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Technical Material in UEB

DEVELOPING AN NLS CURRICULUM

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# Clovernook Printing House

Clovernook Center for the Blind and Visually Impaired opened its doors in 1903, and is located in Cincinnati, Ohio, USA. Clovernook's Braille Printing House has been in operation since 1914, when a printing press was donated to the organization. Braille production has evolved considerably over the years, and today Clovernook is a global producer of braille – over 20 million pages of braille are shipped to libraries and individuals each year. Much of Clovernook’s work is on a contractual basis with the National Library Service for the Blind and Print Disabled (NLS), Library of Congress, which provides accessible materials to their patrons.

Clovernook also produces a number of additional publications, as well as menus, business cards, calendars, and other assorted braille items. A recent addition to Clovernook’s services is an Arts & Accessibility Initiative which subsidizes the production of accessible materials for cultural institutions. At Clovernook, each step of the braille production process is able to be performed in-house – this includes scanning, transcription, proofreading, embossing, binding, and shipping. Clovernook is also a founding member of the Braille Authority of North America (BANA).

# Technical Braille Transcribing Course Background

NLS has offered braille transcription courses and professional certifications since the 1960s. These courses are available free of charge to any citizen or resident of the United States, function as an industry requirement for many state and federal braille production contracts, and aim to ensure that braille transcribers and proofreaders are familiar with the established rules and guidelines of braille codes used in the United States.

In November 2012, Unified English Braille (UEB) was adopted by BANA’s United States members and implementation began in January 2016. Prior to UEB, English Braille American Edition (EBAE) and Nemeth Braille Code for Mathematics and Science Notation (Nemeth) were the braille codes used for producing braille materials in the United States.

As NLS began updating its courses to reflect the new code, it was determined that a new course was needed. The Literary Braille Transcribing course focused on teaching the basics of how to transcribe “literary” materials – it did not address the transcription of mathematics or technical subjects. Moreover, with the adoption of UEB and retention of Nemeth, two viable mathematic codes were now official in the United States – however the Nemeth certification course was the only NLS course that covered mathematics.

In the fall of 2016, under contract with NLS, Clovernook began developing the Technical Braille Transcribing course – an NLS certification course for the transcription of mathematics and technical materials using UEB.

# Course Content

Due to the demanding nature of the course, prerequisites are required of prospective students. Individuals registering for the course are required to have Library of Congress certification, as of January 2016 or later, in Literary Braille Transcribing (UEB). Individuals certified prior to 2016 are required to have a Letter of Proficiency in UEB, which is an add-on to their EBAE certification. Applicants are also required to have at least one year of experience using this certification.

The technical course contains 14 lessons – Lesson 1 serving as a refresher, and Lesson 14 serving as the final course exercise. Lessons 2-13 contain drills where students practice applying the lesson concepts to a transcription, then compare their work to an answer key and check for accuracy. Each lesson concludes with an exercise which is submitted for evaluation. Students must successfully pass each lesson, within three attempts, before progressing further through the course. The contents of the lessons are as follows:

## Lesson 1

Lesson 1 is a refresher that contains a variety of topics that are presupposed knowledge from the Literary Braille Transcribing course. It provides an opportunity to review important UEB concepts, with it being necessary to have a solid foundation in these concepts before further training in technical materials is attempted. Therefore, this lesson functions as an additional screening for the course and ensures that transcribers have fully absorbed the rules and guidelines presented in the initial literary course.

## Lesson 2

Lesson 2 instructs students in the transcription of poetry in various formats, as well as scansion and stress. Students learn how to transcribe items such as multi-level poems, line numbered verse, and poems with irregular spacing.

## Lesson 3

Lesson 3 instructs students in the transcription of dialogue as it relates to plays, interviews, cartoons, and graphic novels. Formatting guidelines for each of these items is also covered within this lesson. For cartoons and graphic novels, particular attention is paid to how transcribers can best transcribe highly visual content that may have subjective elements – determining what is important for the braille reader, and how to convey images within a format that also contains dialogue.

## Lesson 4

Lesson 4 serves as an introduction to the transcription of foreign language material. Students begin by learning how to transcribe early forms of the English language, and then progress into learning how to distinguish Roman from non-Roman script. Guidance is also provided on how students can identify what is foreign text and what is anglicized text. This lesson also teaches students “Method 1” and “Method 2” for foreign language translation from BANA’s *Provisional Guidance for Transcribing Foreign Language Material in UEB.*

## Lesson 5

Lesson 5 instructs students in the use of “Method 3” for foreign language translation from BANA’s *Provisional Guidance for Transcribing Foreign Language Material in UEB.* Students learn to identify foreign language text that may be transcribed in UEB without the use of code switching indicators. Students also learn how to use braille formatting to distinguish English text from foreign language text during transcription.

## Lesson 6

Lesson 6 provides an introduction to IPA Braille, Music Braille, and Nemeth Braille. It familiarizes students with a few foundational concepts of each of these codes in preparation for Lesson 7, where they will learn how to treat these codes when they occur within UEB contexts. Students are not expected to have previous knowledge of these codes, and it is made clear that this lesson does not intend to certify or qualify the student as an IPA, Music, or Nemeth transcriber. Rather, students are taught how to identify some basic elements of these codes, so that they will be able to place them within code switching indicators in the next lesson.

## Lesson 7

Lesson 7 teaches students how to apply code switching indicators within a braille transcription. Students learn how to place these indicators when a braille code other than UEB occurs within a UEB transcription – such as foreign language codes, Music Braille, Nemeth Braille, or IPA Braille. These indicators signal to the braille reader the switch from UEB to a non-UEB braille code.

## Lesson 8

Lesson 8 familiarizes students with the use of Line Mode to represent print-drawn lines. Additionally, the students learn about the use of guide dots. Students also learn how to transcribe several common types of puzzle – including crosswords, Sudoku, cryptograms, and word searches.

## Lesson 9

Lesson 9 instructs students in the identification and transcription of computer notation within UEB, including web addresses, hashtags, and twitter handles. Other topics include file names and directory pathways. The lesson also includes instruction on computer programming and how to format lines of code.

## Lesson 10

Lesson 10 serves as an introduction to math using UEB, teaching the student key signs of operation and comparison, and their spacing rules. The lesson also includes signs of omission, numeric passages, grade 1 mode, typeform usage, and division of numbers across lines.

## Lesson 11

Lesson 11 builds on the foundational concepts introduced in the previous lesson. Students are instructed in areas that include abbreviations, grouping devices, fractions, superscripts, subscripts, radicals, division of math expressions, and general format guidance for math.

## Lesson 12

Lesson 12 continues the students’ journey through math using UEB, introducing topics that include arrows, shapes, composite symbols, and mathematical modifiers.

## Lesson 13

Lesson 13 concludes the math content of the Technical Braille Transcribing course. Students are instructed in the current rules and guidelines for function names, spatial arrangements, labeling of diagrams, tally marks, matrices, determinants, vectors, systems of equations, and chemistry.

## Lesson 14

The final lesson is a capstone exam that students must complete and send to NLS for evaluation. It comprises a wide variety of content, drawn from each lesson. Students are tested on their knowledge of an extensive array of braille rules and guidance.

# Development Methods

Clovernook began its development of the Technical Braille Transcribing course by creating a master list of all the braille concepts presented in *The Rules of Unified English Braille* (RUEB) §11-16 produced by the International Council on English Braille (ICEB). This list was first broken down into broad categories of related concepts, such as poetry, foreign language, and math. Within each category, related concepts were grouped into sub-categories, such as fractions, radical expressions, or poetry with language translation.

The grouping and organizing of these concepts evolved into rough outlines for each of the lessons. The braille rules and guidance – “rules” being the rules of the braille code, “guidance” being recommendations, for example, on best practices to provide consistent formatting of braille materials – were reviewed to ensure the lesson outlines were organized in such a way that the most foundational pieces were introduced first by ordering concepts so that they would build upon each other. This was a central and recurring theme throughout the development of the course – re-ordering concepts, rules, and guidance to ensure that students were provided with clear and thorough instruction, and that lessons progressed in such a way that they built upon their predecessors.

Once this rough course structure was in place, Clovernook’s curriculum developers – Samuel Foulkes, Saul Garza, and Tina Seger – took on lessons that appealed to their strengths and interests. Each developer was responsible for writing the initial rough draft of their assigned lessons. This included the transferal of rules and guidance into instructional language, as well as the incorporation of original and sourced examples. Special care was given to try to select examples that were interesting, diverse, and reflective of the types of materials that people might encounter.

After the initial rough drafts were created, there then came a much more arduous step – reconciling stylistic idiosyncrasies of the various authors, ensuring consistent language and terminology, and double-checking the references of rules and guidance provided within the course. Developers also began verifying that concepts built upon each other in a sequential way within the course. While this approach allowed multiple drafts of lessons to be developed simultaneously – the “silo” approach, at times, led to quite a bit of revision and rewriting.

As the lesson drafting took place, conversations between Clovernook and NLS revealed several “gaps” within the scope of the new technical course. For example, how to fully develop a lesson that will instruct students in the transcription of scansion and meter, which is used in poem analysis, when the prerequisite Literary Braille Transcribing course only covers the most basic formatting concepts related to the transcription of poetry.

Further review of RUEB, the *Unified English Braille Guidelines for Technical Material* (GTM), and BANA’s *Braille Formats: Principles of Print-to-Braille Transcription,* as well as additional provisional guidance published by BANA, allowed course developers to identify the additional concepts necessary for inclusion in the course, in order to bridge the gaps and build upon concepts that were only briefly covered in the Literary Braille Transcribing course, RUEB, and GTM.

This led to substantial revisions of the course structure, and editing of individual lessons already in progress, to incorporate the braille rules and guidance pertinent to the additional material. Moreover, lessons had to clearly indicate to the student when an instruction is a rule, as opposed to a general recommendation of best practice.

Midway through development, as lessons continued to take shape, Clovernook moved away from authorial silos and shifted to a “roundtable” approach – lessons were now reviewed, edited, and rewritten by the whole development team at group sessions. Ahead of these sessions, developers would independently review the lesson that was “on the table,” and make their own notes regarding any gaps or inconsistencies. With collective input, roundtable sessions facilitated greater concept and language consistency, and allowed the developers to make substantial changes more efficiently.

During development, a number of beta testers enrolled in the course. These testers took the course as students, with the additional requirement of submitting feedback and errata reports on the course materials along with the submission of each lesson exercise. This provided Clovernook with valuable feedback – however, it was at times a challenge to both develop a course and to integrate active students within a course that was still under development.

Full drafts of completed lessons were also sent to Mountain View Unit, a prison braille program in Gatesville, Texas, where transcribers comprehensively reviewed and tested every aspect of the lessons, then shared their detailed feedback with the Clovernook team. Their work was consistently excellent, and Clovernook sees their role as a key part of the successful development of this course.

When a lesson’s content was deemed complete, the print documents would be formatted in Microsoft Word, and simbraille was inserted for examples. Once these steps were completed, all lessons were again sent to Mountain View for production of the braille files. This provided Mountain View with another opportunity to provide feedback to Clovernook when looking at the course as a whole, and helped ensure the instructional language was consistent, that concepts built upon each other, and that examples, drills, and exercises were clear and wholly pertinent.

The final step of development was the production of answer keys and grading guidelines. At times, this necessitated some creativity on the developers’ part. For example, the Lesson 3 exercise contains a comic book story – the transcriber must insert descriptions for the various frames, and these descriptions will naturally vary from transcriber to transcriber. In this case, Clovernook developed “key element” grading guidelines to assist course graders in evaluating Lesson 3 exercise submissions.

# Challenges

The sheer scope and breadth of the planned course was initially the most significant challenge – and, as time passed, NLS and Clovernook incorporated additional relevant material to the course, which necessitated significant restructuring on the development end. What initially began as material drawn strictly from RUEB, began to incorporate a wide-ranging spectrum of rules and guidance from supplementary sources.

An additional challenge was the approval of updated guidance during course development. In early 2019, for instance, the approval of BANA’s *Provisional Guidance on Transcribing Mathematics in UEB* necessitated significant rework on the mathematics lessons.

Lack of guidance also posed a challenge – at times during the development process, the Clovernook team came across areas where there was no official guidance – for example, how to format linked expressions or formal proofs in mathematics.

The existence of multiple “correct” transcription methods for a single piece of technical material was also a challenge during development. For instance, foreign languages can often be transcribed in more than one way. In the United States, there are four different methods that may be used – therefore, the course drills and exercises had to specify which method to follow. This also occurred in various sections of the mathematics – use of grade 1 mode when transcribing equations can often be done in two or three different ways. Course developers had to be careful to ensure that these competing methods were clearly and distinctly explained, and that it was apparent to the student which method they should be using or practicing within a course drill or exercise.

# Course Sources

*Braille Formats: Principles of Print-to-Braille Transcription, 2016*

*Guidance for Transcription Using the Nemeth Code within UEB Contexts, Approved June 2016*

*Instruction Manual for Braille Transcribing, UEB Edition, 2015*

*Introduction to Braille Music Transcription, 2005*

*IPA Braille: An Updated Tactile Representation of the International Phonetic Alphabet, 2008*

*Music Braille Code, 2015*

*Provisional Guidance for Chemistry Notation Using Nemeth in UEB Contexts, Approved March 2017*

*Provisional Guidance for Transcribing Foreign Language Material in UEB, Approved May 2015*

*Provisional Guidance on Transcribing Mathematics in UEB, Approved May 2019*

*The Nemeth Braille Code for Mathematics and Science Notation, 1972 Revision*

*The Rules of Unified English Braille, Second Edition, 2013*

*Unified English Braille Guidelines for Technical Material, 2008 version updated August 2014*

*World Braille Usage, Third Edition*

# Looking Ahead

Clovernook completed the Technical Braille Transcribing course in early 2020, and looks forward to the implementation of this course by NLS along with the further professionalization of braille transcription in the United States. As the braille transcription process becomes increasingly automated, through the evolving sophistication of translation software, it is vital that transcribers who use these programs are fully versed in the rules and guidelines for transcribing technical materials in UEB.

As additional rules and guidance are published by ICEB and BANA, the Technical Braille Transcribing course will be updated to reflect these developments. It is our sincere hope that this course will serve as a way for technical materials produced in the United States to be of high quality and produced in a consistent manner.