Teachers' Methodologies and Sources of Information on HIV/AIDS for Students with Visual Impairments in Selected Residential and Integrated Schools in Ghana

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Abstract

This study reports part of a national survey on sources of information, education and communication materials on HIV/AIDS available to students with visual impairments in residential, segregated, and integrated schools in Ghana. A multi-staged stratified random sampling procedure and a purposive and simple random sampling approach, where appropriate, were used to select 83 students with visual impairments to participate in a survey. Descriptive and inferential statistics, including frequency distribution, percentages, and chi-square (X^2) test, were used to analyze the data. The findings revealed that teachers used a variety of sources of information such as newspapers, storybooks, prescribed textbooks and recorded materials, and workplace HIV/AIDS policies to teach HIV/AIDS lessons to students with visual impairments. Additionally, teachers relied more on discussion, storytelling and lecture method, rather than interactive methodologies to teach HIV/AIDS lessons. Chi-square (X^2) computation at .05 significant level revealed that none of the students' responses was independent on gender. Recommendations were offered to the Ghana's Ministry of Education for consideration.

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In Ghana, activities related to prevention and intervention of human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) have been incorporated into the curriculum of educational institutions from the basic school level, through the second cycle schools to the tertiary level. These are done either through integration or infusion or as a stand-alone course. By integration, HIV/AIDS issues and activities are discussed in appropriate subjects, such as Health Science and Social Studies, which lend themselves to the teaching of HIV/AIDS issues. With regards to infusion, HIV/AIDS issues are strategically raised and discussed within a topic during lesson delivery because the subject, for example, Mathematics, does not lend itself easily to addressing health-related topics.

These measures were introduced to fulfill the 9th policy goal of the Education Strategic Plan of Ghana's Ministry of Education (MOE), which sets to identify and promote education programmes that will assist in the prevention and management of HIV/AIDS (Ministry of Education [MOE], 2003). As part of this policy goal, institutional and teacher-training curricula were to be reviewed to include aspects of HIV/AIDS awareness, prevention, and management at all levels, with an emphasis on behavioural change. Courses in HIV/AIDS prevention, counselling, care and support, and management have been provided for workers and practicing

teachers. The Ministry of Education further proposed the institution of Information, Education and Communication (IEC) programmes for HIV/AIDS by 2004, as well as encourage the formation of HIV/AIDS clubs and other relevant initiatives at all levels of education in the country.

Additionally, the MOE and the Ghana Education Service (GES) have implemented the Population and Family Life Education (POP/FLE) programme and the integrated HIV/AIDS topics in curricula for pre-tertiary institutions. The African Youth Alliance (AYA) scaled up the POP/FLE in a project under the United Nations Population Fund (UNFP) to improve adolescent sexuality and reproductive health (ASRA) status in basic schools in 20 districts in 10 regions of the country.

Besides, the Ministry of Health has also initiated and implemented youth-based services at some health centres. In 1996, the Planned Parenthood Association of Ghana [PPAG] designed and implemented youth-specific programmes by building youth-friendly service centers in four administrative regions: Greater Accra, Volta, Ashanti and Northern. These centers provide a variety of sexual and reproductive health services for young people, including information, counselling, family planning and post-abortion care (Awusabo-Asare, Abane & Kumi-Kyereme, 2004). Regrettably, none of these initiatives and agencies made provisions for individuals with disabilities, including those with visually impairments and blindness. The trend of educating individuals with visual impairments and blindness has been discussed to enhance understanding of the study.

Ghana's education system consists of a three-level structure: basic education, secondary education, and tertiary education. The basic education level comprises 2-year preschool, 6-year primary and 3-year junior high school. The secondary education level includes senior high, vocational, and technical education. Tertiary education consists of colleges of education, polytechnics and universities. In terms of educating learners who are visually impaired or blind, historically, Ghana has provided two residential special schools for the blind (Avoke, 2008). Over the last decade, however, three pilot integrated basic schools have been added to the two residential schools. At the secondary level, there are six integrated senior high schools for students with visual impairment; and three of the six schools are still at the pilot stage. Besides, there are two colleges of education that enroll a few individuals with visual impairment in their pre-teacher preparation programs. Ghana has adopted the integration model for educating individuals with visual impairments and blindness following becoming a signatory to the Salamanca Accord in 1994.

Besides, in Ghana, the MOE has overall responsibility for education sector policy, planning and monitoring. Education delivery and implementation is devolved to institutions, districts and regions through various agencies of the MOE. The Ghana Education Service (GES) is the agency that implements the Basic and Senior Secondary education components, including Technical and Vocational education (MOE, 2003).

The term visual impairment covers a wide variety of conditions, some present since birth and some resulting from gradual deterioration of sight. The vast majority of individuals with visual impairment have some useful residual vision, although the degree of vision can vary greatly.

Some are able to read newsprint, whilst others need large print of varying sizes (British Educational Communications & Technology Agency, 2000). A minority of individuals with visual impairment relies on non-sighted methods of reading and writing, such as Braille, touch typing and Moon. Interestingly, only 7% of registered individuals with visual impairments use Braille (British Educational Communications & Technology Agency).

Also, the type of partial sight from which a learner may suffer is extremely varied, reflecting the sources of different eye complaints which exist. It is therefore important, before starting any teaching programme, to establish a student's degree of useful vision, and determine what lighting conditions suit best and what methods are to be used for reading and writing. Essentially, the effects of visual impairment on both literacy and numeracy are complex. All reading and written tasks are made slower and more difficult by visual impairment (British Educational Communications & Technology Agency, 2000).

Students with visual impairment access information in different ways, for example Braille, audio, or enlarged print. Braille readers cannot skim read and may take up to three times as long as other students to read a text (California Department of Social Services, 2009). Also, students with low vision may be large-print readers or may not be able to read at all without using special computer software or equipment (California Department of Social Services). Teachers of students with visual impairments have to take these characteristics into consideration when designing, selecting and using information, education and materials for teaching such learners.

Besides, it takes longer for students with visual impairments to write down lecture notes and they may be unable to see PowerPoint slides or board work. Besides, some students with visual impairment may be sensitive to light or screen glare and therefore struggle with television and video conference. In line with this, several methods should be made available for people with visual impairments and blindness, who cannot read standard print to obtain information. Some alternatives to standard print are large print, Braille, recorded material, and computer-produced synthesized speech (California Department of Social Services, 2009).

Studies in South Africa, Uganda, Senegal and Zimbabwe, have reported that youngsters with visual impairments have many mistaken ideas about HIV/AIDS and sexuality because they have less access to information on HIV/AIDS and sexuality than do their peers without disabilities (Groce, 2003; IRIN & Plusnews, 2008; Kudzai, 2003). In Kenya, seminars organized by and for individuals who are visually impaired reported a lack of knowledge and access to information on HIV/AIDS among persons with visual impairments (NACC, 2006). Regrettably, other studies have revealed that special schools are excluded from prevention campaigns or lack sex education (Hanass-Hancook, 2009; Hanass-Hancook, 2008; Wazakili, Mpofu, & Devlieger, 2009; Dickman, Roux, Manson, Douglas, & Shabalala, 2006; Dube, 2004). Otte, Mass, and Boer (2008) also argue that participants with visual impairments accessed HIV/AIDS information mainly through spoken channels, via churches and mosques, whereas participants without disabilities accessed such information from posters, billboards, and other visual displays. Otte and colleagues reported in their survey that adolescents with blindness are prone to believing in wrong modes of transmission and prevention. However, in Ghana, most of the alternatives modes for transmitting information are not available for learners with visual impairments.

As part of the campaign to reduce the spread of HIV/AIDS, the MOE and the GES, have incorporated information on HIV into the curricula of all the levels of education in the country. Teachers adopt difference instructional approaches to teach topics on HIV/AIDS to students at all levels of education. However, since visual impairment adversely affect learning and in particular access to information teachers adopt and adapt methods, resources and materials to enable students who have lost their sight have access to information and participate successfully in learning. The aim of the study was to explore teachers' methodology and sources of information on HIV/AIDS for students with visual impairments in selected residential special and integrated senior high schools for learners with visual impairments and blindness in Ghana. The main objective of the study was to establish teachers' methodology and sources of information on HIV/AIDS for students with visual impairments in segregated and integrated schools in Ghana. Specifically, the study sought to (1) describe sources of information teachers use to teach students with visual impairments about HIV/AIDS in the selected residential and integrated schools in Ghana; (2) discuss the methods teachers employ in teaching HIV/AIDS lessons to students with visual impairments ; (3) examine the gaps in the sources of information and methods for teaching HIV/AIDS lessons to students with visual impairments; and (4) make recommendations to the MOE and the GES to improve sources of information and methods for teaching HIV/AIDS lessons to students with visual impairments. It was also hypothesized that there would be no significant differences in the responses of male students from the responses of their female counterparts to the issues raised.

Method

This study adopted the cross-sectional survey design, which involved the collection of data at one point in time (Creswell, 2005) from students with visual impairments (blind and low vision), and who then attending the two residential basic special schools for the blind, and the three well established integrated senior high schools in Ghana. All 278 possible participants were using Braille for reading and writing. The sample of 83 for the study was determined by using a table designed by Krejcie and Morgan (cited in Sarantakos, 1993). Their table gives figures for population ranging from 10 to 1,000,000 subjects and the corresponding figures for the required sample size. This table computes the sample size by means of a formula based on a chi-square with 1 degree of freedom, the population size, the population proportion at .50, and a degree of accuracy at .05. The formula, which was developed by the research division of the National Education Association (USA), is as follows: $S = \underline{X^{2NP}\ (1\text{-}P)} + X^{2P}\ (1\text{-}P)$, $d^2 = (N\text{-}1)$, where S is the required sample size, x^2 the table value of chi-square for 1 degree of freedom (3,841), N the population size, P the population proportion, and d the degree of accuracy.
Based on the table used by Krejcie and Morgan (1970), 83 of the students were chosen from an accessible population of 278, which agrees with the figure recommended by Krejcie and Morgan. Since the schools are widely separated, the researchers purposefully mixed and selected one residential basic and one integrated senior high school.

Research Instruments
The researchers employed two sets of questionnaire for data collection; namely, students' questionnaire and teachers' questionnaire. The World Health Organization's AIDS/KABP survey (World Health Organization/GP/SBR, 1988), which had been adapted by Ocansey (2006), was adapted further to suit learners with visual impairments. The instrument had six sections, but this

report focused on three sections A, E and F, and these addressed (a) participants' demographic characteristics, (b) pedagogical strategies, and (c) IEC materials used for teaching HIV/AIDS lessons in special schools. The Cronbach Alpha reliability co-efficient of the pupils' questionnaire was r =.76, while the teachers' questionnaire yielded r=.82. Additionally, the instruments were piloted to foster clarity and enhance reliability. A team of research assistants, who were proficient and skillful in Braille writing and reading, were trained to assist in the data collection. The questionnaires for all participants were hand-delivered by the research team. Prior to the visit to the schools, permission was sought from the relevant authorities including the District Directors of Education and the heads of the selected educational institutions. All participants independently completed the questionnaire, and the research assistants collected them after one week.

Data Analysis

As a descriptive survey study, both descriptive and inferential statistics were used. Frequency distribution, percentages, and chi-square (X^2) test, were used to analyze the data. All the data were subsequently presented as tables. Qualitative interpretation was given to the results to facilitate discussion, conclusions and recommendations.

Results

Table 1 highlights teaching and learning resources for teaching HIV/AIDS lessons to students with visual impairments.

Table 1

Teaching/Learning resources for teaching HIV/AIDS lessons to students with visual impairment

Item	Response	Male (n = 55)		Female (n= 28)		Total (N = 83)		(X^2)	Sig
		No.	%	No.	%	No.	%		
Video and film show	Yes	19	34.5	11	39.3	30	36.1	.181	.671
	No	36	65.5	17	60.7	53	63.9		
Resource person	Yes	28	50.9	20	71.4	48	57.8	3.203	.073
	No	27	49.1	8	28.6	35	42.2		
Posters and banners	Yes	19	34.5	8	28.6	27	32.5	.302	.583
	No	36	65.5	20	71.4	56	67.5		
Prescribed HIV/AIDS textbooks	Yes	28	50.9	16	57.1	44	53.0	.289	.591
	No	27	49.1	12	42.9	39	47.0		
Reference materials	Yes	33	60.0	14	50.0	47	56.2	.755	.385
	No	22	40.0	14	50.0	36	43.4		
Only pamphlets	Yes	16	29.1	62	1.4	22	26.5	.559	.455
	No	39	70.9	22	78.6	61	73.5		
Prescribed syllabus	Yes	39	70.9	18	64.3	57	68.7	.378	.538
	No	16	29.1	10	35.7	26	31.3		
Basic School HIV/AIDS Education Syllabus	Yes	33	60.0	19	67.9	52	62.7	.490	.484
	No	22	40.0	9	32.1	31	37.3		

Tape Recorders and	Yes	29	52.7	14	50.0	43	51.8	.055	.814
Cassettes	No	26	47.3	14	50.0	40	48.2		
Newspaper information &	Yes	38	69.1	20	71.4	58	69.9	.048	.826
storybooks	No	17	30.9	8	28.6	25	30.1		
Use of Examples	Yes	32	58.2	20	71.4	52	62.7	1.391	.238
	No	23	41.8	8	28.6	31	37.3		
Workplace	Yes	22	40.0	12	42.9	34	41.0	.063	.802
HIV/AIDS policy	No	33	60.0	16	57.1	49	59.0		

From Table 1, 69.9% of the students with visual impairment reportedly stated that their teachers used newspaper information and story books to teach HIV/AIDS lessons, and in terms of gender, 69.1% female and 71.4% males responded 'yes' to the use of newspapers. Also, 68.7% of them mentioned the use of prescribed syllabus, with 70.9% females and 64.3% males responding 'yes'. Additionally, 62.7% of the students reported that their teachers used examples and Basic School HIV/AIDS Education Syllabus respectively, and with respect to gender, 60% of the females and 67.9% of the males responded 'yes'. Again, 57.8% stated that resource persons were involved in the dissemination of HIV/AIDS information, and for that 50.9% of the females and 71.4% of the male participants said 'yes'. With regards to the availability of reference materials, 56.6% of the participants mentioned answered in the positive; specifically, 53% selected prescribed HIV/AIDS Textbooks, and 51.8% indicated tape recorders and cassettes. Other sources of information participants indicated include workplace HIV/AIDS Policy (41%), video and film shows (36.1%), posters and banners (32.5%), and pamphlets (26.5%).

The Chi-square (X^2) computation at .05 significant level indicated no significant differences in male and female students' responses and the null hypotheses were upheld. Specific areas of non-significance were video and film $X^2(1, N = 83) = .181$, $p = .671$; resource person $X^2 (1, N = 83) = 3.202$, $p = .073$; posters and banners $X^2(1, N = 83) = .302$, $p = .583$; prescribed HIV/AIDS textbooks $X^2 (1, N = 83) = .289$, $p = .591$. Thus the null hypotheses were all upheld; there were no differences between male and female students' responses about with respect to their teachers' usage of the mentioned sources for information on HIV/AIDS.

Table (2) highlights the interactive techniques and approaches teachers use to teach HIV/AIDS lessons to students with visual impairments in the selected schools.

Table 2

Interactive techniques and approaches teachers use to teach HIV/AIDS lessons to Students with visual impairment

Item	Sex	Response Never		To a limited extent		To a large extent		To a very large extent		X^2	Sig
		No.	%	No.	%	No.	%	No.	%		
Discussion	M	22	40.0	13	23.6	7	12.7	13	23.6	.344	.952
	F	10	35.7	8	28.6	3	10.7	7	25.0		
	T	32	38.6	21	25.3	10	12.0	20	24.1		
Inquiry/discovery	M	36	65.5	6	10.9	7	12.7	6	10.9	1.103	.776
	F	16	57.1	3	10.7	6	21.4	3	10.7		
	T	52	62.7	9	10.8	13	15.7	9	10.8		

Lecture	M	25	45.5	9	16.4	8	14.5	13	23.6	.661	.882
	F	14	50.0	3	10.7	5	17.9	6	21.4		
	T	39	47.0	12	14.5	13	15.7	19	22.9		
Role play	M	33	60.0	10	18.2	6	10.9	6	10.9	4.812	.186
	F	12	42.9	6	21.4	8	28.6	2	7.1		
	T	45	54.2	16	19.3	14	16.9	8	9.6		
Simulation	M	45	81.8	6	10.9	1	1.8	3	5.5	3.516	.319
	F	21	75.0	2	7.1	3	10.7	2	7.1		
	T	66	79.5	8	9.6	4	4.8	5	6.0		
Critical incident	M	41	74.5	6	10.9	6	10.9	2	3.6	1.834	.608
	F	21	75.0	1	3.6	4	14.3	2	7.1		
	T	62	74.7	7	8.4	10	12.0	4	4.8		
Storytelling	M	27	49.1	11	20.0	7	12.7	10	18.2	3.159	.368
	F	11	39.3	3	10.7	6	21.4	8	28.6		
	T	38	45.8	14	16.9	13	15.7	18	21.7		
Field visits	M	40	72.7	8	14.5	6	10.9	1	1.8	5.251	.154
	F	18	64.3	4	14.3	2	7.1	4	14.3		
	T	58	69.9	12	14.5	8	9.6	5	6.0		
Dramatization	M	40	72.7	8	14.5	4	7.3	3	5.5	3.654	.301
	F	20	71.4	3	10.7	5	17.9	0	0.0		
	T	60	72.3	11	13.3	9	10.8	3	3.6		
Case study	M	44	80.0	4	7.3	3	5.5	4	7.3	3.242	.356
	F	24	85.7	0	0.0	3	10.7	1	3.6		
	T	68	81.9	4	4.8	6	7.2	5	6.0		
Video	M	42	76.4	6	10.9	2	3.6	5	9.1	4.988	.173
	F	19	67.9	2	7.1	5	17.9	2	7.1		
	T	61	73.5	8	9.6	7	8.4	7	8.4		
Lecturettes	M	48	87.3	2	3.6	4	7.3	1	1.8	.243	.970
	F	24	85.7	1	3.6	2	7.1	1	3.6		
	T	72	86.7	3	3.6	6	7.2	2	2.4		
Demonstration	M	40	72.7	5	9.1	6	10.9	4	7.3	1.485	.686
	F	23	82.1	2	7.1	1	3.6	2	7.1		
	T	63	75.9	7	8.4	7	8.4	6	7.2		
Brain storm	M	44	80.0	4	7.3	2	3.6	5	9.1	.483	.923
	F	23	82.1	1	3.6	1	3.6	3	10.7		
	T	67	80.7	5	6.0	3	3.6	8	9.6		
Plenary discussion	M	45	81.8	5	9.1	3	5.5	2	3.6	.669	.880
	F	22	78.6	2	7.1	2	7.1	2	7.1		
	T	67	80.7	7	8.4	5	6.0	4	4.8		
Panel discussion	M	46	83.6	4	7.3	2	3.6	3	5.5	.988	.804
	F	23	82.1	1	3.6	2	7.1	2	7.1		
	T	69	83.1	5	6.0	4	4.8	5	6.0		
Jigsaw technique	M	52	94.5	3	5.5	0	0.0	0	0.0	.143	.705
	F	27	96.4	1	3.6	0	0.0	0	0.0		
	T	79	95.2	4	4.8	0	0.0	0	0.0		

fish bowl	M	53	96.4	1	1.8	0	0.0	1	1.8	1.043	.594
techniques	F	28	100.0	0	0.0	0	0.0	0	0.0		
	T	81	97.6	1	1.2	0	0.0	1	1.2		
ice breakers	M	53	96.4	2	3.6	0	0.0	0	0.0	2.982	.225
	F	27	96.4	0	0.0	1	3.6	0	0.0		
	T	80	96.4	2	2.4	1	1.2	0	0.0		
small group	M	50	90.9	2	3.6	1	1.8	2	3.6	2.688	.442
	F	23	82.1	2	7.1	0	0.0	3	10.7		
	T	73	88.0	4	4.8	1	1.2	5	6.0		

Fieldwork

Table 2 shows that only 38% of the students stated that their teachers used discussion as an approach for teaching HIV/AIDS lessons; interactive techniques and approaches such as fish bowl techniques to teach HIV/AIDS lessons; 26.5% of them said their teachers used inquiry/discovery or role play respectively; 10.8% mentioned simulation; 16.8% stated critical incident; 37.4% indicated storytelling; 15.6% mentioned field visits and demonstration respectively; while14.4% said their teachers employed dramatization, 13.2% case study, 16.8% video, 9.6% lecturettes, 13.2% brainstorm, 10.8% plenary discussion and panel discussion respectively. Also, while all the students stated that none of their teachers employed the use of jigsaw technique, only 7.2% and 1.2% stated that their teachers used small group and fish bowl techniques respectively to teach HIV/AIDS lessons.

As to whether male and female respondents shared the same sentiments, Table (2) shows that 40% of the males and 35.7% of the females responded that their teachers never used discussion. A chi square at .05 significance level to test if participants responses' was based on their gender differences indicated a value of .344 and a significance value of .952; $X^2(1, N = 83) = .344$, $p = .952$, which upheld the null hypotheses that gender was not a factor. Thus there were no significance differences between the responses of male and female students in the study. In other words both male and female students took a common stance in responding that their teachers never used the discussion method in teaching. Indeed, the Chi-square (X^2) computation of the responses from the students at the .05 significant level suggested that, like discussion method, students responses with respect to all other methods, were not influenced by their gender.

Table 3 describes the sources of information on HIV/AIDS available to students with visual impairment in schools involved in the study.

Table 3
Sources of information on HIV/AIDS available to students with visual impairment

Item	Response	Male (n = 55)		Female (n= 28)		Total (N = 83)		(X^2)	Sig
		No.	%	No.	%	No.	%		
Radio	Yes	48	87.3	19	67.9	67	80.7	4.495	.034
	No	7	12.7	9	32.1	16	19.3		
TV	Yes	41	74.5	17	60.7	58	69.9	1.686	.194
	No	14	25.5	11	39.3	25	30.1		
Newspaper	Yes	34	61.8	17	60.7	51	61.4	.101	.922
	No	21	38.2	11	39.3	32	38.6		
Books	Yes	39	70.9	17	60.7	56	67.5	.879	.349
	No	16	29.1	11	39.3	27	32.5		
Church Leaders	Yes	30	54.5	18	64.3	48	57.8	.722	.396
	No	25	45.5	10	35.7	35	42.2		
Parents	Yes	46	83.6	26	92.9	72	86.7	1.372	.241
	No	9	16.4	2	7.1	11	13.3		
Brothers & Sisters	Yes	42	76.4	26	92.9	68	81.9	3.409	.065
	No	13	23.6	2	7.1	15	18.1		
Guidance Coordinator	Yes	22	40.0	13	46.4	35	42.2	.314	.575
	No	33	60.0	15	53.6	48	57.8		
Teachers	Yes	52	94.5	21	75.0	73	88.0	6.689	.010
	No	3	5.5	7	25.0	10	12.0		
Friends	Yes	40	72.7	23	82.1	63	75.9	.899	.343
	No	15	27.3	5	17.9	20	24.1		
Signboards/Billboards	Yes	20	36.4	10	35.7	30	36.1	.003	.954
	No	35	63.6	18	64.3	53	63.9		
internet	Yes	24	43.6	15	53.6	39	47.0	.735	.391
	No	31	56.4	13	46.4	44	53.0		

Fieldwork

Table 3, reveals sources from which students who are blind obtain information on HIV/AIDS, in the order of popularity; according to the students, 88% of them obtained information from their teachers, 86.7% from parents, 81.9% brother and sisters, 80.7% from radio, 75.9% friends, 69.9% TV, 67.5% from books, 61.4% newspaper, 57.8% church leaders, 42.2% guidance coordinator, and 36.1% lastly, from signboards/billboards.

The Chi-square (X^2) computation revealed that students' responses with respect to the sources of their information on HIV/AIDS did not relate to gender at the alpha level of .05 with respect to sources such as TV, Newspaper, Books, Church leaders, parents, brothers and sisters, guidance coordinators, friends and signboards/billboards. However, on the issue of getting information from radio and teachers, there were differences in the responses from the male and female students as shown in Table 3. For radio the chi-square computation at .05 significance level was X^2 (1, N = 83) = 4.495, p = .034, while for teachers the computation was X^2 (1, N = 83) = 6.689, p = .010. Thus, the null hypothesis was rejected in both cases.

Discussion

From the data it became obvious that teachers of the visually impaired in residential and integrated schools for the visual impaired overly relied on traditional sources and methods of teaching HIV/AIDS lessons to the students. With respect to reference sources, Table 1 revealed that the teachers largely used prescribed syllabus, newspaper information, Basic School HIV/AIDS syllabus and Workplace HIV/AIDS policy. The drop in the number of teachers who used sources such as video and film shows, poster and banners, as well as pamphlets could be attributed to the dishomogeneous nature of visually impaired students (California Department of Social Services, 2009); perhaps, only few of them could benefit from the other sources.

In terms of teaching methodology, the students' responses were revealing. Indeed, no method emerged as the most widely used among teachers of the students in the study. According to Table 2, less than 40% of students stated that their teachers used the lecture, storytelling or discussion in teaching them about HIV/AIDS. Besides, only 30% of the students reported that their teachers used field visits to educate them about HIV/AIDS; while a little above a quarter of them reportedly stated that their teachers adopted the inquiry/discovery or role play. Thus, the study revealed that a high proportion of teachers limited themselves to the use of traditional methods. Students with visual impairment in the selected schools were not exposed to common interactive methodologies such as dramatization and small group work in their HIV/AIDS classes. Again, it could be speculated that majority of the teachers found traditional methods as more suitable for their students. It would be interesting to do a follow-up study on this issue.

Finally, in terms of available sources of information on HIV/AIDS for students with visual impairment in Ghana, the study reveals that such students rely mostly on individuals that they are familiar with; for example, their teachers, parents, siblings and friends as well as church leaders. Interestingly, less than 50% of the students, who participated in the study, got their information from School Guidance Coordinators, which show that this category of professionals are not actively involved in supporting students with visual impairment in the schools which participated in the study, as the case should have been. Elsewhere, school guidance coordinators collaborate with other professionals as multidisciplinary team to support students with disabilities including visual impairment to learn successfully in schools. Besides, due to paucity of appropriate sources of information on HIV/AIDS for such as Large Print, Braille, recorded material, and computer-produced synthesized speech (California Department of Social Services, 2009; UNESCO, 2009) in Ghana, the visually impaired overly rely on human sources for information HIV/AIDS, which makes their more vulnerable.

Finally, unlike advanced countries, computers and internet are still being introduced to basic schools in Ghana, majority of schools are yet be connected to electricity to enable them procure computers to enhance teaching and learning. The 'one laptop-per-child' project for basic schools in Ghana is still at the infancy stage. It will therefore take some time for the visually impaired to have equal access to information education and communication materials in general and on HIV/AIDS in particular.

Conclusion and Recommendation

The evidence is that teachers of students with visual impairment in the selected residential and integrated schools in Ghana relied more on traditional methods of teaching HIV/AIDS lessons; they also used textbooks, syllabus, tape recorders, as well as newspaper as the main sources of information on HIV/AIDS rather than modern technology and sources of information. Finally, the students did not have access to current technologies such as Screen reader programs, JAWS, and Talking books to expose them to comprehensive information on HIV/AIDS.

Consequently, the researchers recommended to the Ministry of Education and the Ghana Education Service to provide alternative sources of information on HIV/AIDS for teachers' use to teach students with visual impairment. Also, recorded information on HIV/AIDS should be provided to students with visual impairment. The students should be trained and given jaws and dolphin pens to enable them access information on the internet on their own with little or no assistance from sighted individuals. It is also recommended that Ministry of Education, The Ghana Education Service, should organize in-service training for teachers of students with visual impairment, in both special and integrated schools, in the use of different methodologies such as Peer education, plenary discussion in teaching lessons on HIV/AIDS. Finally, nation-wide programme to educate the citizenry about the epidemic should include strategies which address the needs of all individuals including those with visual impairments.

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