DIY Braille: How to produce professional braille in-house
(and why you should)

# Slide 1

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(and why you should)

Accessing Higher Ground – November 2024

Em Kribs, Wichita State University

# Slide 2

Wichita State University

* Public research university in Wichita, KS
* Enrollment of 17,700 students
* <https://www.wichita.edu/>

# Slide 3

Wichita State University

Yes, this is our real mascot. His name is WuShock, and he’s a “big, bad muscle-bound bundle of wheat”.

# Slide 4

Academic Accommodations and Accessibility

* Also known as AAA or triple-A
* Office in the Media Resources Center at Wichita State University
* Built from scratch by Jay Castor
* We have graduated three students who used our braille materials
	+ One is now in medical school, and we still get requests for transcription services when they run into issues
	+ One of our graduates told us that he had considered leaving WSU due to some uncooperative instructors, but he stayed specifically for the quality of his materials

# Slide 5

Some data (1 of 2)

In AY22-23, we transcribed 179 documents across 12 courses for three students

* 3,000 pages of print
* 7,421 pages of braille
* 804 tactile graphics

In AY23-24, we transcribed 366 documents across 20 courses for three students

* 4,533 pages of print
* 14,976 pages of braille
* 2,335 tactile graphics

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Some data (2 of 2)

AY24-25:

As of Oct. 11, 2024, we had transcribed 282 documents across 11 courses for three students

* 3,372 pages of print
* 11,105 pages of braille
* 2,928 tactile graphics

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Q: But why does Wichita State University have an entire office and four full-time staff dedicated to braille?

A: We got sued.

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From the resolution agreement:

“The Complaint alleged that WSU discriminated against her, as a blind student, in violation of Title II of the ADA and Section 504 of the Rehabilitation Act of 1973 by:

* using inaccessible electronic and information technology, including: inaccessible class assignments, materials, and tests;
* using inaccessible student computer workstations; and
* not providing alternative accessible formats of print material, class assignments, and tests in a time and manner that would provide equally effective communication to blind students.”

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Alternatives to providing physical braille

These are useful tools, but have drawbacks:

* Screen-readable materials
	+ Relies on materials being correctly formatted
	+ Heavy demand on working memory
	+ Can be trickier to navigate than text
	+ Do not provide students an equitable learning experience
* Refreshable braille displays
	+ Still relies on materials being correctly formatted
	+ Often quite loud
	+ Usually cannot display tactile graphics
	+ Expensive

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Why braille and tactile graphics?

* Better parity with other students’ learning experiences
* Improved subject literacy
* Offloads working memory
* Tactile graphics provide alternative presentation of information, as well as spatial information

# Slide 11

What about contracting out braille? (1 of 2)

Third party braille vendors, while an invaluable resource, have some drawbacks:

* Slow and inflexible, often have to account for shipping time
* More steps, more people, more opportunities for problems and delays
* Requires students to either make do with audio formats for in-class materials OR instructors to have materials ready to go weeks or months ahead of time

# Slide 12

What about contracting out braille? (2 of 2)

* Vendor may not be sufficiently familiar with subject matter to avoid pitfalls (e.g. a ρ is NOT the same thing as a lowercase p)
* Expensive
* Lack of QA process and lack of recourse if materials are faulty
* Less reusable
	+ First user may lose or damage materials
	+ Materials wear out over time, requiring you to pay contractors again
	+ Tactile graphics cannot be adapted for other uses, such as if a graphic appears in both the textbook and a slide deck

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Some math

In spring of 2023, we received a quote from a braille vendor for $40,000 for a single trigonometry textbook.

To extrapolate from there:

Full time undergraduate courseload: 12 credit hours, or four 3-credit classes

If we assume one textbook per class:

4 classes × $40,000 = $160,000 per student per semester

(Probably only $80,000 per student for a summer semester)

This figure does not cover in-class materials like slides, assignments, tests, handouts, etc.

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What about AI?

* AI is a useful tool with plenty of applications, such as Optical Character Recognition (OCR) and generating image descriptions.
* However, at this point we should only be using AI for things where we’re willing and able to check its work, or where correct and accurate output doesn’t matter.
* AI cannot think. It is a tool for generating statistically likely outputs. The more obscure the subject, the less likely AI can help.
* AI is a tool. You still need humans to wield it.

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Starting Costs

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Braillo 300 S2 Embosser: $25,000

# Slide 17

Elite 200 Embosser: $14,995 – $25,448

# Slide 18

PIAF: $1,745

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Starting costs for equipment

* Braillo 300 S2 Embosser: $25,000
	+ <https://braillo.com/braillo-300-braille-embosser/>
* Elite 200 Embosser: $14,995 – $25,448
	+ <https://viewplus.com/product/vp-elite/>
* PIAF: $1,745
	+ <https://store.humanware.com/hus/piaf-picture-in-a-flash-tactile-graphic-maker.html>

**Equipment total: $41,740 – $52,193**

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Software

* Duxbury Braille Translator: $695 per user
	+ <https://www.duxburysystems.com/default.asp>
	+ Save your installer!
* MathType: $61.95 per user per year
	+ <https://store.wiris.com/en/>
	+ (20% off with email ending in .edu)
* Adobe Illustrator or other vector drawing program
* Microsoft Word

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Supplies

* 11×11.5” Continuous Feed Braille Paper: $50.99 per 1,000 sheets
	+ <https://americanthermoform.com/product/braille-paper-11x11-5-plain-continuous-sheets/>
* Tabloid-size Swell Paper: $225 per 100 sheets
	+ <https://americanthermoform.com/product/swell-touch-paper/>
* 11×11.5” Swell Paper: $165 per 100 sheets
	+ <https://americanthermoform.com/product/swell-touch-paper/>

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Also need

* A printer/copier and its requisite supplies
* Normal office supplies (desk, computer, etc.)
* Staff

Recommended:

* Somewhere to put this stuff with great soundproofing or where no one will mind the noise
* Hiring a braille user to check your work, especially when first getting started, is invaluable

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Staffing Tips (1 of 2)

* Experience in higher education, ideally with teaching
* Research and critical thinking skills
* Cognitive flexibility and/or competence with different perspectives
* Criticism competent
	+ Able to take criticism
	+ Able to understand criticism and distill out useful information
	+ Able to incorporate useful information

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Staffing Tips (2 of 2)

* Technical proficiency
* Comfortable with long periods of solitary work (i.e. introverts)
* Not intimidated by instructors
	+ We hire for introverts, but social competence is definitely a plus
* Proactive, adaptable, attention to detail
* Curious and motivated to learn

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Don’t I need to know braille? (1 of 2)

* There is a national shortage of braille transcribers, according to Jana Hertz of the National Braille Association. (source: <https://www.theoglethorpeecho.com/local-news/high-demand>)
* Braille can be learned
	+ Useful for getting started: <https://uebonline.org>
	+ National Federation of the Blind and Library of Congress offer braille transcription certification: <https://nfb.org/programs-services/braille-certification>

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Don’t I need to know braille? (2 of 2)

Other braille resources:

* Braille Authority of North America codebooks and guidelines: <https://www.brailleauthority.org/publications-area>
	+ Includes Unified English Braille, Nemeth (for math, science, chemistry), music, etc.
* Duxbury knows braille, so transcribers need to know when Duxbury is likely to fail
* Some useful braille to learn: Numbers, alphabet, Nemeth indicators, transcriber note indicators

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The brailling process (1 of 2)

This is highly simplified, but in essence:

1. Acquire syllabus and materials, create a to-do list with due dates. Start from the nearest deadline and work into the future.
2. Copy document contents into MS Word BANA template from Duxbury, leaving blank pages for figures and diagrams.
	1. Document will become linear in this process; sidebars, breakout boxes, etc. will need to be indicated, and you will need to find a sensible location in the text.
3. Make copies of images (I recommend the snipping tool from Microsoft) and create blank documents in Adobe Illustrator

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The brailling process (2 of 2)

1. Place original images on one layer, then recreate on another layer. Hide the original image’s layer, and make sure any braille text is the correct size.
2. Translate text into braille using Duxbury and emboss text and tactile graphics
3. Collate into a single document, which can then be given to the recipient.
4. Save everything in case of future need. Even when new editions of textbooks come out, you can usually reuse materials.
	1. Don’t forget to submit a request to distribute to the publisher!

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Some tips:

* Brailling takes time, and that time adds up quickly. Equations, images, tables, and lousy file formats all add to the amount of time you’ll need.
* We tell instructors to give us a minimum of two weeks. Even when this is not possible, being ahead of the class allows for more flexibility when urgent situations arise.
* For teams with multiple transcribers, people seem to prefer a mix of subjects rather than handling entire courses on their own.

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Questions?

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