussed contains numerous composite manuscripts assembled proximally to the time of creation, these production units are each clearly produced in whole by a single scribe. One manuscript that is a valuable example of this practice, as well as of the effect of the scribe varying their use of script to differing effects between individual texts, is Durham, Cathedral Library, MS C.IV.4, a composite manuscript containing *Ars commentata* texts but which has lost its initial copy of the *Isagoge*; it will be discussed in greater detail below.

Examining the tasks for which the scribe would be responsible is important, particularly because the case of university manuscripts tended to yield a less complicated workplace of tasks than the production of an ornate religious manuscript intended for a royal client. Not only were individual scribes expected to design, rule, and copy text onto the manuscript page, they also added the more rudimentary forms of page decoration that played an important role in enabling the user to navigate the book for reference purposes.

Rubrication, the addition of red ink to the page for emphasis, and simple decoration, in one or more colours—usually red and blue—was often carried out in thirteenth-century university manuscripts by the main scribe. This assertion is supported by the expected provisioning of red ink by scribes in a chronologically-adjacent context: “the scribe might be responsible for at least the minor decoration... red was always the second colour after black, and is almost invariably found in even the plainest books.”

In many cases, as funds were limited and secondhand copies difficult to obtain in the initial years of the university’s existence, the scribe was also the medical student, and would have similarly conducted rubrication themselves. As depicted in Figure 3.1, both red and blue inks were commonly used in drawing and writing navigation-aid-dense university page designs as well as for diagrammatic illustrations that occasionally accompanied the text. As both of these tools for enhancing visual distinctions were implemented in this production context by the same individual, their appearance is reflective of the scribe’s initial design and of the ways they were able to effect it. Additionally, this feature was ubiquitous: no manuscript in the corpus of surviving Articella copies is without, at minimum, the presence of red accents breaking up the flow of the text.

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67 Thompson, “Technology of Production,” 8.
68 O’Boyle, The Art of Medicine, 158.
69 See the data presented in section 3.4 for further detail.
3.2 Design Norms and the Scholastic Era

It is next essential to address the design norms relevant to the “filling the page” stage of manuscript design, in order to contextualize the subsequent examples of manuscripts whose design reflects scribes’ anticipation of the needs of their university clientele. Beyond the expanded margins and placement of specific page areas highlighted in the previous chapter, the design norms common to thirteenth-century manuscripts produced for use in scholastic milieus include red and blue highlights implemented with coloured ink. These highlights were intended to mark breaks in the text and the hierarchical structure of sections, variation of script sizes and styles to emphasize the differences between sections of original and commentary content, and the highlighting of key sections of text with red accents or underlines. This assortment of features is common to the majority of scholastic manuscripts, not only those from medical faculties.

Understanding the intended implications of these design features requires an understanding of the way that the intellectual contents of scholastic texts were structured. Reading and reference aids such as these were intended to reflect the ordinatio and compilatio of the information contained in the manuscript. Ordinatio is defined as the formal structure of a written work that is arranged in a manner that reflects the “principles of order inherent in [the medical] branch of knowledge” each of which has “its own appropriate mode of procedure.” Compilatio, its complement, is the technique of laying out information in a way that reflects the organization of that information’s

contents and supports navigation for the user; although "compilation" was initially implemented in simpler forms in legal and theological texts from the twelfth century, the sophistication of university manuscripts’ *compilatio* was a definite advancement. In the thirteenth century, compilation took place at the hands of an individual referred to as the compiler, who was the original source of the design of page contents that was then implemented by each scribe with adaptations reflecting the individual user’s needs.

The *ordinatio* of each edition of a text formed the basis of scribes’ arrangement of information on each page, and tended to incorporate paratextual elements such as *litterae notabiliiores*, running titles, pagination, and *signes-de-renvoi*, which guided the user—who relied on these features as reference tools rather than simply reading the text—in their navigation of the book. *Compilatio* is introduced at this point in the examination of medieval university manuscript design because it tended to only have a significant influence on the ways that text and paratext were input within the preset columnar and marginal spaces that were established during the previous phase of page design. Appreciating the intellectual context that scholastic *ordinatio* had for the *compilatio* of university manuscripts is necessary to understanding why each modification of the

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71 Parkes, “The Influence of the Concepts of *Ordinatio* and *Compilatio*,” 127.

72 These terms will be defined with visual examples in section 3.3. Jacqueline Hamesse, “The Scholastic Model of Reading,” in *A History of Reading in the West*, ed. Guglielmo Cavallo and Roger Chartier, trans. Lydia G. Cochrane, Studies in Print Culture and the Book (Amherst: University of Massachusetts Press, 1995), 103.
textual elements of page design had such significance, with reference both to the design norms at play and to the individual user experience.
3.3 Mapping the Design of Page Contents

Figure 3.1 Clermont-Ferrand, Bibliothèque municipale, MS 213 (Articella), fol. 4v. 
*Litterae notabiliores* are highlighted in red. An example of *signes-de-renvoi* is highlighted in blue, with the two symbols connected by a dotted arrow.
There are a variety of manuscript design elements that were first assigned locations and sizes, and then within those spaces they were added to the page immediately following the inscription of the majority of the text. As in the previous chapter, as I introduce the terms referring to these features, I will present examples in situ on the manuscript page in order to provide visual context. Whilst many of these features have corresponding print counterparts and are discussed in contemporary visual analysis of page design, their handwritten predecessors possessed their own unique and relevant features.

For example, litterae notabiliore are “more noticeable letters” added during the rubrication stage in order to attract the reader’s eye and enable them to easily recognize the distinctions between sections of text.\textsuperscript{73} Frequently executed using red and blue ink, as discussed above, these letters tended to emphasize the opening letter of each structural section of a text and were often rendered in a larger size, spanning multiple lines or featuring added decoration that caught the eye of the user scanning a page for particularly sought-after information. In the above figure, these features are highlighted in red. In medical manuscripts, as opposed to those from the law and theology faculties, these letters tend to be simpler and less ornate, with one possible explanation being that there were significantly more section-breaks demanding litterae and paraph marks in the concise medical texts.

Flourishing, which ranged in complexity widely based on the level of effort and financial outlay required, is the addition of delicate lines—in university manuscripts these are largely in red and blue ink—to the marginal spaces of the page. This practice was generally executed immediately adjacent to the text block and, in examples that also feature expanded margins—including all but one manuscript in this corpus which features any flourishing—in such a way as to only minimally invade the space intended for marginal comment.74 Flourishing was less of a navigational aid than an ornamental feature that was part of the standard design norms in the thirteenth century, but its presence at the beginning of individual texts or major sections is immediately eye-catching on paging quickly through each manuscript.

Running titles, also called running heads, are the predecessor to the contemporary headers found in print books which list information indicating which section the content on the page sits within.75 The letters composing the running title were often painted in using red and/or blue ink during rubrication, and by the time university manuscripts were in production, it was normative to split the header information across the two sides of each page opening.76 As in modern textbooks, the information in the running title

74 Thompson, “Technology of Production,” 10. The anomalous manuscript is Oxford, Bodleian Library, Auct. F. 5. 30 (2753), which has more elaborate flourishing than most Articella manuscripts, and in some cases, such as fol. 4 (which has been digitized), it expands to fill marginal regions.

75 Thompson, “Technology of Production,” 6.

76 Erik Kwakkel, Books Before Print, Medieval Media and Culture (Leeds: ARC Humanities Press, 2018), 16.
helped the user navigate to the appropriate section, particularly in the case of books like the *Articella* and *Ars commentate*, which were by definition compilations of individual brief texts that were often copied tightly together, as evidenced by the contents of my corpus.

Paraph marks, visually related to *litterae notabiliores* and likewise executed during the rubrication phase, complimented the results of division between main text and commentary within the text block. These small paragraph-symbol-like glyphs, executed cheaply in red or more commonly in alternating red and blue, helped university readers to rapidly distinguish between disparate segments of text that in a modern book would be broken up into multiple lines. A convention likely borne of the desire to confine the contents of a text to as few pages as possible whilst allowing for easy reference during lecture, the paraph mark is present in all manuscripts within the thirteenth-century university medical manuscript corpus and was the most basic form of reading aid.  

*Signes-de-renvoi*, also known as tie marks, represent the most intellectually labour-intensive page design element at the scribe’s disposal. The forefather of the contemporary footnote, *signes-de-renvoi* connect locations within the main or commentary texts with notes added by the scribe in the marginal spaces. At times, in cases where the original commentary was added in surrounding columns; this version of *signes-de-renvoi* was

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78 See chapter 4 of Kwakkel, *Books Before Print*, for an eloquent discussion of footnotes in medieval manuscripts.
commonly implemented in thirteenth-century legal and theological university manuscripts where a frame of commentary was the design norm. In other cases, the *signes-de-renvoi* were added by a later reader who inscribed their own commentary contents, often from another exemplar or tradition, and used these symbols, inserted between lines of main text, to intellectually and spatially link each comment to its corresponding point of origin. This practice enabled maximal use of the designated expanded margins whilst allowing the information within to remain organized.

### 3.4 Manipulation of Script and its Consequences

Scribes have a fluid and multifaceted range of ways to modulate the output of their pen and guide the reader’s navigation of the often-crowded textual spaces on the page. This is one of the simplest ways that a scribe could improve a reader’s navigation of complex material. These techniques could be employed to signal the relative importance or authority of respective texts, to infuse space into the compact spaces within the text block, and to draw attention to intellectual and spatial boundaries between separate text sections and reflecting the *compilatio* of the manuscript. In the case of colour differences, the scribe may not have added the rubricated or decorative elements themselves, although as discussed these were often executed by the main scribe in the case of

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80 See a particularly fine example of use of space with *signes-de-renvoi* added by a second scribe in Saint-Omer, Bibliothèque municipale, MS 0476, a thoroughly-glossed copy of the *Decretum Gratiani*. 
university materials. However, their inclusion required intent, and therefore required
design. This intent is visible in the spaces left unwritten and sized for these coloured
elements, such as running titles framed out, the shape of paraph marks jotted in, or
squares left blank for *litterae notabiliores* that were never added.
Figure 3.2 Close-up of two examples of script at differing scales and levels of precision, as found in Clermont-Ferrand, Bibliothèque municipale, MS 214, fol. 16r (Articella) and in Florence, Biblioteca Medicea-Laurenziana, Plut. 73.18, fol. 34r (Articella).

The size of the text on a page, set within the confines of the ruling executed in the previous design stage, could vary substantially depending on how the scribe chose to fill that
space. Taller letters that occupied a greater proportion of the line height created difficulties for the manuscript’s user when adding the customary lecture commentary. Further, they tended to cause either the overall number of folia required to produce the manuscript to be higher, or the physical page size to be larger. Either result increased the overall cost of the manuscript, so a balancing act was necessary between producing a text so dense that it was difficult to quickly read and that impeded annotation, and exceeding the limited resources of buyers.

The way that scribes managed this balance in each manuscript reveals something about its particular purchaser’s priority; in the case of the particularly small and thick pocket-sized Clermont-Ferrand, Bibliothèque municipale, MS 214, the scribe writes in a moderate and readily legible size, but chooses to use extensive abbreviations to save space on each line. This practice was common in lower-end university manuscripts, particularly one like Clermont-Ferrand, 213, which from its size and portability appears to have been intended for consultation in one hand. The logical extension of its dimensions and design suggest a user who was very familiar with the material—enough that they could quickly consult and read the text with an unusually high frequency of abbreviation—and who did not need extensive marginal space to inscribe the great detail of classroom commentary. In contrast, at the other end of the textual size range is

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81 I characterize this manuscript as lower quality due to its minimal decoration, heavy-handed rubrication that often veers wildly off the ruling and occupies substantially more space than the page design allotted to it, and its small size combined with its lower grade of frequently-greasy and pore-speckled parchment.
Florence, Biblioteca Medicea-Laurenziana, Plut. 73.18; with its significantly larger page size it was clearly intended for desk-top use, and the extremely dense, neat script suggests it was intended for more attentive consultation or for reference by students or teachers, or perhaps as a library exemplar for copying, judging from its orderly appearance and lack of annotation despite the substantial margins.

Figure 3.3 Paris, Bibliothèque nationale de France, Latin 16178, fol. 131r (Ars commentata). Excerpt highlights the variation in size of script between core text and commentary sections within a single column.

Scribes did not only make use of modulating the overall size of the text. The usefulness of varying multiple script sizes within spaces on a single page is also immediately evident in the Ars commentata preserved at Paris, BnF, Latin 16178. Just as this manuscript’s scribe
varies the size of page spaces between sections, particularly in the context of the latter portion of the manuscript, in which the scribe has added a third column of text, producing a very crowded page. They have alternated core text and primary gloss in a continuous layout and have chosen to distinguish between the two by writing the core text across two lines. This is appropriate to the proportion of each type of text and reflects the hierarchy between the two types of material. At first glance, a reader can see the structure of both page and information, which the scribe achieved without resorting to any complex techniques.

This technique was easily implemented entirely within the writing stage of the page design; by writing the main text in larger letters that completely fill each ruled line, and then leaving a blank line in-between each of these lines, the scribe could produce a much bolder text without additional ruling labour. As an added benefit, this choice allowed the user to easily annotate between the lines of core text, adding further layers of commentary. By alternating these snippets of core text with sections of established commentary written in a regular single-line height and occupying one-half to two-thirds of each line with none left blank between, visual and thus hierarchical differences between these separate texts were readily established. In this way, the relatively-standard layout for the *Ars commentata* was formed. Simple to execute with minimal pre-planning, this page design was easy for students to replicate if writing their own manuscript copies. Additionally, it minimized the confusion inherent to associating sections of commentary with their portions of main text, and for the most part was preferred in the medical faculty over *signes-de-renvoi*. 
Litterae notabiliores were a helpful tool for scribes to guide navigation of densely-written texts, particularly for distinguishing between individual texts in a compilation like the Articella. For example, in the atypical Ars commentata at Durham Cathedral Library MS C.IV.4, the beginnings of some texts are highlighted by the inclusion of larger or more complex litterae notabiliores, making them easier to locate with ease. This was a simple technique used frequently in early Articella and Ars commentata copies that did not require running titles due to their brevity. Each text within the collection is structured somewhat differently to the next, yet as a unifying approach the scribe has chosen to rely, across the entire manuscript, on litterae notabiliores in alternating red and blue ink to demarcate paragraphs; this approach was typical for university manuscripts of shorter length. These quickly-inked additions break up an otherwise homogenous flow of text which is written in a relatively small hand (particularly in the case of booklet (III), with 56–58 lines per 234 mm-tall column).

Whilst litterae notabiliores contribute to structuring the text according to its ordinatio, the pops of colour allow for easier rapid browsing of otherwise densely written and enabled users in their reference goals. Similarly, in the instances of text containing a list of discrete pieces of information, the scribe punctuates these phrases with coloured capitals as well as rubricated paraph marks. This draws attention to their contents when rapidly paging through the manuscript, and enables easy differentiation between sections within the text block on the individual page. This approach is common to all manuscripts within the corpus, to varying degrees of complexity and skill corresponding to the intended use or user.
The hierarchy of scripts reflected in the three levels of *litterae notabiliores* included throughout the manuscript is the primary aid used to reflect the content structure in Durham, C.IV.4. 82 The relative size and complexity of the coloured initials that demarcate each passage communicated the relative importance of divisions within otherwise small, black-coloured, homogeneous writing and offered hints at the *ordinatio* of each medical text. 83 By devoting their budget of time and cost to emphasizing the structure of each text with such pervasive yet modest decoration, the scribe of C.IV.4 reveals this aspect of guiding the reader’s experience to be their priority.

### 3.5 Navigational Aids and their Consequences

In university medical manuscripts, in contrast to those from the legal and theological faculties, the addition of navigational aids such as running titles and pagination, as well as more complex formats like indices, were relatively uncommon. They are more frequently included in copies of the *Ars medicine*, which generally ran from 60 to 100 folia, and therefore required more complex means of finding the desired section of text. Few *Ars medicine* manuscripts were produced as composite manuscripts unless the whole was divided into two halves—the *Articella* texts followed by a separate portion of associated texts taught during the latter years of the thirteenth century. Therefore, their design was

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approached more frequently as a whole, with the attendant navigation tools such as simple running titles. Paris, BnF, Latin 16178 is once again an excellent example of the typical use of running titles to allow users to identify which text they are consulting and move from text to text with ease. This practice reinforces the idea of the textbook as something that was consulted, rather than read from cover to cover, and connects back to the idea of compilatio as a tool for reference in keeping with scholastic practice. Whilst the addition of running titles produced additional work during the rubrication phase, their presence indicates that their usefulness was regarded as significant to the university setting.

From the running title, which was conceived of as a tool for navigating the book as a whole, to the signes-de-renvoi, navigational aids pervaded the university medical manuscript on both macro and micro levels. One illuminating manuscript demonstrating effective use of tie marks in both commentary and overall manuscript organization is Paris, Bibliothèque nationale de France, Latin 16176. This late thirteenth-century manuscript features the five classic texts copied out in one production unit and followed by two robust production units containing sets of supplementary texts, each of which is also copied continuously and which were later assembled by a purchaser. Despite being composed of three production units, the manuscript features standard tie marks that proscribe an envisioned order in which the units would be assembled, removing the

necessity for all to be purchased at the same moment. These tie marks are distinct from catchwords used to guide quire assembly; as such, they reflect a consciousness of the tendency for university medical manuscripts to be composite in nature.

Like Paris, Bibliothèque nationale de France, Latin 16176, Durham, C.IV.4 was produced in three sections for reduced production cost at any single moment in time and intended, as is clear from the practical aspects of its dimensions, for easy portability. The scribe responsible for the design of Durham, C.IV.4 did not invest significant labour in adding aids to identifying specific texts within the overall manuscript. A plausible explanation for this is its composite structure: the manuscript was assembled from three booklets, produced by a common scribe, which were originally intended for individual consultation. Therefore, the user would have had a maximum of three separate texts, as in the case of booklet (I), to navigate when searching for their desired title. The lack of both running titles and noteworthy decoration marking the beginning of each text

85 O’Boyle, The Art of Medicine, 178.


suggests a reader with significant familiarity with the materials; the titles present were added in the fifteenth century, and the *incipit* of each section is not emphasized.\(^88\)

As O’Boyle demonstrates in his analysis of both uncommented and commented *Articella* manuscripts,

> to the untrained modern eye, a page of text may seem relatively untouched. A few brief marginal comments, a few siglla, some interlinear glosses, the odd emendation and some gibbets here and there, all of which have been inserted in a minute hand in faded ink, are easily dismissed.\(^89\)

Providing spaces in the *mise-en-page* for these delicate additions was simple but required scribes to possess the awareness to do so—and the broad omission of these types of referential symbols from the scribe’s personal contributions is not an oversight. Instead, the practice is reflective of the participatory classroom methodology of scholasticism, which demanded that students master not only the facts and traditional interpretations of a text, but the proscribed formal structure for each text as well.\(^90\)

Not unlike in a modern medical textbook, the page design and intended educational process carve out intellectual and material spaces in which students are required to respond to the text in order to demonstrate satisfactory mastery of its contents and of the profession. “When

\(^{88}\) Durham University Library Catalogue. reed.dur.ac.uk/xtf/view?docld=ark/32150_s16m311p36f.xml.

\(^{89}\) O’Boyle, *The Art of Medicine*, 261.

\(^{90}\) O’Boyle, *The Art of Medicine*, 259.
the form of the university lectio is properly understood, from these few annotations the structure of an entire literal commentary can be reconstructed,” just as in modern texts there are reflections of a classroom methodology which relies on prompts for problem-solving and specific forms of discourse between professor and student.91

91 O’Boyle, The Art of Medicine, 261.
4. Conclusions and Connections

Methodologically, this study consisted of two subcomponents. First, I developed an organized framework through which to analyse the ramifications, for both physical documents and their users, of scribal modulation of specific aspects of codicological design. Next, I deployed this framework to analyse thirteenth-century medical manuscripts produced for a university audience. This approach allowed me to (i) draw meaningful conclusions about the ways in which anticipated users—students and teachers of medicine—engaged with their texts; and (ii) identify changing and stable trends in page design during the first century in which European universities operated.

4.1 The Framework for Manuscript Design Analysis

As discussed in depth throughout the preceding chapters, many of the subjects of analysis that I focused on in this study have been addressed in existing research as individual topics. Ranging from mathematical assessments of the commonality of various page sizes in large corpora to in-depth studies of signes-de-renvoi within single manuscripts, this array of contributing intellectual work has been undertaken by previous and contemporary scholars implementing both quantitative and descriptive approaches. Drawing on this rich history and the ideas of visual information analysis, the framework I present in this study facilitates detailed, systematic assessment of what I have characterized as “page design,” placing design choices in the context of studying historical traditions of representing information through visually-rich—and therefore,
information-rich—methods. The framework does so by identifying “layers” of material evidence—the proportional spaces devoted to each page feature and the text and visual tools with which these spaces are filled—which, as I have shown, correspond to two major processes in textual production: designing the intended page layout by demarcating page areas, and responding to the initial intentions by filling in page areas with content.

Identification of these processes is significant in that they elucidate scribes’ design thinking during manuscript production. By identifying the main components of the “design thinking” process during the course of a manuscript’s production, and separating these into “layers” of material evidence that correspond to two major processes, the framework presented in this study facilitates a more meticulous and systematic form of assessing the information that has been preserved on the page. This structured understanding divides valuable yet isolated approaches to analysing *mise-en-page* into sections corresponding to the two mechanisms by which scribes effected their design choices—the “major processes” referred to earlier in this conclusion. By organizing observations about the evidence preserved on the page, the framework encourages the researcher to address disparate but related design processes individually and identify how each relates to the needs of the anticipated user of the manuscript.

Not only does the framework help to organize the many details preserved in a manuscript’s design, it enables comparison between individual books in a corpus and

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between corpora more broadly. By pinpointing exactly which features were manipulated in order to achieve specific results within each manuscript’s design, it makes possible a more specific analysis that granulates the changes taking place on the page. At the same time, the framework also unifies observations and guides the researcher to complete a full suite of observations about each manuscript; in the case of the corpus presented in this study, the synthesis of analyzing individual observed features facilitates a more meaningful conclusion about the role of design in manuscript use.

4.2 User Engagement and its Consequences for Design

The scale of the corpus that this study assesses (forty-eight copies of the Articella and thirty-two copies of the Ars commentata), containing the significant majority of surviving copies of these two text collections produced between 1200 and 1300, means that it is not unreasonable to argue that the conclusions I draw regarding the prevalence and impact of specific features are relatively representative of these manuscripts as a whole.93 The comprehensive nature of the corpus and the consistent appearance of specific design features suggest that I can make claims about thirteenth-century European medical textbooks more generally, as I have done throughout this study.

93 82% of the identified surviving Articella manuscripts and 87% of the surviving Ars commentata manuscripts which were produced during the thirteenth century are contained in the corpus; the omitted manuscripts are those of which no images exist, whether in circulation, digitized libraries, or accessible through private connections.
Each feature of the manuscripts assessed reflects the needs of early university learners and teachers. Significantly expanded margins facilitating substantial annotation and the insertion of relatively standard commentaries in addition to lecture notes indicated that, despite the limited budgets of academics, these intellectual practices were crucial to university learning. Likewise, the additional intellectual and scribal labour involved in adding hierarchies of script to differentiate between distinct sections of text, as well as painted running titles and colourful *litterae notabilires*, on this same limited budget, indicates the importance of navigational aids to their anticipated users. These features’ consistent presence reflects the scholastic learning process. The consistent presence of these features reflects the scholastic learning process. Manuscript producers invested extra labour to accommodate specific activities: reference consultation, the primacy of in-classroom lecture, and the central role of multiple generations of commentaries, as well as formal structuring of both texts and ideas. Studying these material manifestations of scholasticism helps us better understand the quotidian experience of the educational practice.

### 4.3 Changing Design Preferences and University Development

Analysing a corpus of manuscripts produced during the first century of the university’s existence as an institution led me to a clearer understanding of the link between university organization and the books produced in the context of formal education. Manuscripts associated with the medical faculty possessed a less robust layout tradition as compared to the texts of law and theology, and the increasing institutionalization of
the university and its medical faculty wrought dramatic codicological changes. The conclusions that I substantiate in this thesis relating shifts in design preferences to corresponding changes in university organization contribute concrete data to existing, more anecdotally-focused studies such as that of O’Boyle which were produced prior to widespread digitization of manuscript resources.

It is valuable to make note of the conclusions drawn across the previous two chapters regarding the relationship between design, contents, and the institutional context of changing departments. During the first half of the thirteenth century, when universities possessed only rudimentary, informal organization and were broadly student- or professor-led, the design mechanisms that facilitated classroom use were equally simple in comparison to their later counterparts. With the development and dissemination of the expanded version of the core text collection that was the Articella, the Ars commentata, in the third quarter of the century, increasingly complex page layouts proliferated at the hands of university scribes. Whilst earlier Articella copies tended to feature the extended marginal spaces and navigational aids common to university manuscripts across the faculties, Ars commentata manuscripts implemented more complex divisions of space and hierarchies of script as well as running titles and signes-de-renvoi. This practice, which required additional investment of time and intellectual effort, reflects demand by students and teachers for manuscripts that were easy to navigate quickly at both the level of individual pages and of the textbook as a whole.

Further, design shifts implemented in order to accommodate the increased standardization of whether and how received commentaries were incorporated in typical
medical textbooks are easy to connect to the contemporary increase to centralized top-down organization in the university medical faculties demonstrated by documentary evidence. The features themselves are reflective of broader scholastic reading practices; the consistency of how they were manifest in manuscripts produced across numerous medical learning centres, and of how they become increasingly consistent in their style over time, is reflective of the rise of university oversight of how textbooks “should” look to be appropriate for use in their classrooms. Although the production methods differed, the practice of standardizing of educational materials is not altogether alien to the modern insistence on having the “correct” material version of a text designed for use in the classroom, nor to the types of navigational features now considered essential in textbooks.

The results produced in this study suggest that further systematic examination of university manuscript corpora consisting of copies of important textbooks used in other faculties would produce similar concrete data. My observations regarding the efficacy of the framework for granulating design observations indicate that it may be a useful approach to take when assessing and comparing design choices in other manuscript types—not only those of medieval manuscripts, or medical texts. This method may then facilitate meaningful comparison of consistent data points between corpora, as well as making connections between anticipated use revealed in design and the reading practices of specific groups of individuals for whom manuscripts were produced.

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94 See extensive documentation throughout O’Boyle, *The Art of Medicine*. 

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Bibliography


Appendices: The Manuscript Corpus

Appendix A: Copies of the Articella Produced Between 1200 and 1300

The corpus on which this study is based on information contained in Cornelius O’Boyle’s catalogue of contents lists and basic descriptions of manuscripts containing the Articella and its related texts. This reference text is the most robust published identification of relevant manuscripts to date, and incorporating the majority of the list into my corpus allows me to assert that my data are reasonably representative of the body of Articella and Ars commentata manuscripts actually produced during the period in question. Unfortunately, a small subset of manuscripts are not available through publicly digitized resources nor have I been able to obtain private photographs of their pages or procure detailed descriptions of their design. Therefore, these manuscripts have been omitted; they represent 18% of the total Articella copies and 13% of the Ars commentata copies. That means that 82% of the surviving Articella manuscripts and 87% of the surviving Ars commentata manuscripts produced between 1200 and 1300 are captured in this study’s corpus.

In isolated instances, I have expanded the list; I have identified manuscripts that are missing the initial copy of the Isagoge by which O’Boyle defines the Ars medicine/Articella/Ars commentata. On the basis of evidence preserved during digitization and not easily available at the time of his production of his list, which was partially informed by catalogues rather than strictly in-person examination, I assert that these manuscripts were originally intended and designed as copies of this text and have
therefore included them in my corpus. Further, I have grouped the \textit{Articella} and \textit{Ars medicine} copies as he identifies them separately, despite that functionally the design and intention of both groupings was essentially identical, and \textit{Articella} is the name by which the compilation is more broadly known.\footnote{O'Boyle, \textit{Thirteenth- and Fourteenth-Century Copies of the Ars medicine}, 3–11.}

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Appendix B: Copies of the *Ars commentata* Produced Between 1200 and 1300

As in Appendix A, the list of *Ars commentata* manuscripts included in the corpus is primarily defined by the contents of O’Boyle’s manuscript checklist. The following set of manuscripts represents all of those identified by O’Boyle with some additions based on my independent research, which relies on visual data captured during digitization.

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