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Assessment of Teachers' Preparedness to Teach Learners with Visual Impairments in Regular Universal Primary Education (UPE) Schools

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Abstract
Teachers in Uganda have the obligation to give quality Education to all the learners in their classrooms including those with visual impairments. The preparedness of teachers to teach learners with visual impairments in regular UPE schools in South Western Uganda was examined. The study was conducted in seven districts within South Western Uganda. The objectives of the study were to establish the Braille skills possessed by teachers, and to determine the availability of adapted materials, equipment and devices for LVI. The study adapted the theory of Ribot and Peluso (2003) which deals with all possible means by which a person is able to benefit from things, and it was supplemented by the theory of Sherrill (2008) which deals with strategies to enable a person achieve the stipulated rights. The target population was learners with visual impairments (LVI) from established integrated schools and from regular UPE schools, Teachers of LVI from established integrated schools and from regular UPE schools, head teachers from established integrated and regular UPE schools, plus inspectors of schools incharge od Special Needs Education. This paper presents findings obtained through a mixed method research design involving both qualitative and quantitative descriptive methods with a sample of 147 respondents. Raw data was obtained through questionnaires, interviews, observation and Focus Group Discussions (FGDs). Data obtained from close – ended items of the questionnaire were analyzed quantitatively, while data obtained from open ended items were analyzed qualitatively. Data collected using interview, observation and FGD was coded, quantified, categorized and analyzed following the themes derived from the research objectives. Findings were presented using descriptive methods. The main findings were that teachers of LVI in regular UPE schools generally lacked Braille skills, and even those from established integrated schools who possessed some Braille skills lacked skills in full mathematics Braille notation. Findings also revealed that regular UPE schools generally lacked optical devices, and the only adapted materials that were available were contrast enhanced chalkboards. Overall, the teachers in regular UPE schools generally lacked preparedness to teach LVI. The study recommends a full Braille course for teachers of LVI in regular UPE schools; and refresher courses in Full mathematics Braille notation for teachers in established integrated schools. The study also recommended local production of styluses, Abaci and shapes for LVI at low or no cost. This finding implied a need to guarantee specialized training to teachers of LVI, which would only be achieved through the provision of financial resources to support their preparedness.
Keywords: Assessment, Preparedness, Learners with visual impairments (LVI), Regular Universal Primary Education (UPE) schools, Established Integrated Schools
Preparedness: National Centre for Education Statistics(NCES) 2017 defines preparedness as the extent to which the teachers' training prepares them to meet challenges in the classroom. In the context of this study, it refers to the specialized skills that teachers should have to enable them meet the needs of LVI within the classroom setting.
Learners with Visual impairment (LVI): These are learners who have a limitation of one or more functions of the eye or visual system where the learner's eye sight can not be corrected to a normal level (An Azo network 2015). In this study, it is a general term that describes learners with a wide range of visual function, from low vision to total blindness.
Regular Universal Primary Education (UPE) schools: Schools which are meant for providing basic primary education to all Ugandan children of school going age; which is affordable by the government and majority of the citizens (UPE report 2012). In this study, it is used to mean government aided day schools which do not have a unit and boarding facility for LVI.
Established Integrated Schools: Refer to schools which have been in existence with an integrated system for a long time and therefore recognized and generally accepted. (Hacker 2015 in Mirriam Webster 2015). In context of this study, they are educational settings which are recognized by government as official schools for intergration of LVI together with the sighted, with a boarding facility and unit for LVI.

1. Background to the study

Globally, preparedness to teach children with visual impairments in school has been an area of concern and generally a subject of debate among educators worldwide. It even raises more concern among educators in the area of special needs education when it comes to preparedness to teach LVI especially within regular school settings. A number of studies globally, in Africa and in Uganda have revealed that some of the major obstacles in

teaching these learners in regular schools is limited specialized skills and adapted resources. (Njoroge 1991; McCall 2001; Kristensen, Omagor and Onen 2003; ICEVI 2005; Wamunyi 2008).

In Uganda, lack of adequate resourses remain a major challenge to access and retention of LVI in regular UPE schools. UPE is an educational program which was spearheaded by the president of Uganda His Excellency Yoweri Kaguta Museven. During his presidential campaigns in 1996, he pledged to offer free education to all school age going children of 6 – 12 years within government aided schools. Enrolment was to be done on the basis of four children per family, and priority was to be given to children with disabilities. This provision attracted many learners with disabilities including those with visual impairments into regular UPE schools (UNICEF report 2015). The Education For All (EFA) Global monitoring report (2012) specified that the enrolment level of learners with disabilities in UPE schools stood at almost 97% for primary education, and was projected it to reach 100% in the next four years if particular conditions are met.

Unfortunately, the learning needs of children with disabilities were not met. (Ministry of Education and Sports (MOES) Sector fact sheet 2000 – 2012; UPE report 2012). Wamunyi (2008) has cautioned educators that though mainstreaming is an advanced approach to the desired meaningful social inclusion of learners with special needs, placing them in regular classes without meeting their learning needs in full cannot be considered a step forward in Special Needs Education. The fact sheet also revealed that a large number of LVI who were enrolled in UPE schools eventually dropped out due to lack of attention. Review of Primary Living Examination (PLE) results exhibited by UNEB / SNE records (2008 – 2012) revealed that the educational achievement of LVI has been persistently low, as compared to their sighted counterparts. Despite the studies conducted on the education of learners with visual impairment in Uganda by Kristensen et al 2003 and by Lynch, McCall, Douglas, McLinden and Bayo 2011; none of them has paid attention to aspects of Braille skills of teachers; adapted materials, equipment and devices, or issues directly related to the classroom. This study examined the preparedness of teachers to teach learners with visual impairments in Regular Universal Primary Education (UPE) schools in South Western Uganda.

2.0 Objectives of the Study

The study was guided by the following objectives which sought to:

iii. Establish the Braille skills possessed by teachers of LVI in regular UPE schools;
iv. Determine the availability of adapted materials, equipment and devices for LVI.

3.0 Materials and methods

The study employed mixed methods research design also reffered to as multi – methodology to examine the preparedness of teachers to teach learners with visual impairments in Regular Universal Primary Education (UPE) schools in South Western Uganda. Mixed methods research design has been defined as integrating qualitative and quantitative data collection and analysis in a single study or a program of enquiry. (Creswel, Plano, Gutmann and Hanson 2003; in Tashakkori and Teddle 2003). The design was intended to produce good qualitative and quantitative information through the use of questionnaires, interviews, observation and Focus Group Discussions (FGDs) that collected information on the existing situation of LVI in regular UPE schools. Data that was obtained from close – ended items of the questionnaire were analyzed quantitatively, while data obtained from open ended items using interview, observation and FGD was coded, quantified, categorized and analyzed following the themes derived from the research objectives. The findings were reported in summary form using descriptive methods in tables.

4.0 Results and Discussion

4.1 Demographic data

Demographic data was discussed under the following subtitles: Prevalence of LVI in regular UPE schools, Years of teaching experience of teachers involved in the study, Demographic characteristics of teachers and LVI and Details about the type of schools and category respondents.

4.1.1 Prevalence of LVI per region

Table 4.1 Prevalence of LVI per region

Region	No. of children with disabilities	No. of LVI	Percentage of LVI
Central	35.347	10,604	30%
Eastern	61.035	280,76	46%
North Southern	2,801	980	35%
Northern	57,831	19,663	34%
South Western	22,572	124,15	55%

NB: Adapted from Uganda Education Statistics abstract 2009.

From table 4.1 above, the percentage of LVI among the number of children with disabilities ranged from 30% to 55%. The highest concertration of LVI was found to be in South Western Uganda, and that factor

prompted this study in the area.

4.1.2 Years of teaching experience of teachers involved in the study

Table 4.2: Years of teaching experience of teachers involved in the study

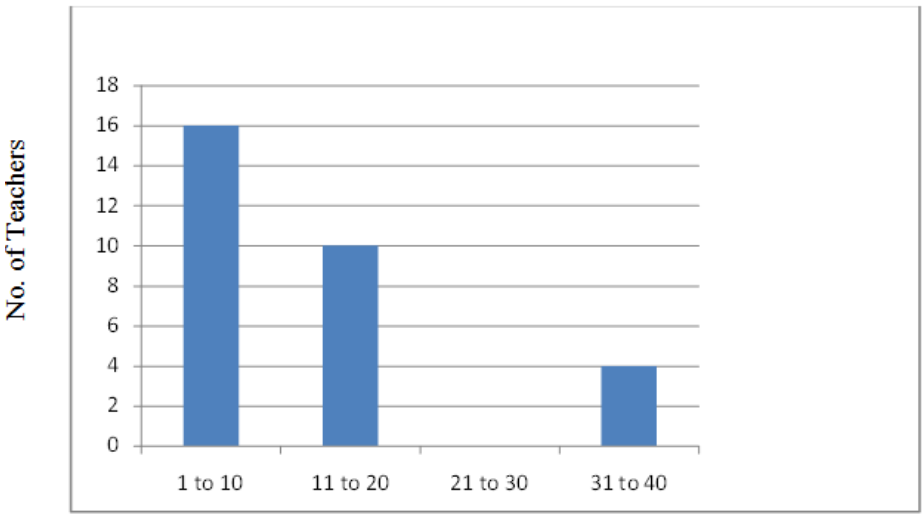

Table 4.2 shows the years of teaching experience categorized under 1 – 10 years, 11 – 20 years, 21 – 30 years and 31 – 40 years. This categorization was based on the argument that the longer the period of teaching, the more likely the teacher would acquire skills of teaching LVI. Findings indicate that more than half of the teachers who participated in the study had little experience in teaching as they had taught for 10 years or less. Less than half of the teachers had 11 – 20 years of teaching experience, and only very few teachers had more than 30 years of teaching experience.

4.1.3 Demographic characteristics of teachers and LVI

Table 4.3 Demographic characteristics of teachers and LVI

School type	**Established integrated schools**			**Regular UPE schools**						
School code	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Total No. of teachers per school	23	23	23	25	16	24	23	25	23	23
No. of teachers involved in study	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
No. of specialized teachers	4	5	5	0	0	0	0	0	0	0
Percentage of specialized teachers	**17%**	**22%**	**22%**	-	-	-	-	-	-	-
Years LVI had been in school	5	44	46	NS	NS	NS	NS	9	NS	NS
No. learners who were blind	11	21	22	0	0	0	0	0	0	0
No. learners with low vision	13	10	20	23	15	24	5	51	16	17
Total No. of LVI	**24**	**31**	**42**	**23**	**15**	**24**	**10**	**51**	**16**	**17**
No. of LVI involved in the study	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**

KEY: NS = Not sure

Table 4.3 shows that only less than a quarter of the teachers who participated in the study had special education qualifications, and they were all teaching in established integrated schools. None of the teachers with special education qualifications was teaching in regular UPE schools. The table also shows that all the learners who had been categorized as being blind were enrolled in established integrated schools and learners with low vision were enrolled in both school settings. Findings also revealed that LVI had been enrolled in established integrated schools B and C for more than 40 years, and 5 years in school A. However, headteachers from almost all the seven regular UPE schools were not sure of how long the LVI had been enrolled in their schools, which revealed that they were not bothered about taking care of the special educationasl needs of the leaners.

4.1.4 Details about the type of schools and category respondents

Table 4.4 Details about the type of schools and category of respondents

Area	**Target population**	**Study popn.**	**Sample size**
Districts	14	7	7
Government aided schools with LVI	35	10	10
Established integrated schools	3	3	3
Regular UPE schools with many LVI	32	7	7
Respondents			
Item	**Target population**	**Study popn.**	**Sample size**
LVI from established integrated schools	97	97	24
LVI from regular UPE schools	1,344	156	56
Sub – total	**1,441**	**253**	**80**
Teachers of LVI in Establi. integrated schools	69	69	15
Teachers of LVI in regular UPE schools where LVI had been enrolled in large numbers	736	159	35
Sub – total	**805**	**228**	**50**
Head teachers of Establi. Integrated schools	3	3	3
Head teachers of regular UPE schools with large numbers of LVI	*32*	7	7
Sub – total	***35***	**10**	**10**
Inspectors of schools in charge of SNE	**14**	**7**	**7**
Total	**2,295**	**498**	**147**

From table 4.4, the details about the type of schools used for the study and the category of respondents have been shown, whereby the government aided schools with high concertration of LVI totaled to 10, among which 3 were established intergrated schools and 7 were regular UPE schools. The category and numbers of the people who participated in the study is also presented, all making a total of 147 respondents. The detailed demographic data of participants such as names were not taken due to ethical considerations.

4.2 Determination of strategies for enhancing access and retention of LVI in regular UPE schools

The task of the study was to determine thepreparedness of teachers to teach LVI in regular UPE schools. The indicators of preparedness included: Braille skills possessed by teachers, and availability of adapted materials, equipment and devices for LVI.

4.2.1 Braille skills possessed by teachers of LVI in regular UPE schools;

This objective sought to establish the Braille skills possessed by teachers of LVI in regular UPE schools. To achieve this objective, question ii of section C in the questionnaire required teachers to indicate the level of their Braille skills under the variables: Grade I English Braille, Grade II English Braille, Simple mathematics Braille; and Full mathematics Braille notation. The study established that there was no teacher who possessed any Braille skills in all the seven regular UPE schools. The study also established that all the teachers who possessed Braille skills were teaching in established integrated schools, and they all possessed skills in Grade 1 English Braille. Majority of them possessed skills in Grade II English Braille and Simple mathematics Braille, and very few of them possessed skills in full mathematics Braille notation as indicated in table 4:5 below:

Table 4.5: Teachers' Braille skills

School Type	**Established integrated schools**			**Regular UPE schools**						
School code	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Total No. of teachers	**23**	**23**	**23**	**25**	**16**	**24**	**23**	**25**	**23**	**23**
No. teachers involved in study	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Teacher's level of English Braille										
Grade 1 English Braille	4	5	5	0	0	0	0	0	0	0
Grade II English Braille	3	4	4	0	0	0	0	0	0	0
Teacher's level of mathematics Braille										
Simple Maths Braille	3	4	4	0	0	0	0	0	0	0
Full Maths Braille Notation	1	2	2	0	0	0	0	0	0	0

Findings also revealed that all the teachers who possessed Braille skills were teaching in established integrated schools, and there were no teachers with Braille skills in all the seven regular UPE schools. This finding is in agreement with Frieman 2004 who noted that school administrators are faced with the challenge of finding competent teachers who have expertise in Braille to teach LVI. Findings also revealed that all the teachers who possessed Braille skills had skills in Grade I English Braille. More than three quarters had skills in

Grade II English Braille and simple mathematics Braille. However, less than a half had skills in full mathematics Braille notation. This finding was different from the finding by Nzoka (2011) which concluded that majority of the specialized teachers in Kenya lacked proficiency in Grade two English Braille. The finding however confirms findings of a study by Demario, Norma, Lian and Ming – Gon (2000) who conducted a study to examine the competency of teachers in Full mathematics notation, and found out that the teachers lacked competency in more than a half of the required mathematics skills. The concern of lack of proficiency in some aspects of Braille skills by teachers was expressed by the Inspector of schools in charge of SNE in district A. During an interview, he expressed his opinion about lack of specialization of teachers trained in Special Needs Education in Uganda with effect from the year 2000. He commented that:

> *" Since 2000, teachers who were graduating in Special needs Education are mixed up. They do not have sufficient knowledge in a particular area because they did not specialize. For example a graduate with a diploma in Special Needs Education is assumed to have acquired knowledge in all special Needs areas of Sign language, Braille and Learning disabilities. However, studying all the areas without specializing in a particular area leaves a teacher with limited knowledge in all the areas."*

This finding exposed a dire need for exposure to a full Braille course for teachers of LVI in regular UPE schools, and refresher courses in full mathematics Braille notation for teachers of LVI particularly in established integrated schools. The necessity for teachers to go through a specialized and comprehensive Braille training course has been recommended by literature reviewed in this study by (Amato 2002; Frieman 2004; Hui Ying Hung 2008, Johnson 1996, McCall 2001, Allman, Carol, Holbrook and M.Cay 1999, Knowlton and Berger 1999).

4.2.2 Availability of adapted materials, equipment and devices for LVI

This objective sought to determine the availability of adapted materials, equipment and devices for LVI. To achieve this objective, Data was collected through questionnaires, FGDs and observation. Section D of the teachers' questionnaire asked teachers to indicate the number of adapted materials, equipment and devices available in their classrooms and the number required.

Findings indicated that the only adapted equipment that was available in all the seven regular UPE schools was Contrast enhanced chalkboards. The study further established that the materials for learners with low vision that were available in all the three established integrated schools were optical devices and large beamed hats. Large print text books and felt – tip /thick pens were the lacking in all the ten participating schools. Other low vision materials were generally lacking in both school settings.

The study established that there were no basic Braille materials available in all the seven regular UPE schools, and that there were some available in the three established integrated schools. The findings were summarized in tables 4.6 and 4.7 below:

Table 4.6: Basic Braille materials and equipment

Established integrated Schools	**A**			**B**			**C**		
Type of material	**No. required**	**No. available**	**Situ - ation**	**No. required**	**No. availa- ble**	**Situ - ation**	**No. Req.**	**No. availa- ble**	**Situ – ation**
Basic Reading and Writing Braille Equipment									
Slates	11	20	**+9**	21	30	**+9**	20	36	**+16**
Styluses	11	7	**-4**	21	12	**-9**	20	24	**+4**
Cubes (sets)	11	00	**-11**	21	8	**-13**	20	9	**-11**
Cube flames (sets)	11	00	**-11**	21	8	**-13**	20	9	**-11**
Braille paper (reams)	11	15	**+4**	21	23	**+2**	20	30	**+10**
Perkins Braillers	11	5	**-6**	21	10	**-11**	20	15	**-5**
Marburg	11	00	**-11**	21	2	**-19**	20	3	**-17**
English Braille text books pupil's copies	11	00	**-11**	21	00	**-21**	20	00	**-20**
English Braille text books trs' copies	5	4	**-1**	5	4	**-1**	5	6	**+1**
Braille readinessMaterials (sets)	11	00	**-11**	21	2	**-19**	20	1	**-19**
Drawing kits (sets)	11	9	**-2**	21	18	**-3**	20	23	**+3**
Basic Mathematics Braille Equipment									
Abaci	11	6	**-5**	21	9	**-12**	20	24	**+4**
Tailor flames	11	00	**-11**	21	8	**-13**	20	6	**-14**
Tailor types (sets)	11	00	**-11**	21	8	**-13**	20	6	**-14**
Measuring devices (Rulers, compass, protractor) (sets)	11	10	**-1**	21	19	**-2**	20	23	**+3**
Mtc Braille text book teachers' guide	5	00	**-5**	5	00	**-5**	5	00	**-5**
Shapes (sets)	11	5	**-11**	21	10	**-11**	20	24	**+4**

English Braille text books pupils' copies and **mathematics Braille text books teacher's guide** were the most lacking items, with no item in all the 3 established integrated schools. During an interview, the headteacher of school C reported that:

> *"The only copy of mathematics Braille notation that is available is an unpublished manual, and specialized teachers have always complained that some concepts are not practically applicable when teaching mathematics to LVI. Recently, one of them expressed his wish to get in touch with the author of the unpublished manual so that they could edit the book."*

The important finding of this objective was that even the established integrated schools lacked some of the Basic Braille materials and equipment for LVI.

Table 4.7: Basic Low Vision materials, equipment and devices

Type of school	Established integrated schools						Regular UPE schools													
school code	A		B		C		D		E		F		G		H		I		J	
	NR	NA	NR	NA	NR	NA	NR	NA	NR	NA	NR	NA	NR	NA	NR	NA	NR	NA	NR	NA
Major materials / equipment for low vision																				
Large print textbooks	13	0	10	0	20	0	23	0	15	0	24	0	5	0	51	0	16	0	17	0
Felt-tip/ thick pens	13	0	10	0	20	0	23	0	15	0	24	0	5	0	51	0	16	0	17	0
Large beamed hats	2	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
Contrast enhanced chalkboards	7	5	7	4	7	5	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Major optical devices																				
Magnifying glasses	13	13	10	10	20	20	23	0	13	0	24	0	5	0	51	0	16	0	17	0
Telescopes	13	13	10	10	20	20	23	0	15	0	24	0	5	0	51	0	16	0	17	0
Lenses/ spectacles	1	1	2	2	3	3	NS	0	NS	0	NS	0	NS	0	NS	0	NS	0	NS	0
Contrast enhanced glasses	13	13	10	10	20	20	23	0	15	0	24	0	5	0	51	0	16	0	17	0

NR	Number required
NA	Number available
NS	Not sure

The findings from table 4.7 revealed that all the seven regular UPE schools had enough contrast enhanced chalkboards, but the three established integrated schools did not have enough. Findings also revealed that the three established integrated schools had enough of the required optical devices (Magnifying glasses, telescopes, lenses/spectacles, contrast enhanced glasses and large beamed hearts). The above findings indicated that the low vision devices available in established integrated schools were largely optical devices. However, all the seven regular UPE schools did not have any optical device, yet a big number of LVI in the schools were in need of them. This finding contradicts the recommendation by Eschenbach 2011; Erin 2003; and Arter 2001; who recommended the use of low vision devices to help students maximize their remaining vision in order to train the brain to interpret images more easily. The study further revealed that LVI from the regular UPE schools did not have access to the optical devices because they were not entitled to comprehensive eye care services which were being offered by a project that was based in the area of study. The project provided eye care services to only LVI enrolled in established integrated schools (schools which had units); leaving out the regular UPE schools. The comprehensive eye care services which the project provided included: Diagnosis of eye conditions, assessment of visual functioning, treatment, provision of optical devices, and training teachers on how to help the children use the optical devices provided. This finding exposed the educational benefits which the LVI from regular UPE schools were missing by not being able to access the above services, particularly the optical devices. As confirmed in a study by Eschenbach (2011) which examined the benefits of using optical devices, they were clinically proven to work, and increased the speed of reading of almost all the study participants.

Findings also revealed that Large print text books and felt – tip /thick pens were lacking in all the ten participating schools including the established integrated schools. This finding indicated that other educational materials of learners with low vision apart from optical devices were not being taken into consideration. During FGDs, learners with low vision gave their views on other materials which they preferred to use. The materials included: Hand held magnifiers and large books to enable them write large print and thick writing materials.

5.0 Conclusion

In this study, the determinants of teachers' preparedness to teach LVI in regular UPE schools were Braille skills of teachers and availability of adapted materials, equipment and devices for LVI.

Regarding Braille skills for teachers, the study concluded that all the teachers of LVI In all the seven regular UPE schools lacked Braille skills. Teachers who possessed Braille skills were teaching in established integrated schools, but still very few of them had skills in full mathematics Braille notation.

Regarding adapted materials, equipment and devices, the study concluded that the only adapted materials that were available in all the regular UPE schools were contrast enhanced chalkboards, but Optical devices were sufficiently available only in established integrated schools. The regular UPE schools lacked optical devices because they were not beneficiaries of the eye care project which was donating comprehensive eye care services including optical / low vision devices, and parents of LVI in these schools were so poor that they could not afford to buy these devices. Other low vision materials were generally lacking in both school settings. All the regular UPE schools lacked basic Braille materials and equipment. Some basic Braille materials were available in the all the three established integrated schools but most of them were not enough, and some of them were completely lacking. The study indicated that overall, the teachers were generally not prepared to teach LVI in regular UPE schools.

The contention of the researcher is that there is urgent need to improve the quality of education for LVI in regular UPE schools. This requires the intervention on the provision of Braille and adapted teaching and learning materials as discussed in this study. The implication is that LVI are greatly disadvantaged when this observation is not realized; and they can not compete at the same level with their sighted counterparts.

In view of the above conclusions, it is clear that the study achieved its purpose which were stated in two objectives as shown in chapter one and analyzed in chapter four. The study gaps were further filled by the information obtained from the research instruments namely: questionnaire, interview schedules, Focus Group Discussion guides and observation schedules.

6.0: Recommendations

Based on the findings, the following was recommended:

- A full Braille course for teachers of LVI in regular UPE schools; and refresher courses in Full mathematics Braille notation for teachers in established integrated schools. The implementation of the above trainings should be taken up by individual districts.
- Government through the Ministry of Gender, Labour and Social Development should use the existing established workshops that were established for the rehabilitation of persons with disabilities in the country to produce styluses, Abaci and shapes and mobility long canes for LVI at low or no cost.

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Appendix 1: Map of Uganda Showing the Area of Study

KEY: **South Western Uganda**