**Implementation of UEB in**

**Canada’s Largest School District**

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The International Council on English Braille (ICEB) approved Unified English Braille (UEB) for adoption by its seven member braille authorities in 2004. The Canadian Braille Authority (CBA) passed the motion in 2010 to recognize UEB as the preferred code in Canada.

**CBA UEB Summit**

Two years later CBA organized the CBA UEB Summit May 31-June 2, 2012 at the Provincial Resource Centre for the Visually Impaired (PRCVI) in Vancouver. Dr. Cay Holbrook and Betty Nobel, both CBA Board members and prominent educators in the braille field, were co-hosts.

There were 30 participants which included 24 Canadians from across the country, five from the United States and one from the United Kingdom. The Summit attendees consisted of educators, professors, managers, braille consumers, braille transcribers/producers, agency representatives, and researchers, many of whom belonged to more than one of the groups. The Chair of the Braille Authority of North America (BANA), researchers from the American Printing House for the Blind (APH) who were working on the revision of *Patterns*, Braille Institute staff involved in the Braille Challenge, and the staff member from the Royal National Institute of Blind People (RNIB) charged with preparing the UEB implementation plan for the UK participated.

The purpose of the Summit was:

• to provide an understanding of UEB for the participants;

• to determine what changes would be required in educational materials, including those purchased from the United States; and

• to start the UEB implementation plan for Canada.

The first day of the Summit was a hands-on, interactive workshop on the UEB changes to the literary braille code in use and the development of symbols to cover all technical materials so that all participants achieved an understanding of the principles of UEB and its construction.

The second day’s workshops demonstrated how UEB handles higher mathematics, physics and chemistry; identified early-grade instructional materials which would be satisfactory for UEB and which would require changes; and contributed information on access including a demonstration on back-translation of braille to print by Joe Sullivan.

The final day’s session led by Dr. Holbrook provided the essentials for the Canadian implementation plan. Dr. Carol Farrenkopf, Coordinator, Toronto District School Board (TDSB) Vision Program offered to pilot UEB implementation through the Vision Program under her direction.

**Training Staff**

That October, as the first step in the implementation of the UEB pilot, Dr. Farrenkopf and 18 of her staff members arrived at the Canadian National Institute for the Blind (CNIB) for the first of seven three-hour classes held throughout the 2012 - 2013 school year. Phyllis Landon, CNIB volunteer and Chair of the ICEB Code Maintenance Committee (CMC), and Darleen Bogart, volunteer CNIB National Braille Convenor, led the participants through the UEB Update Course they had developed as well as an overview of UEB Technical.

The hands-on classes covered the basics of UEB with homework providing more practice through self-marked exercises also requiring six-key entry. Review, questions, discussion and working with seat-mates were integral to each session. Although much course content was covered at each session there was ample time for the participants to assimilate the new concepts as the next class was at least a month away.

The *Rules of Unified English Braille* was used extensively throughout the course as the reference so that it would be familiar to the teachers and transcriber and would become their go-to authority.

At the conclusion of the course, a take home test was given to each of the participants. They had two weeks to complete it on the honour system with a signed declaration that they had not communicated with anyone about the test content, that they had not used a braille translation program, and that the content of the test would not be disclosed to anyone.

The test consisted of a series of sentences to be transcribed from print into braille designed to cover the changes UEB brings to braille. The transcription could be done using a computer transcription program or a manual braille writer. Ninety was the mark necessary for a pass using a demerit marking system from 100 with two demerits for most errors. The 18 teachers and one transcriber were successful and each earned a CNIB/CBA certificate updating their current braille qualifications. The certificate is recognized throughout Canada.

**Pre- and Post-Training Questionnaires**

Pre- and post-training questionnaires were administered to everyone who participated in the training sessions. Forty-seven percent of the participants were between 46 and 55 years of age and 47% first learned braille within the past 6 to 10 years. Only 24% of the participants had previous UEB instruction through workshops and conferences. The vast majority of participants (94%) were Teachers of Students with Visual Impairment (TSVI). Responses to every pre- and post-training response will not be reported in this paper for reasons of brevity; however, interesting or important responses will be discussed.

When asked about their initial feelings about UEB (pre-training), 35% said they were excited, 18% were calm, 12% were indifferent, 29% were positive, and 6 % were enthusiastic about it. After the training, 47% of participants reported that they were excited, 6% were calm, 12% were still indifferent, 24% felt positive, and 12% were enthusiastic. In neither the pre- nor post-training questionnaires did participants report feeling negative, unenthusiastic, or anxious about UEB. Virtually identical responses were reported when participants were asked about their feelings toward Canada adopting UEB.

The reported feelings were reflective of the actual emotions displayed during the training sessions at the CNIB. On the first day of training, there was a sense of excitement mixed with caution. There was a lot of chatter, laughter, confusion, and phrases like, “But what about…”, “Why did that rule change?” and “That makes a lot of sense.” By the end of the training, all participants were fully engaged in the process of learning the new code. A renewed sense of “team” was evident and teachers were eager to start teaching their students UEB. In fact, one high school student [who was fluent in EBAE (English Braille American Edition) and Nemeth braille] asked his teacher to teach him the new code as she learned it during the training sessions.

Additional pre- and post-training questions were asked of participants regarding the use of literary braille: Do you think UEB is going to be easier, harder, or the same as EBAE for the following groups?: Teachers of Students with Visual Impairment, Orientation & Mobility (O&M) Specialists, Independent Living Specialists, Braille Transcribers/Braillists, Students who Read Braille (kindergarten – grade six), Students who Read Braille (Grade seven – 12), College/University Students who Read Braille, Adults who are Experienced Readers of Braille, Adults who are Newly Blinded/Learning Braille, and Seniors who Read Braille.

Pre-training responses regarding TSVIs indicated that 65% felt it would be easier for TSVIs to use UEB, 6% felt it would be harder, and 29% thought it would be the same. In the post-training responses, 80% stated it would be easier for TSVIs, while 13% said it would be the same, and 7% felt it would be harder. Though the increase isn’t statistically significant, it suggested a trend that post training, more participants felt it would be easier for TSVIs to use UEB.

With respect to kindergarten – grade three students and experienced adults who read braille, pre-training feelings by participants indicated that 80% of participants felt that young children would find UEB easier to use than EBAE, while participants felt only 31% of experienced adult braille readers would find UEB easier. After the training, more participants (93%) thought UEB would be easier for young children, and an increase (54%) thought UEB would be easier for experienced adult braille readers. Of interest were the scores related to newly blinded adult braille readers and seniors who read braille. Participants felt (pre-training) that 69% of newly blinded adults learning braille would find UEB easier than EBAE, versus 38% responses related to seniors who read braille. However, after the training, participants seemed to have a much more positive perception about seniors who read braille (77% felt UEB would be easier for seniors who read braille).

A final series of questions were proposed for the same groups as outlined above, except the questions related to braille for math and science. Participants were asked for their perception regarding UEB being easier, harder, or the same than the Nemeth Braille Code. Interestingly, pre- and post-training responses to the first question regarding how TSVIs would respond with respect to UEB math were similar to learning UEB for literary usage: 76% of participants initially felt that UEB math would be easier than Nemeth Braille, and 80% felt it would be easier after they completed the training.

Pre- and post-training perceptions about kindergarten – grade three students learning UEB math were similar to their perceptions about using UEB for literary purposes: pre-training, 82% of participants felt that young children using UEB math would be easier for them to learn than Nemeth Braille, while after the training, that number increased to 93%. Interestingly, pre-training responses indicated that 47% felt UEB math would be easier, 29% felt it would be harder, and 24% felt it would be the same for students who read braille in grades seven – 12. After the training, 66% felt it would be easier for this age group, 17% felt it would be harder, and 17% felt it would be the same degree of challenge for them.

For adults who were newly blinded, participants felt (pre-training) that 70% would find UEB math easier to learn, 12% felt it would be harder, and 18% felt it would be the same. After the training, 84% felt it would be easier, only 8% felt it would be harder, and 8% felt it would be the same.

Overall, the feelings toward UEB (for literary and math purposes) were primarily positive in nature before the training occurred. After the training, responses were even more positive about UEB. Though many participants commented that the a transition period from EBAE to UEB would be most challenging for students working in both codes, participants seemed to understand that it would only be a two to three year period of adjustment. One participant summed up her dichotomous feelings as, “I am very excited to begin teaching UEB to my students, but I’m worried about teaching chemistry and algebra to my high school student.”

After the training was completed and responses to the questionnaires were analyzed, the results of the questionnaires were shared with the participants. Participants had already completed the final exam and implementation strategies were shared with all Vision Program personnel. At one staff meeting, several TSVIs felt strongly that moving forward with a positive attitude about UEB would encourage students (and their families) to develop positive attitudes about the code as well.

**Development of a Transition Plan**

Several implementation factors needed to be considered before actually instructing students in UEB. All students with visual impairment in Toronto are included in the regular classroom with their same age peers unless a small class placement is needed for some “other” learning need (e.g., learning disability, developmental disability). TSVIs in the Vision Program are “Itinerant” and travel from school-to-school each day to support students with visual impairment. A full-time Braille Transcriber with the Vision Program holds responsibility for transcribing books, teacher handouts, and other materials in braille for all of the students who read braille in the Vision Program. A new computer system, embosser and high speed scanner were purchased for the Vision Program and specific training was provided to the Braille Transcriber on UEB and Duxbury. During the UEB transition years (2013 – 2015), the Braille Transcriber produced materials in both EBAE and UEB, as needed. All braille production from September 2015 onward has been in UEB only.

As at September 2013, there were 26 students in Toronto who were using braille as a primary or secondary literacy medium. Determining which students would make up the first UEB cohort and subsequent cohorts was a priority. Communication with students, parents and schools regarding the impending change to UEB was then planned. Support of the students, their families, and their schools was critical if the Vision Program was to move forward in a positive way. Finally, with limited UEB teaching resources from which to choose, TSVIs met with each other to share ideas and materials. Vision Program staff schedules were organized in such a way as to provide weekly opportunities to support each other through “professional learning communities”. It was during these periods (i.e., staff were not working directly with students) that staff were present in the Vision Program office working together and supporting each other as needed.

**Student, Parent, and School Consultation**

Knowing that UEB had been adopted by Canada in 2010, Vision Program personnel informally started the process of communication about UEB with students, their parents, and their schools soon afterward. In the Spring of 2013, TSVIs and Dr. Farrenkopf began formally communicating with students, parents and schools about the transition to UEB during the annual program review meetings for the students. At these annual review meetings, student progress regarding achievement of disability-specific goals in the Individual Education Plan (IEP) is reviewed. TSVIs and Dr. Farrenkopf shared information about UEB and described the implementation plan to everyone at these meetings. IEPs were updated to include instruction in UEB in preparation for the upcoming school year.

**Determining Student Implementation Phases**

With the expectation that UEB instruction would begin with the Phase one students in September, 2013, Dr. Farrenkopf consulted with Vision Program personnel regarding the most logical group to start learning UEB: kindergarten to grade three students. In Toronto, there were five such students. It was also decided that students who, regardless of age, were recently assessed through a Learning Media Assessment as needing to learn braille would start with UEB. Students (regardless of age) who were learning braille through a functional braille program and using only uncontracted braille were also considered as part of the first cohort to use UEB. Finally, any student already fluent in EBAE who wanted to begin learning UEB during the initial phase was allowed to do so. One high school student chose to learn UEB during the first phase. In total, 17 students made up the first UEB cohort in phase one.

The second cohort (five students in total) included students in grades four to eight. Instruction in UEB for these students was set to begin in September, 2014. The third and final cohort of four students (grades nine – 12) was set to begin in September, 2015. However, the phase one implementation moved so quickly and successfully, that some second phase students actually started to learn UEB during phase one as well. When phase two began, many of the older students (scheduled to start learning UEB in phase three) either asked to start learning UEB a year early, or, their TSVIs encouraged them to start earlier. By the end of June, 2015 (two years from the initiation of UEB in the TDSB), all 26 students had transitioned to UEB.

**UEB Program Planning**

One of the challenges of the implementation plan related to the lack of instructional materials for TSVIs. Some materials were available on Australian and British websites; but, no comprehensive or commercially available program existed at the time. As such, TSVIs used their own creativity to create reading materials and instructional lessons that were based on the literacy programs within which students engaged in their regular classrooms. Older students with already established literacy skills in EBAE were able to learn through methods similar to those used by the TSVIs during their own training.

**Teaching Students**

**Phase One**

During the first phase of UEB implementation with the younger students, students in functional braille programs, and students who were recently assessed as needing braille, TSVIs determined where to start teaching UEB based on the individual needs of each student. For example, TSVIs of students in kindergarten to grade three generally used TSVI-made materials that were based on the literacy programs currently underway in the students’ classrooms. Some TSVIs used adapted programs/materials that were commercially available [e.g., APH, Braille FUNdamentals, RNIB booklets] and adapted them with UEB symbols. A Braille Coach (electronic braille card scanner with voice output) with UEB symbols and words (created by the TSVI and independently “scanned” by the student) supplemented regular classroom materials. Students who knew some EBAE symbols were given direct instruction with TSVI-made materials to learn the new symbols and rules of UEB. TSVI focus was not just on reading UEB, but also on writing UEB.

When teaching students math using UEB, TSVIs generally used the same materials used by the students’ teachers and supplemented concepts with manipulatives where appropriate. Some of the TSVIs found it challenging to “forget” the Nemeth Braille Code when instructing students and had to refer to their UEB manual to remind them of the correct UEB math symbols. It should be noted that even though the TSVI may have found the transcription of print into UEB math to be challenging, the learning process for the students hadn’t changed. That is, students simply learned the UEB math symbols as the symbols arose in their math programs—because they hadn’t already learned Nemeth Braille, they didn’t have to forget anything.

For TSVIs and students using Duxbury Braille Translation software, learning how to select the correct UEB translation table was necessary before producing UEB on a braille embosser. Proof-reading the braille produced by TSVIs and students was a good strategy to enhance UEB reading fluency.

Phase one lasted the entire school year for the 17 students. Feedback from students and TSVIs continued to be positive. The more TSVIs used and taught UEB, the more comfortable they became with the code. TSVIs working with the youngest students commented that UEB math wasn’t an issue because the amount and type of math being taught at that age wasn’t complicated. By the end of June, 2014, TSVIs seemed pleased with the progress made by their students who transitioned to UEB rather seamlessly.

**Phase Two**

As mentioned earlier, the intention was to introduce UEB to the middle-school aged cohort of students in phase two before moving onto high-school aged students the following year (phase three). Given the success of UEB implementation during phase one, the TSVIs in the Vision Program decided that it made sense for other students on their caseloads to learn UEB as well. Some of the phase three students had asked their TSVI to start learning UEB during this time. As a team, Vision Program personnel decided at the outset that if a student asked to learn UEB, he/she would not be denied that opportunity.

Since the students in phase two already had established braille literacy skills, the introduction of UEB was a matter of teaching the code only. Specific instruction by the TSVI on the changes between EBAE and UEB was necessary. Opportunities for practice (reading and writing UEB), along with gradual introduction of UEB symbols, helped older students make the transition to the new code. UEB math symbols and rules were introduced as math concepts arose in students’ math and science classes. One high school student taking chemistry was able to read chemical equations in UEB easily, even though the TSVI initially had some difficulty translating the material into UEB for the student. By the end of June 2015, all students who read braille in the Vision Program had transitioned to UEB. Phase two did not seem to have the intensity that phase one had, likely because the TSVIs had already transitioned the majority of the students in Toronto to UEB the year before.

**Present Day**

Today, there are 27 students who read braille in the TDSB Vision Program. All of the students are reading and writing in UEB. Some students have left the Toronto area over the past two years, while others have moved to the city and have subsequently been taught UEB. Our library stacks have been culled for books containing Nemeth Braille and we continue to add to the braille library with newly transcribed books in UEB. All TSVIs in the program hold certification in UEB and applicants who seek a TSVI position in the Toronto District School Board are required to hold UEB certification. As more commercially made UEB instructional materials are produced, they will be purchased to support the ongoing and future needs of TSVIs in the Vision Program.

The staff and students of the Vision Program were proud to be one of the first (if not *the* first) in Canada to fully convert to UEB. The smooth transition was largely due to the positive attitude toward UEB held by Vision Program personnel at the outset of the process and during the implementation years. Original estimates for conversion to UEB spanned a four year period. However, after the teacher training year and the first two phases of UEB introduction to students, a fourth year was unnecessary. This has been an exciting journey for the staff and students of the TDSB Vision Program.