

Effect of Tech Aided Grade2 Braille (TAG2B)
Tutoring System for Students with
Visual Impairment

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Findings

The major findings of the study are

Result1: Impact of the Tech Aided Grade2 Braille Tutoring System

1. About 16% of the respondents agreed that students with visual impairment use Mechanical Braille for learning, and students use ‘Alphabet word signs ,Group signs, dot 5 and dot4-5 plus initial letters’ to read and write as against 84% of them reported that students with visual impairment never use mechanical brailier to read and write before introduction of ‘Tech Aided Braille Tutoring System’.
2. Around 80% of the respondents reported that ‘Tech Aided Grade2 Braille Tutoring System ‘was helpful to learn ‘Alphabet word signs, Group signs, Short forms, Word meaning, Spelling in Standing Alone contractions’ since the audio format synchronize with the video format
3. Approximately 73% of the respondents reported that ‘Tech Aided Grade2 Braille Tutoring System’ was self-instructional, helpful to learn and practice Grade2 Braille individually, and was self-evaluative saving time .
4. About 74% of the respondents agreed that ‘Tech Aided Grade2 Braille Tutoring System’ involves minimum keys and hence it is easy to use the system for learning and practice Braille at any time.
5. Almost 80% of the respondents reported that ‘Tech Aided Grade2 Braille Tutoring System’ is effective for online teaching and peer tutoring in addition using this system reduces the task of special teachers.
6. About 18% of the respondents reported that ‘Tech Aided Grade2 Braille Tutoring System’ requires basic computer knowledge, limits the tactual mode of learning and has less of interaction with peer group and special teachers as the challenges of the tutor system.

Result2: Effect of Tech Aided Grade2 Braille among Students with Visual Impairment

1. When analyzed the performance score in ‘**Alphabet word sign**’, the students secured highest score in posttest than pretest revealing a significant impact of ‘TAG2B’ (Mean:Pre-1.50;Post-17.71) in learning Alphabet word sign.
2. The performance score for ‘**Strong Word**’ revealed that the students secured highest score in posttest than pretest revealing a significant impact on the effective intervention with the usage of ‘TAG2B’ (Mean:Pre-0.93;Post-13.48)

3. Pertaining to the scores for '**Lower sign**', the posttest score (Post mean 7.40) was higher than pretest (Mean-0.29) indicating the effect of TAG2B on learning contractions
4. As regards to the score in '**Dot-5 with Initial Letter**', the posttest score was higher than pretest and thus impacting the effect of 'TAG2B' (Mean:Pre-0.86;Post-16.07) on learning ' Dot-5 with Initial Letter'
5. Regarding the performance of score for '**Dot4-5 with Initial Letter**', the students secured highest score in posttest than pretest indicating a significant impact on the effective intervention with the usage of 'TAG2B' (Mean:Pre-0.19;Post-3.45)
6. Analysing the performance score for '**Dot4-5-6with Initial Letter**', the posttest score was higher than pretest score impacting 'TAG2B' on learning braille contractions (Mean:Pre-0.21;Post-3.64).
7. Analyzing the performance score for **Final Letter** revealed that the students secured highest score in posttest than pretest revealing a significant impact of TAG2B (Mean:Pre-0.00;Post-8.98)
8. When compared the performance of posttest and pretest score in **Short Forms**, the students secured highest score in posttest than pretest indicating a significant impact of 'TAG2B' (Mean:Pre-2.64;Post-57.98)

Result3: Progress Monitoring score before, during and after introduction of Tech Aided Grade2 Braille Tutoring System

1. In Progress Monitoring (PM)1 to 4 tests ,the score was steadily increasing as: PM1 (M=6.74) ;PM2 (M= 10.45); PM3 (M=13.33) & PM4 (M=15.38) .
2. As regards to the analysis for '**Strong Word Signs**' there was an improvement from pretest (M=0.93) to posttest (M=13.48). The results presented that there was a gradual and graded improvement on learning Strong Word Sign [PM1 (M=5.38), PM2 (M=7.71), PM3 (M=10.07) & PM4 (M=11.98)].
3. The analysis for '**Lower Signs**' revealed that there was graded improvement from pretest (M=0) to posttest (M=8.98) .The results indicated that there was a gradual and graded improvement in learning 'Lower Signs contraction' with the newly developed ' TAG2B tutoring system' PM1 (M=2.50), PM2 (M=3.90), PM3 (M=5.60) & PM4 (M=7.24)] .
4. As regards to the analysis for '**Dot-5 with Initial Letter**' there was an improvement from pretest to posttest. (Pre mean (M=0),Post mean M=8.98) .The findings revealed

that there was a graded improvement in learning Dot-5 with Initial Letter with the newly developed 'TAG2B tutoring system' [PM1 (M=2.50), PM2 (M=3.90), PM3 (M=5.60) & PM4 (M=7.24)] .

5. The analysis for '**Dot 4-5 with Initial Letters**' revealed that there was improvement from pretest (M=0.00) to posttest (M=8.98). The findings revealed that there was a graded improvement in learning Dot 4-5 with Initial Letters with the newly developed 'TAG2B tutoring system' [PM1 (M=2.50), PM2 (M=3.90), PM3 (M=5.60) & PM4 (M=7.24)].
6. The ANOVA for '**Dot 4-5-6 with Initial Letters**' presented that there was gradual improvement from pretest (M=0.00) to posttest (M=8.98). The results showed that there was a graded improvement in learning Dot 4-5-6 with Initial Letters with the newly developed 'TAG2B tutoring system' [PM1 (M=2.50), PM2 (M=3.90), PM3 (M=5.60) & PM4 (M=7.24)].
7. As regards to the analysis for '**Final Letter Contractions**' it was found that there was gradual improvement from pretest (M=0) and posttest (8.98). The findings reported that there was a graded improvement in learning Final Letter Contractions with the newly developed TAG2B tutoring system [PM1 (M=2.50), PM2 (M=3.90), PM3 (M=5.60) & PM4 (M=7.24)].
8. The ANOVA analysis for '**Short Forms**' predicted that there was an improvement from pretest (M=2.64) to posttest (M=57.98). The PM summarizes that there was a graded improvement in learning 'short forms' with the newly developed 'TAG2B tutoring system' [PM1 (M=16.83), PM2 (M=27.71), PM3 (M=39.33) & PM4 (M=48.02)] .

Result4: Analysis of Covariance of Gender, Grade and Locality

1. The 'ANCOVA' result stated that there is no significant difference between Boys and Girls in performing in 'Alphabet Word Sign, Strong Word Signs, Lower Signs, Dot5 Initial Letter, Dot 4-5 Initial Letter, Dot 4-5-6 with Initial Letter, Final Letter Contractions and Short Forms'. Hence '**Gender**' seems to be independent of its own.
2. The study revealed that there was no significant difference among VIII to XII students in performing in 'Alphabet Word Sign, Strong Word Signs, Lower Signs, Dot 5 with Initial Letter, Dot 4-5 with Initial Letter, Dot 4-5-6 with Initial Letter,

Final Letter Contractions and Short Forms'. Hence '**Grade**' seems to be independent of its own.

3. The study indicated that there was no significant difference between locality in performing in 'Alphabet Word Sign, Strong Word Signs, Lower Signs, Dot5with Initial Letter, Dot 4-5 with Initial Letter, Dot 4-5-6with Initial Letter, Final Letter Contractions and Short Forms'. Hence '**Locality**' seems to be independent of its own.
4. The adjusted F value for interaction among Gender, Grade and locality is not significant and determines that there was no significant influence of resultant of interaction among '**Gender, Grade and locality**' when Pre score was taken as covariate. It may therefore be concluded that 'Alphabet Word Sign , Strong Word Signs, Lower Signs, Dot5with Initial Letter, Dot 4-5 with Initial Letter, Dot 4-5-6with Initial Letter, Final Letter Contractions and Short Forms' was found to be independent of its own.

Recommendations

1. This study proved that Assistive technology can be a level player and a great equalizer for students with visual impairment. Hence students with visual impairment need to acquire a plethora of technology skills that will provide alternatives for collecting and communicating information. The study recommends that the teacher training curriculum for students with visual impairment may be designed with the instruction in the application of Assistive technology, information on its availability and maintenance.
2. Many research studies indicate that Assistive technology is boon to persons with disabilities giving promising means to accommodate barriers to independence. But it is adverse that such devices are underutilized by persons with disabilities and the main reason is lack of knowledge and skill among educational personnel. Hence this study recommends the educators and related stakeholders to be well oriented on the benefit of assistive technology and encourage students with disabilities to use the same which would be an equalizer in mainstream education.
3. The Government of India may give financial assistance to improve any prototype developed and make it available as a product for the purpose of educating students with different categories of disability on par with their non-disabled counterparts. The

cost of the devices is also a barrier and the government may address the issue of cost and availability.

Conclusion

Reading is an essential aspect in the context of learning and education in general. Braille remains the main medium of reading and writing among persons with visual impairment. Early introduction Braille contractions can allow beginning readers to take larger chunks of text at a time and help them to process information faster. This study stands as evidence that students who are introduced to more contractions perform better on reading and writing. There is so much technology around in today's society to learn Braille. Technological advancements continue to provide new opportunities to access Braille. This study results demonstrate that technology can be incorporated into Braille instruction and gives important motivational and learning advantages.