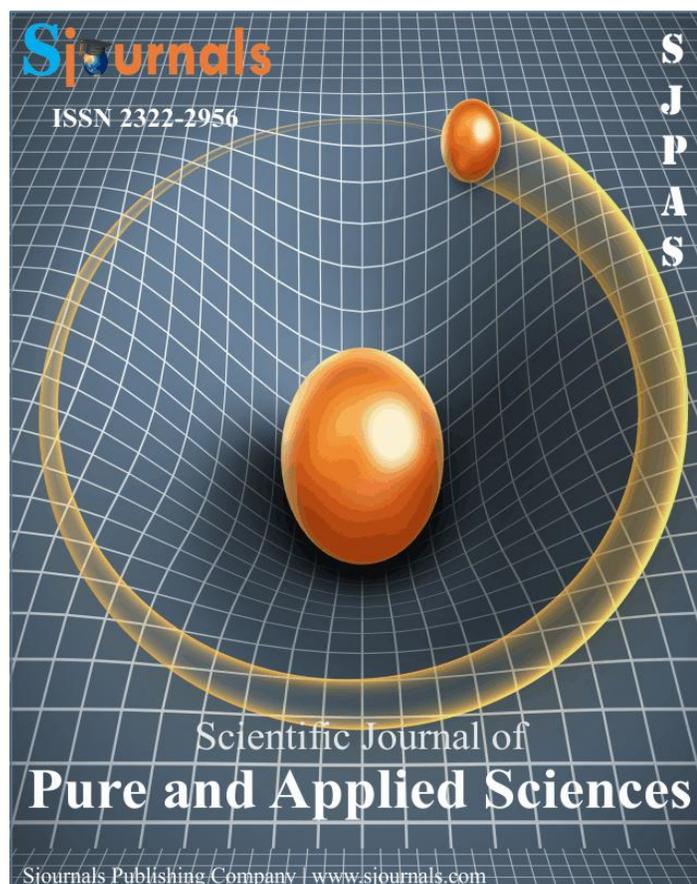


Provided for non-commercial research and education use.

Not for reproduction, distribution or commercial use.



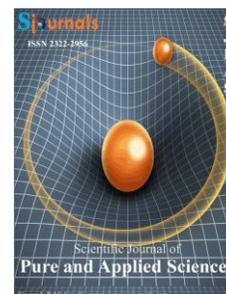
This article was published in an Sjournals journal. The attached copy is furnished to the author for non-commercial research and education use, including for instruction at the authors institution, sharing with colleagues and providing to institution administration.

Other uses, including reproduction and distribution, or selling or licensing copied, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Sjournals's archiving and manuscript policies encouraged to visit:

<http://www.sjournals.com>

© 2016 Sjournals Publishing Company



Contents lists available at Sjournals

Scientific Journal of Pure and Applied Sciences

Journal homepage: www.Sjournals.com

Review article

Perceptions of sign language among teachers in schools that enroll deaf children in Bulawayo (Zimbabwe)

Patrick Sibanda^{a,*}, Sylod Chimhenga^b

^aSenior Lecturer in the Department of Disability Studies and Special Needs Education; Zimbabwe Open University.

^bSenior Student Advisor; Zimbabwe Open University.

*Corresponding author; Senior Lecturer in the Department of Disability Studies and Special Needs Education; Zimbabwe Open University.

ARTICLE INFO

Article history,

Received 11 April 2016

Accepted 10 May 2016

Available online 15 May 2016

iThenticate screening 14 April 2016

English editing 7 May 2016

Quality control 10 May 2016

Keywords,

Perceptions

Sign language

Deaf children

ABSTRACT

The study set out to establish and analyse how teachers in schools that enroll deaf children in Bulawayo (Zimbabwe) perceived Sign language. A sample of 30 specialist and 30 mainstream teachers participated in the study which utilized descriptive and comparative survey designs. A Self-Designed Sign Language Perception Thematic Scale was used for data collection. The data were summarized into tables and analysed using descriptive and inferential statistics. The results indicated that teachers in schools that enroll deaf children in Bulawayo were aware that Sign language is the language for deaf children but perceived it as difficult to learn/teach and as a set of gestures which could only be used for expressing simple concrete ideas. The teachers were also not fully aware of the official status of Sign language. From the findings, it was also clear that the teachers did not appreciate the native and natural status of Sign language and were not sure whether it has its own proper grammatical structure which is adequate to express abstract ideas. A Chi-Square analysis confirmed these results but showed that despite findings to the contrary, specialist teachers perceived Sign language more positively than mainstream teachers. The main conclusion from these results was that deaf children in schools in Bulawayo were not exposed to the full linguistic structure of Sign language and were consequently denied development of their Deaf culture. This compromised their education. On these bases, the study recommended staff

development of teachers, establishment of Sign language resource centers, and harmonization of policies with the new Constitution and a similar but in-depth study of a national magnitude.

© 2016 Sjournals. All rights reserved.

1. Introduction

For children who are deaf Sign language is their native language or mother tongue. Ladd (2003) in Batterbury (2012:253) reports that Sign Language (Deaf) Peoples around the world have developed their own languages and visio-gestural – tactile cultures embodying their collective sense of Deafhood. Paradoxically, Sign language has not been given the full status it deserves and historically it has been undermined, degraded or excluded from the social domain in many countries. In previous centuries Deaf people were regarded as imbeciles, were institutionalised, physically abused or even made objects of experimentation (Branson and Miller, 2002). Such history has formed the basis for serious negative attitudes towards Sign language. Even Vygotsky (1983), who later became a strong proponent of the politics of the credibility of Sign language as a minority cultural discourse once considered it primitive and impoverished, and as a limited language that never aspired to abstract concepts and ideas condemning deaf people to a total lack of development. At the Milan Conference of 1880, a congress of hearing educators deliberately voted to exclude Sign language as an instructional mode in Deaf education. In Russia, Sign language was banned in schools following a conference decision in 1938 (Zaitseva et al., 1999:9). Following these events deaf teachers were terminated from employment and students who were found using Sign language outside the classroom were suspended.

Similarly, Kiyaya and Moores (2009:149) found out that teachers of the deaf in Sub-Saharan Africa in general could hardly view Sign language as a complete language. Such a scenario may not be surprising for Zimbabwe in view of the indigenous traditional culture which largely views disability negatively (Chidyausiku, 2000; Mpofu et al., 2007; Musengi and Chireshe, 2012:108). Meanwhile, Sibanda (2015) discovered that teachers of the deaf in Bulawayo were not proficient in Sign language. Honna and Kato (2003:41) concur that, for example, the negative perceptions of Sign language by hearing educators often emanates from lack of understanding of Sign language as a linguistic system different from spoken language. The explanation for this may be that many hearing people do not appreciate that Sign language is a complete language with its own unique lexicon (Stokoe, 1960), is a human rights issue and that the right to Sign language is not only as strong as the right to a minority language but is indeed even stronger because it is the right to normal social interaction and cognitive development (Trovata, 2013:402).

According to Leeson (2006:8), although of late, significant positive changes have been recorded in favour of Sign language, many oral educators continue to refute the idea that Sign language has any place at all in the education of deaf children. Consequently, such outcomes of systematically stifling the development of Sign language have persisted in many countries. In any case, a plethora of literature reports negative attitudes and perceptions towards Sign language, particular among hearing educators. The current study sought to interrogate the situation in Zimbabwe based on the argument that the perceptions of teachers about Sign language positively correlates with their acceptance of the language and their support for its use as an instructional medium and cultural tool for the deaf. Quite interestingly, little research in the field of linguistics has focused on language attitudes or language perceptions (Krausneker, 2015:411). In practice, according to Barker (1992:29) most publications on language attitudes have focused narrowly on the perception of a specific use of language especially different types of production and most studies on language attitudes have focused on variation, dialect and speech style. On these bases, the current study sought to respond to this gap by establishing the perceptions of teachers in schools that enroll deaf children of Sign language in its entirety. The term 'Deaf' with capital letter 'D' in this study is used to specifically refer to deaf people as a cultural community while 'deaf' with small letter 'd' is used in the generic sense.

2. Statement of the problem

Since the emergency of Deaf education, hearing teachers have been quoted in literature as holding negative perceptions of Sign language. The problem is that teachers with negative perceptions may not be able to promote Sign language and effectively use it in the instruction and cultural development of deaf children. This would compromise the academic performance and the socio-cultural development of deaf children in Zimbabwe and could as well be the root cause of poor academic performance of Deaf children in the country.

3. Purpose of the study

The purpose of this study was to establish how teachers in schools that enroll deaf children in Bulawayo (Zimbabwe) perceive Sign Language. The study also sought to critically analyse the implications of the teachers' perceptions of Sign language for the quality of education and the cognitive and cultural development as well as identity formation of the deaf children in those schools. Ultimately, the study aimed at proposing recommendations for improving the situation.

4. Research question

How do teachers in schools that enroll deaf children in Bulawayo perceive Sign language?

5. Sub-problems

- To what extent do the teachers in schools that enroll deaf children in Bulawayo conceive Sign language as a complete language?
- What status do the teachers ascribe to Sign language?
- How do the teachers compare Sign language to oral language?
- To what extent do the teachers accept the use of Sign language as an instructional medium for the deaf?
- Why have the perceptions on Sign language remained as they are?

6. Hypothesis

H₀: There is no significant association between how specialist and mainstream teachers perceive Sign language.

H₁: There is a significant association between how specialist and mainstream teachers perceive Sign language.

7. Theoretical framework

This study is fundamentally located within Vygotsky (1938) historico – cultural and social learning theories. Vygotsky's historico – culture theory is premised on the significance of both the physical and the socio-cultural aspects of deafness (Zaitseva et al., 1999:10). The theory also derives from the critical role played by Sign language in the development of deaf children while the social learning theory propounds the importance of adult role models particularly teachers in language acquisition and development. Within this context, Batterbury (2007:2908) agrees that Sign Language Peoples define themselves as a culturo-linguistic people with ontological frames of references to explain their existence as a global geographical community. The study can also be framed within the social model of disability which puts emphasis on the environment as a critical factor in the construction or de-construction of disability. In these regards, the perceptions of teachers on Sign language shape both the academic and socio-cultural learning environments for the deaf children.

8. Literature review

The majority of literature on the status and usage of Sign language the world over reflects on the ambivalent developments bordering on negative attitudes and exclusion interspersed with political pressure and the promising episodes forming a rich history in the evolution of deaf education. Thus perceptions on Sign languages

are grounded in the theories of attitude, the conception of deaf hood, the status, usage, benefits and the policy contexts of Sign language as defined by the international and national political spaces for the Deaf.

8.1. Ideologies and attitudes about sign language

Ideologies about Sign language determine how Sign language is perceived. Quiet relevantly, Krausneker (2015:415) argues that rarely are attitudes and perceptions on Sign language free from ideological influences. While the author admits that attitude does not have a long history in linguistics, Preston (2002:40) posits that since attitudes and perceptions are influenced by ideological constructions, it is least surprising that attitudes towards Sign language are mirrored through attitudes toward deaf people and vice-versa. This argument is corroborated through Burns, Matthews and Nolan – Conroy's (2001:182) assertion that, 'It is extremely difficult to separate the two since attitudes toward a language are often intimately connected with those toward its users.' From these arguments it is clear that the attitudes teachers in Bulawayo towards deaf children will reflect through their perceptions of Sign language. This has direct implications for the teaching, learning and general socialization of deaf children in schools.

As has already been highlighted, Sign language was historically not regarded as a complete language in its own right. It was perceived as a mere gestural system (Stokoe, 1960)). In Russia, Vygotsky's (1938) earlier negative perceptions of Sign language were later magnified through Stalin's (1950:40) notorious works entitled '*Marxism and Questions of Linguistics*' in which he asserted that deaf people were without a language and therefore abnormal and that Sign language was not even a surrogate language. Such misconceptions of Sign language were to later influence serious negative perceptions in many countries and unfortunately the remnants of these influences still persist today. After the Milan Conference (1980) and owing to the persistent negative perceptions of Sign language in Italy, deaf teachers at schools for the deaf were dismissed, Sign language was banned and those who could not progress with oral approaches were labelled 'oral failures', segregated from the 'oral successes' and frequently stigmatized (Leeson, 2006:6). At the same time, in many countries, children who used Sign language were classified as 'mentally retarded' and in many cases were punished. For Leeson and Grehan (2004), this often had religious overtones with reports of having to confess use of Sign language to be sin and having to give up signing for Lent. This is how bad and controversial the situation was internationally!

8.2. Impact of negative perceptions

The net result of these negative perceptions was complete marginalization of Sign language in many countries in favour of oral methods and later Total Communication. Research has shown that an averagely intelligent deaf child in the western world leaves school with a reading age of 8.5 years when oral methods are used (Conrad, 1979; James et al., 1990; Brelje, 1999). These developments were to later explain lowered literacy attainments among deaf children calling for drastic reviews in countries such as Scandinavia, the UK, the USA, Germany and others. These reviews have seen oral methods being replaced by the post-modern philosophy of sign bilingualism which calls for maximal inclusion of Sign language in the education of deaf children. This was after the condemnation of the once popular philosophy of Total Communication. Total Communication was severely criticized for its inefficacy in balancing the spoken and manual components often leading to production of incomplete messages in both modalities (Baker and Knight, 1998). This consequently limits educational access for deaf children.

Leeson (2006:7) laments, "...the exclusion of signed languages from deaf education in many countries seems to be one of the most restrictive moves in limiting educational access for children for who access to spoken language is very limited or completely inaccessible." Similarly, Lane (1999) earlier on declared that Sign languages are uniquely bound to Sign Language (Deaf) Peoples, that visual (sign) language cannot be substituted with oral languages and warned that previous attempts to do so have failed abysmally. This explains how badly teachers' negative perceptions of Sign language may impact on the education of the deaf children in schools in Bulawayo. For this reason, Rittenhouse (1987) cited in Faber (2015:11) is of the opinion that teachers' attitudes toward the deaf children, peers' attitudes toward deafness and the deaf child's social development have the most significant impact on perceptions of deafness and Sign language.

8.3. Hearing teachers' perception of sign language

Several studies have also proved that the perceptions of the hearing population toward deafness (and hence toward Sign language) are varied but often negative biased (Bat-Chava, 1993). A study by Kyle and Allsop (1997) showed that these negative perceptions are evident even in Deaf communities themselves. For Leigh (2009) it is of course also possible that the attitudes displayed toward deafness (hence Sign language) could impact positively on the deaf child's self-perception. Thus, the devaluing ideology places Sign language low on an imagined hierarchy and claims that Sign language has no morphology and is of no value to children (Krausneker, 2015:146) yet Sign language is the only most accessible medium of communication for the deaf. In certain instances therefore, positive perceptions of Sign language may be driven by protective or sympathetic tendencies.

Honna and Kato (2003:43) report that in Japan even specialist teachers perceived Sign language as lacking particles that characterize oral language and therefore as incomplete. The teachers thought that Sign language was deficient in its vocabulary whose items are iconistic and therefore inadequate for abstract thinking. As a result, where Sign language was referred to as an instructional aid, it was understood to be signed Japanese, a gestural system invented for teaching Japanese to the deaf, but which deaf people do not consider as Sign language. Meanwhile, in a national survey of the perceptions of deaf educators about Austrian Sign Language, 'only' 92.2% answered 'Yes' to the question on whether Sign language was a fully functional language. Krausneker (2015:417) argues that while this may appear to be a favourable percentage, it was shocking that 7.8% of the teachers answered 'No' considering that the sample was exclusively made of specialist teachers of the deaf. In Kenya, Adoyo (2002:91) observed that many teachers still doubted the status of Sign language as a real language due to the assumption that a language must be spoken. In his further analysis, Adoyo predicts that what makes such perceptions difficult to defeat is intimately related to the colonial legacy of education in Africa which classified those who could speak English as elite.

In South Africa, according to Glaser and Van Pletzen (2012:12), only 14% of the teachers of the deaf have well developed Sign language skills. As a result, deaf children are generally exposed to haphazard and simplistic signing with exaggerated oral language due to lack of understanding of the complexity and sophistication of Sign language among teachers. The situation may not be very different in Zimbabwe where Musengi and Chireshe (2012:107) report lack of Sign language access and Mutswanga and Mapuranga (2014:67) noted doubt among the hearing population as to whether Sign language is a bonafide language. Generally, teachers of the deaf in Sub-Saharan Africa have difficulty appreciating Sign language as complete (Kiyaya and Moores, 2009:149) and this scenario may not be surprising particularly for Zimbabwe in view of the indigenous traditionalist culture which largely views disability negatively (Chidyausiku, 2000; Mpofu et al., 2007; Musengi and Chireshe, 2012:108). Honna and Kato (2003) concluded that treating the use of Sign language as some kind of deviance, deficiency, or pathology, stems from ignorance of the nature and complexity of Sign language among the hearing population. For Batterbury (2012:256) these misconceptions stem from paucity of political power and little penetration by Deaf people into professions such as teaching.

8.4. The changing tide

It is however prudent to also note that the negative perceptions reported in many countries have significantly changed although voices of resistance are still evident today. This was not of course until Stokoe (1960) proved beyond reasonable doubt that Sign language is a complete and true language with its own adequate morphological and lexical components. This was also not until the Deaf caused a political stir to protect their cultural legacy. Zaitseva et al. (1999:9), for instance, comments that, while in Russia the echoes of Stalin's '*Marxism and Questions of Linguistics*' are still apparent in deaf education, generally attitudes have changed substantially and society has tended to be viewed as a conglomeration of different cultures. In the USA, Sign language has become increasingly popular even among the hearing and more schools are accepting and implementing it to their foreign and minority language programmes (Faber, 2015:12). Several countries have also enshrined Sign language as an official language.

These positive moves have been largely a result of a collective effort among the Deaf the world over in fighting for their rights via the political spaces created by Deaf movements. These Deaf movements' efforts have also been corroborated through increased research and information on Sign language linguistics. In this context, Krausneker (2015:421) suggests that the new paradigm in ideological foundation for language attitude should be

that which principally values diversity and appreciates that human normalcy is but an illusion. In so doing, Sign language will be appreciated as a different but legitimate language. This is however not to suggest that the war of resistance against Sign language can be won overnight. As Krausneker (2015:417) puts it, 'Even in the presence of information, to the contrary, uncertainty and doubt remain about Sign language and their status, quality and value. Thus existential doubt about Sign language will continue to shape such perceptions even at policy level despite the legal status Sign language has been accorded in many countries today.

8.5. Status of sign language

The many negative perceptions of and attitudes towards Sign language have been perpetuated by lack of legal recognition of the language. Leeson (2006:10) implores that the other reason is that in many countries, Sign language had not become an obligatory part of the teacher training curricula. The first country in the world to give Sign language an official or legal status was Sweden in 1981. Thereafter, many other countries legally recognized Sign language and enshrined it in their statutes. This was largely the result of political pressure from Deaf moments. Examples of such countries are as follows: Czech Republic (1988), Finland (1995), Austria (2005), Portugal (1997), Slovak Republic (1995), Belgium (2006), Wallonia, UK and Northern Ireland (2003), Denmark (1991), Norway (1997/8), Germany (2002), Greece (2000), Iceland (1999), Latvia (2000), Slovenia (2002) and Zimbabwe (2013). In South Africa, unlike in Zimbabwe, Sign language is not constitutionally recognized as one of the official languages in that country but is officially recognized as an instructional medium (Van Pletzen, 2012:26). While it is encouraging to have countries giving Sign language legal status, Leeson (2006:7) rightfully argues, "It must be recognized that the legal recognition of Sign languages in and of itself is not enough to protect Sign language users, or to ensure an appropriate educational experience..."

In reviewing the status of Sign language, questions have been proffered as to whether deaf people are a linguistic minority or citizens with a disability. Such questions brought to the fore discourses on whether Sign language should be viewed from a minority language paradigm or disability paradigm. Krausneker (2015:919) observe that the minority language paradigm may open up new possibilities for Sign language although focus may be restricted to linguistic rights at the expense of necessary technical provisions. Meanwhile, the disability paradigm may lead to more negative consequences such as creation of a benefit trap which leads to a dependency syndrome. Therefore, Batterbury (2012:253) advocates for a shift in policy discourse away from a disability construction to one recognizing the minority language status of Sign language. This is because many Sign Language People see themselves as a linguistic community rather than a disability formation and aspire to the attainment of minority language rights (Jokinen, 2005; Ladd, 2003; Lane, 2008; Edwards, 2010). The advantage of minority language legislation is that it removes labeling and offers parity of rights. However, Batterbury (2012:257) notes that disability legislation which is practiced in UK, Zimbabwe, SA and many other countries has greater potency since it requires service providers to take reasonable steps to avoid placing Deaf people at a disadvantage by availing techno-medical provisions.

8.6. Sign language, Deaf Culture, Deafhood and Deaf Gain

Sign language is the central theme that defines the collective nature of Deaf people. It is thus pivotal in the conceptualization of Deaf community, Deaf culture, Deafhood and Deaf Gain. For Bahan (1989); Lane et al (1996), Padden and Humphries (1988), a close analysis of Deaf communities highlights to their collective linguistic and cultural patrimony. Central to this patrimony is indeed Sign language which becomes the defining attribute of Deaf culture. Ladd (2003) defines Deaf culture as a way of giving utterance to the belief that Deaf communities contain their own ways of life mediated through their Sign language, that is, the shared experience of Deafhood. The concept of Deaf culture is also pillared through Deaf enterprise, collective consciousness and community actualization. In this context, writes Wrigley (1996:115) by "...recasting the meaning of Deafness in positive terms, by reclaiming the authority of directly lived experiences, Deaf people the world over are making clear political claims to self- and collective determination." This collective determination is expressed through Deafhood consciousness and by using Sign language as an interactive and liberating tool.

Deafhood is a concept that was coined by Paddy Ladd (2003) to describe a process in which Deaf individuals come to find their own Deaf identity (Faber, 2015:12). Faber explains that Deaf people construct their identity around their variable priorities and principles related to their language, nationality, culture, era they were raised in

and their socio-economic class. In this context Deafhood becomes a consciousness concept that involves process and reconstruction of Deaf traditions related to becoming and maintaining Deaf (Leigh, 2009:19). The term encompasses the collective beliefs, values, a sense of normality, pride and confidence Deaf people today aspire for and continuously articulate via Sign language discourses and political expressions. However, Krausneker (2015:416) postulates that even today many people are not sure whether the communities and cultures that gave rise to Sign languages can really be regarded as cultures.

Within the same discourse on Sign language a new concept of Deaf Gain has been emerged to enable scholars in Deafhood to summarize the appreciative attitudes toward Deaf people who use Sign language (Bauman and Murray, 2014). According to Baum and Murray (2009), Deaf Gain is by definition, a reframing of 'deaf' as a form of sensory and cognitive diversity that has the potential to contribute to the greater good of humanity. The gains are framed within cognitive, creative and cultural diversity which is pinned on Sign language as a new language in a family and as a new experience. Baum and Murray (2014) elucidate that Deaf Gain is conceptualized along the same semantic concepts of 'benefit', 'contribute' and 'ahead'. This ideological shift expresses language in a positive manner and as a tool for progressive development. In other words, Sign language is portrayed positively and anything to the contrary negates the recognition of human diversity. So, 'maintaining devaluating, audistic or stereotyping ideologies with regards to Sign language will in the end be more of an effort than seeing, understanding and appreciating Deaf Gain' (Krausneker, 2015:422). Thus for teachers in Zimbabwe for instance, to effectively teach deaf children and win their attention, they must bear a positive perception of Sign language.

8.7. Justification for sign language

The justification for Sign language is premised on its naturalism to the Deaf and its centrality of value in Deaf culture, Deafhood and Deaf Gain. The most basic justifications for Sign language are that it is just like any other language and that it is a true and most natural language for the deaf which has its own unique lexical and morphological properties (Stokoe, 1960). According to World Federation of the Deaf (2009), all Sign languages all over the world just like oral languages have their own heritages, histories, cultures and traditions. Even Vygotsky (1938:323), who earlier had strong reservations about Sign language, later admitted that, it has a critical role to play in the education of deaf children. Vygotsky postulated that for deaf people, spoken language plays almost no part in their development and that it is not a tool they can use to accumulate cultural experience or to participate in social life. Batterbury (2012:255) concurs that the oral nature of spoken language renders it inaccessible to the deaf and that the oral option of language for the deaf is technically absent.

Use of oral language as an instructional medium, in effect, deprives the child the linguistic access and leads to negative literacy and cognitive outcomes while socially it would deny the child the benefits of membership of the Deaf culture. By implication, Sign language acts as a vehicle for self-identity formation, bridge to literacy development and achievement of academic excellence for deaf children. For example, deaf individuals often utilize their knowledge of Sign language structure as a guide to text (Evans, 1998). Flanders (2005:4) writes "Without Sign language, Deaf people cannot function and participate fully in society, because it is through Sign language that Deaf people communicate with the outside world. Take Sign language away from a Deaf person and s/he is disabled because s/he does not have a language to communicate. Without Sign language, Deaf people cannot survive in society, cannot get an education, cannot communicate..." In these regards, Honna and Kato (2003:41) conclude that Sign language is an indispensable mode of communication for the deaf since it is the most useful symbolic means to overcome hearing disability.

8.8. Sign language as a human rights and policy issue

In as much as all peoples of the world have rights to their languages, deaf people also have a right to Sign language making Sign language a rights issue. Carelessly drafted policies can perpetuate negative perceptions of Sign language or technically exclude it. The Conference on Sign language held in Norway in 2011 concluded that, national Sign languages are the mother tongues of deaf people and the only language they can acquire effortlessly and therefore a fundamental right for deaf children (WFD, 2011:1). Batterbury (2012:255) designates the issue of language right for deaf people as language justice which he argues emphasizes Sign Language People's need to achieve social justice through language access rather than through other forms of social redistribution. In the context of minority language rights theory, May (2003) earlier recognized the importance of language and identity

and its link to social exclusion while Skutnabb-Kangas (2010:213) described language human rights as necessary to satisfy people's basic needs. Thus, any negative perceptions of Sign language among teachers portray a denial of the rights of deaf children. Batterbury's (2015) preference of emphasizing Sign language in terms of social justice rather than in terms of human or language rights owes to scholars of social justice's idea of placing the onus on government to redress inequalities through redistribution of benefits and burdens. For Sign language, this entails coming up with language policies that would expand social inclusion through language access, sign bilingual education and promotion of the linguistic patrimony of the Deaf.

Consequent to the foregoing, the UN Convention on the Rights of Persons with Disabilities (2007) espouses the social model of disability, but despite its disability orientation, provides for the recognition of Sign language and promulgation of Sign language policy and ultimately language justice for the deaf (Batterbury, 2012:257). Also rooted in the human rights model, the Convention on the Rights of Persons with Disabilities contains five articles referring to national Sign language requiring their recognition and other linguistic human rights for the deaf. These include Article 2 in which Sign language is part of the definition of language, Article 9 on linguistic access, Article 21 on freedom of expression and Article 24 on education and sport. Article 21b obliges signatories, of which Zimbabwe is one, to formally recognize Sign languages. Notwithstanding its disability framing, Batterbury believes that the convention offers the best hope for Sign language policy that recognizes the linguistic rights of the deaf and offers them inalienable language justice.

In addition to the international Convention on the Rights of Persons with Disabilities (2007) the UN has a series of other legal initiatives aimed at protecting minority languages but not necessarily Sign language per-se. One such instrument which mentions linguistic human rights is the UN International Covenant on Civil and Political Rights (1966) which in Article 27 grants linguistic minorities the right to use their own languages. This implies that deaf children have a right to the use of Sign language as their native language both in school and community. The other international policy framework is the UN Convention on the Rights of the Child (1989) which stipulates that children of linguistic minorities and indigenous children have the right to use their languages in their communities. In both frameworks, Sign language is implied as one of the minority languages. The UN Salamanca Statement and Framework for Action on Special Needs Education (1994) also spells out in Article 21 that deaf children should be enabled access to education through their national Sign languages. In response to these international conventions, covenants and frameworks, the Constitution of Zimbabwe Amendment No. 20 (2013) in section 6 recognises Sign language as one of the 16 official languages. Of concern to the deaf in Zimbabwe is that the enforcement processes are weak and that the Disabled Persons Act (1992) had not, by the time of conducting the research, been harmonized with this constitutional provision.

9. Methods

This study was predominantly informed by positivism since it was framed within the quantitative paradigm. The study utilised descriptive and comparative survey designs. A Self-Designed Sign Language Perception Thematic Scale was used as the major data collection instrument from 30 specialist and 30 mainstream teachers. The scale comprised of both affirmative and neutral dimensions as a way of authenticating the results of the study. Specialist teachers were sampled using purposive while mainstream teachers were sampled using simple random sampling. It emerged that 6 of the specialist teachers were engaged in mainstream classes in which they had no direct contact with deaf children. Data were summarised and presented on simple frequency and contingency tables and analysed using both descriptive and inferential statistics.

10. Results

A summary of results reflecting on the perceptions of teachers in Bulawayo about Sign language were cross-tabulated with qualification in terms of whether one was a specialist or mainstream teacher. A comparative analysis was provided in relation to both affirmative and neutral dimensions of the Self- Designed Sign language Perception Thematic Scale. A Chi-square analysis was then used to confirm the results.

Table 1

Analysis of affirmative dimensions.

Perception	Specialist teachers						Mainstream teachers						Overall					
	0		1		2		0		1		2		0		1		2	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
SL is easy to learn/ teach	11	36.7	10	33.3	9	30	4	13.3	14	46.7	12	40	15	25	24	40	21	35
SL is a complete language in its own right	0	0	1	3.3	29	96.7	0	0	8	26.7	22	73.3	0	0	9	15	51	85
SL is one of the official languages	4	13.3	4	13.3	22	73.3	6	20	6	20	18	60	10	16.7	10	16.7	40	66.7
SL has its own formal grammar	2	6.7	10	33.3	18	60	0	0	12	40	18	60	2	3.3	22	36.7	36	60
SL is the native language (L ₁) for the deaf	2	6.7	3	10	25	83.3	2	6.7	16	53.3	12	40	4	6.7	19	31.7	37	61.7
SL is central to Deaf culture	2	6.7	8	26.7	20	66.7	4	13.3	10	33.3	16	53.3	6	10	18	30	35	60
SL has equal status to oral language	3	10	9	30	18	60	6	20	16	53.3	8	26.7	9	15	25	41.7	26	43.3
SL should be taught in schools	1	3.3	4	13.3	25	83.3	0	0	6	20	24	80	1	1.7	10	16.7	49	81.7
SL can be used to make complete and abstract expressions	6	20	7	23.3	17	56.7	0	0	10	33.3	20	66.7	6	10	17	28.3	37	61.7
SL is the natural language for the deaf	0	0	5	16.7	25	83.3	2	6.7	8	26.7	20	66.7	2	3.3	13	21.7	45	75

Key: 0 = No 1 = Not Sure 2 = Yes SL = Sign Language.

From the results only 30% of the specialist teachers and 40% of the main stream teacher's perceived Sign language as easy to learn/teach meaning 70% and 60% respectively felt that it was difficult. On the whole 35% of the teachers in Bulawayo felt that Sign language was easy and 65% felt otherwise. A large percentage (96.7%) of the specialist teachers knew that Sign language is a complete language and 85% of the mainstream teachers concurred. These findings compared favourably with Faber's (2015) assertion that in the USA, Sign language has become increasingly popular even among the hearing. Twenty six point seven percent (26.7%) of the specialist as compared to 40% of the mainstream teachers was interestingly unaware that Sign Language is one of the official languages in Zimbabwe giving an overall of 33.7% of the teachers in Bulawayo who were ignorant of this important fact. Of the specialist teachers 60% felt that Sign Language has a proper grammar and a similar percentage of the mainstream teachers felt the same, showing that a significant 40% doubted the existence of a Sign Language grammar.

The results also indicate that 83.3% of the specialist teachers perceived Sign Language as the native language or mother tongue for deaf children as opposed to 40% of the mainstream teachers who felt as such. However, 66.7% of the specialist teachers were the only ones who believed that Sign Language was central to Deaf culture and 53.3% of the mainstream teachers thought so although many of them later commented that they were not sure on that aspect. Similarly, 60% of the specialist and only 26.7% of the mainstream teachers respectively appreciated that Sign Language has an equal status to oral language. The overall picture shows that 43.3% of the teachers were the only ones who perceived Sign Language as having an equal status to oral language. Meanwhile, 83.3% and 80% of the specialist and mainstream teachers respectively thought that Sign Language was to be

taught as a subject in all schools. It was interesting to note that a higher percentage (66.7%) of the mainstream teachers than that of specialist teachers (56.7%) regarded Sign Language as having the ability to express complete and abstract ideas. On whether Sign language is the natural language for deaf children, 83.3% of the specialist teachers and 66.7% of the mainstream teachers respectively responded to the affirmative with a significant number (21.7%) of all the teachers indicating that they were not sure. Some of these high percentages of ignorance or doubt especially among specialist teachers are worrisome. Similarly, in a national survey of the perceptions of deaf educators about Austrian Sign Language, 'only' 92.2% answered 'Yes' to the question on whether Sign language was a fully functional language. Krausneker (2015:417) then argued that while this may appear to be a favourable percentage, it was shocking that 7.8% of the teachers answered 'No' considering that the sample was exclusively made of specialist teachers of the deaf

Table 2
Analysis of neutral dimensions.

Perception	Specialist						Mainstream						Overall					
	0		1		2		0		1		2		0		1		2	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
SL is difficult to learn/ teach	12	40	6	20	12	40	4	13.3	16	53.3	10	33.3	16	26.7	22	36.7	32	53.3
SL is meaningful when used with oral language.	12	40	9	30	9	30	4	13.3	18	60	8	26.7	16	26.7	27	45	17	28.3
SL has no proper grammar	10	33.3	16	53.3	4	13.3	0	0	12	40	18	60	10	16.7	28	46.7	22	36.7
SL is only used to express simple concrete ideas	19	63.3	8	26.7	3	10	18	60	6	20	6	20	37	61.7	14	23.3	9	15
SL is a set of gestures	13	43.3	3	10	14	46.7	4	13.3	4	13.3	22	73.3	17	28.3	7	11.7	36	60
SL isolates the deaf from society	18	60	4	13.3	8	26.7	20	67.7	6	20	4	13.3	38	63.3	10	16.7	12	20
SL reflects that one has a hearing disability	13	43.3	2	6.7	15	50	12	40	6	20	12	40	25	41.7	8	13.3	27	45
Deaf children should learn to speak.	17	56.7	3	10	10	33.3	20	67.7	6	20	4	13.3	37	61.7	9	15	14	23.3
Total communication should be used in place of SL	13	43.3	10	33.3	7	23.3	20	67.7	8	26.7	2	6.7	33	55	18	30	9	15
Oral language is the better communicative option for the deaf	18	60	6	20	6	20	18	60	8	26.7	4	13.3	36	60	14	23.3	10	16.7

Key: 0 = No 1 = Not Sure 2 = Yes SL = Sign Language

From the table, 40% and 33.33% of the specialist and mainstream teachers respectively felt that Sign Language is difficult to learn or teach with the same percentage (40%) of the specialist teachers and 13.3% of the mainstream teachers thinking that it is not difficult. A significant number of specialist teachers (20%) and the majority of mainstream teachers (53.3%) were not sure whether Sign language was difficult to learn or to teach. On the whole, 53.3% of all the teachers insinuated that Sign language is difficult. Thirty percent of specialist teachers thought that Sign language is only meaningful when used with oral language and 26.7% of the mainstream teachers felt the same with the majority not sure about this assertion. Similar conditions were noted in South Africa where as a result, deaf children are generally exposed to haphazard and simplistic signing with exaggerated oral language due to lack of understanding of the complexity and sophistication of Sign language among teachers (Glaser and Van Pletzen, 2012:26).

On whether Sign language has a proper grammar 53.3% of the specialist teachers were not sure and 60% of the mainstream teachers turned around and indicated that Sign Language has no proper grammar. Of the specialist teachers, 10% were of the feeling that Sign Language is only for expressing simple concrete ideas while 20% of the mainstream teachers expressed the same. Overall, 23.3% of all the teachers were not sure. A large number (46,7%) of the specialist teachers surprisingly perceived Sign language as a set of gestures and similarly 73.3% of the mainstream teachers concurred giving an overall 60% of the teachers in Bulawayo thinking that Sign language is a mere set of gestures. These results are corroborated by other results of a previous study by, Honna and Kato (2003) who noted that teachers in Japan thought that Sign language was deficient in its vocabulary whose items are iconistic and therefore inadequate for abstract thinking.

Other surprising but interesting results were that 23.3% of the specialist teachers thought that Sign language isolates deaf people from society and at the same time 50% perceived Sign language as being reflective of a hearing disability. Meanwhile, only 14.3% of the mainstream teachers thought that Sign language does isolate the deaf from society and 40% conceived it as reflective of a disability. On the whole 45% of the teachers in Bulawayo believed that use of Sign Language reflects a hearing disability. It also surprising that 33.3% of the specialist teachers indicated that deaf children should learn to speak as compared to only 13.3% of the mainstream teachers who expressed the same. A further surprising result is that 23.3% of the specialist teachers preferred Total Communication to Sign language as a medium of instruction while 38.3% of them were not sure about which of the two media should be used. Of the mainstream teachers, 67.7% said 'No' to the use of Total Communication 26.7% were not sure and only 6.7% preferred its use to Sign language. This is despite that in other countries total communication has been discourage. Total Communication was severely criticized for its inefficacy in balancing the spoken and manual components often leading to production of incomplete messages in both modalities (Barker and Knight, 1998). A similar trend emerged when teachers were asked to indicate whether oral language is a better communicative option for the deaf to which 20% of the specialist teachers responded to the affirmative and less (13.3%) of the mainstream teachers concurred. On the use of oral language, Vygotsky (1938) postulated that for deaf people, spoken language plays almost no part in their development and that it is not a tool they can use to accumulate cultural experience or to participate in social life. Batterbury (2012:255) concurs that the oral nature of spoken language renders it inaccessible to the deaf and that the oral option of language for the deaf is technically absent. It was however not clear whether the mainstream teachers' perceptions were genuine or emotionally driven by a sympathetic attitude toward the deaf children considering that the believed that Sign language is a reflection of a hearing disability.

Table 3
Contingency table for affirmative dimensions.

Qualification	Responses			Total
	No	Not sure	Yes	
Specialist Teacher	31(27.5)	61(83.5)	208(189)	300
Mainstream Teachers	24(27.5)	106(83.5)	170(189)	300
Total	55	167	378	600

The contingency table shows both observed and expected responses to all the affirmative dimensions. Thus, of the 600 total responses to the Sign Language Perception Scale specialist teachers, said 'No' to the affirmative dimension 31(5.2%) times while in 61(10.2%) cases they were not sure while in 208 (34.7%) of the responses they

confirmed the affirmative dimensions. For mainstream teachers, 24 (4%) of the 600 responses were ‘No’ responses while in 106 (17.7%) of the cases the mainstream teachers were not sure while in 170 (28.3%) of the cases they affirmed the dimensions. The resultant Chi-Square test analysis ($\alpha = 0.05$, $X^2_{crit}=6$, $X^2_{stat} = 16.8$) confirmed that, despite the other results from tables 1 and 2, the overall picture shows that specialist teachers perceived Sign Language significantly more positively than mainstream teachers with mainstream teachers generally not sure about the positive dimensions about Sign Language.

Table 4
Contingency table for neutral dimensions.

Qualification	Responses			Total
	No	Not Sure	Yes	
Specialist Teachers	145(132)	67(78.5)	88(89)	300
Mainstream Teachers	120(132.5)	90(78.5)	90(89)	300
Total	265	157	178	600

Table 4 is the contingency table indicating observed and expected frequencies of responses to neutral dimensions on the Sign Language Perception Scale. The table indicates that in 145 (24.2%) of all the 600 responses, specialist teachers indicated ‘No’ responses to the negative views about Sign language, while mainstream teachers indicated the same in 120 (20%) of the cases.

In 67 (11.2%) of the 600 responses, specialist teachers were not sure while in 90 (15%) of the cases it was the mainstream teachers who were not sure about the neutral dimensions about Sign language. In 88 (14.7%) out of 600 cases special teachers viewed Sign language negatively while for mainstream teachers the number stood at 90 (15%) out of 600 responses. Another Chi-square analysis ($\alpha = 0.05$, $X^2_{crit} = 6$, $X^2_{stat} = 5.75$) this time of neutral dimensions showed no significant association between specialist and mainstream teachers negatively perceived Sign language.

Although some positive perceptions were also noted, in the mains, Honna and Kato (2003) concluded that treating the use of Sign language as some kind of deviance, deficiency, or pathology, stems from ignorance of the nature and complexity of Sign language among the hearing population. For Batterbury (2012:256) these misconceptions stem from paucity of political power and little penetration by Deaf people into professions such as teaching.

11. Conclusion

On the bases of the findings of this study, the following conclusions were drawn:

- While many of the teachers appreciated that Sign language is the language for deaf children, they generally doubted its native or mother tongue status and its fullness and complexity as a language. As a result deaf children were not exposed to a full Sign language structure.
- Teachers in schools that enroll deaf children in Bulawayo were not fully aware of the official status of Sign language and were skeptical if it has an equal status to oral languages. They perceived it as a simplistic system of gestures without a formal grammatical system and which can only be used to express simple concrete ideas. Thus, the teachers ascribed a low status to Sign language.
- The teachers strongly felt that Sign language should be taught in schools but were not aware of its instructional efficacy as compared to Total Communication for example. They projected an ambidextrous perception of Sign language. On the surface, they projected a sympathetic view of the language when in practice they perceived it as difficult to learn/teach. Therefore teachers did not fully use Sign language with deaf children.
- Teachers in schools that enroll deaf children in Bulawayo viewed Sign language from a disability perspective. They hardly understood its cultural and appreciative aspects. As such deaf children were not supported in their quest for the development of their own culture (deaf culture).
- The reason for the status quo is that teachers in schools that enroll deaf children in Bulawayo lacked understanding of the appreciative or positive aspects of Sign language and at the same time even specialist

teachers of the deaf children lacked proficiency in the language (Sibanda, 2015). The negative perceptions could have been due to lack of Sign language knowledge and skills than ideological negative attitudes.

- Despite the general negative perceptions of Sign language among all the teachers, there was a significant association between qualification and the affirmative dimensions of the language. Specialist teachers had more positive perceptions of Sign language than mainstream teachers.

Recommendation:

As a way of improving the situation for the betterment of the education of deaf children in Zimbabwe, the study proposed the following recommendations:

- That staff development workshops be held at cluster levels on both the appreciative and proficiency aspects of Sign language starting with the specialist teachers of the deaf who would then act as resource persons for other teachers.
- Deliberate intensive awareness drives on legal and policy pronouncements should be spearheaded by the Department of Schools Psychological Services and Special Needs Education in the Ministry of Primary and Secondary Education. These initiatives should also play a pivotal role in the harmonisation of the Disabled Persons Act (1992) and the provisions on Sign language in the Constitution of Zimbabwe Amendment N^o 20 (2013).
- Ministry of Primary and Secondary Education to explore credentialing of teachers of the deaf in consultation with special schools for the deaf which should act as resource centers.
- Ministry of Primary and Secondary Education to consider establishment of District Disability Resource Centers (DDRCs) which could run Basic and Intermediate Sign Language courses for teachers (even at a nominal fee). These courses should embrace the concepts of Deaf culture, Deafhood and Deaf Gain in addition to Sign language proficiency skills.
- There is need to carry out a similar but in-depth study of a national magnitude.

References

- Adoyo, P.O., 2002. Emergent approaches towards sign bilingualism in deaf education in Kenya. *Stichproben.*, 83-96.
- Bahan, B., 1989. Notes from a seeing person. In Wilcox, S. (Ed). *American Deaf Culture: An Anthology*. Maryland: Linstok Press.
- Baker, R., Knight, P., 1998. Total communication: Current policy and practice. In Gregory, S., Knight, P., McCracken, W., Powers, S., Watson, L. (Eds). *Issues in Deaf Education*. London: David Fulton. 77-88.
- Barker, C., 1992. Attitudes and Languages. Clevedon: Multilingual Matters.
- Bat-Chava, Y., 1993. Antecedents of self-esteem in deaf people: A Meta-analytic view. *Rehab. Psychol.*, 38(4), 221-234.
- Batterbury, S.C.E., 2012. Language justice for sign language peoples: The UN convention on the rights of persons with disabilities. *Language Policy*, 11, 253-272.
- Baum, H.D.L., Murray, J.J., 2009. Reframing: From hearing loss to deaf gain: *Deaf Studies Digital Journal*. <http://www.dsdj.gallaudet.edu>.
- Bauman, H.D.L., Murray, J.J., 2014. *Deaf Gain: Raising the Stakes of Human Diversity*. Minneapolis: University of Minnesota Press.
- Branson, J., Miller, D., 2002. *Damned for their difference: the cultural construction of deaf people as disabled*. Washington D.C: Gallaudet University Press.
- Brelje, H.W., 1999. *Global perspectives on the education of the deaf in selected countries*. Butte Publications.
- Burns, S., Matthews, P., Nolan-Conroy, E., 2001. Language Attitudes. In Lucas, C.(Ed.) *Sociolinguistics in the Deaf Community*. Cambridge: Cambridge University Press, 181-215.
- Conrad, R., 1979. *The deaf school child: language and cognitive function*. London: Harper & Row.
- Edwards, R.A.R., 2010. Hearing aids are not deaf: A historical perspective on technology in the deaf world. In Davis, L.J., the *Disability Studies Reader* (3rd Ed). London: Routledge, 403-416.
- Evans, C.J., 1998. Literacy acquisition in deaf children. Paper presented at the annual meeting of the teachers of english to speakers of other languages. Seattle: WA.

- Farber, G.B.S., 2015. Social perception toward deafness: How could it influence deaf identity development and the deaf community. *Gallaudet Chronicles of Psychology*, 3(1), 10-13.
- Garret, P., 2010. *Attitudes to Language*. Cambridge: Cambridge University Press.
- Glaser, M., Van Pletzen, E., 2012. Inclusive education for deaf students: Literacy practices and South African sign language. *Southern African Linguistics and Applied Language Studies*, 30(1), 25-37.
- Government of Zimbabwe, 1992. *Disabled Persons Act*. Harare : Government Printers.
- Government of Zimbabwe, 2013. *Constitution of Zimbabwe Amendment No 20: ACT*. Harare: Government Printers.
- James, T., O'Neill, E., Smyth, J., 1990. *Reading Assessment of Deaf Children*. Dublin: National Rehabilitation Board.
- Jokinen, M., 2005. Linguistic rights: sign language as a right in UN convention on the rights of persons with disabilities and in the legislation of member countries. Paper presented at the CRPD negotiations, WFD. <http://www.un.org>. Accessed 20/05/16.
- Kiyaya, N.B., Moores, D.F., 2009. Deafness in Sub-Saharan Africa. In Moores, D.F., Miller, M.S. (Eds). *Deaf people around the world*. Washington D.C: Gallaudet University Press.
- Krausneker, V., 2015. Ideologies and attitudes toward sign languages: An approximation. *Sign Language Studies*, 15(4), 411-431.
- Kyle, J., Allsop, L., 1997. *Sign on Europe: A Study of deaf people and sign and sign language in the European union. A study in 17 countries on the request of the European union of the deaf*. Bristol: Center for Deaf Studies, University of Bristol.
- Ladd, P., 2003. *Understanding Deaf Culture: In Search of Deafhood*. England: Multilingual Matters.
- Lane, H., 1992. *The mask of benevolence: Disabling the deaf community*. New York: Alfred A. Knopf.
- Lane, H., 2008. Do deaf people have a disability? In Bauman, H.D.L (Ed). *Open Your Eyes: Deaf studies talking*. Minnesota: University of Minnesota Press. 277-292.
- Lane, H., Hoffmeister, R., Bahan, B., 1996. *A journey into the deaf world*. San Diego: Dawn Sign Press.
- Leeson, I., 2006. *Signed languages in education in Europe: A preliminary exploration*. Strasbourg: Language Policy Division.
- Leigh, I., 2009. *A Lens on Deaf Identities: Perspectives on Deafness*. New York: Oxford.
- May, S., 2003. Misconceiving minority language rights: Implications for liberal political theory. In Kymlicka, W. & Patten, A. (Eds) *Language Rights and Political Theory*. Oxford: OUP.
- Musengi, M., Chireshe, R., 2012. Inclusion of deaf students in mainstream rural primary schools in Zimbabwe: Challenges and Opportunities. *Stud Tribes Tribals*, 10(2), 107-116.
- Mutswanga, P., Mapuranga, B., 2014. Perceptions of 'Hearing' people on sign language learning in Zimbabwe. *Int. J. Human. Soc. Sci. Educ.*, 1(4), 59-68.
- Nations, 1966. *International Covenant on Civil and Political Rights*. New York: UN United.
- Nonna, N., Kato, M., 2003. Establishing sign Language in Deaf education in Japan: A Sociolinguistic Approach. *Intercultural Communication Studies*, 12(3), 37-50.
- Padden, C., Humphries, T., 1988. *Deaf in America: Voices from a culture*. London: Havard University Press.
- Preston, D.R., 2002. Language with an Attitude. In Chambers, J.K., Trudgill & Schlling-Estes, N. (Eds). *The handbook of language variation and change*. Malden: Blackwell, 40-66.
- Rittenhouse, R.K., 1987. The attitudes of teachers toward mainstreaming of hearing impaired high scholars. *J. Rehab. Deaf.*, 20(3), 11-14.
- Skutnuabb-Kangas, T., 2003. Linguistic genocide and the deaf. Paper presented at the world congress of the world federation of the deaf, July, (<http://www.deafzone.ch>). Accessed on 30/04/16.
- Stokoe, W., 1960. *Sign Language Structure*. New York: University of Buffalo Press.
- Trovato, S., 2013. A stronger reason for the right to sign languages. *Sign Language Studies*, 13(3), 401-422.
- United Nations, 1989. *Convention on the rights of the child*. New York: UN.
- United Nations, 1994. *The salamanca statement and framework for action on special needs education: World Conference on Special Needs Education; Access an Quality*. Salamanca: UNESCO
- United Nations, 2007. *Convention on the rights of people with disabilities*. New York: UN.
- Vygotsky, L.S., 1983. The fundamentals of defectology. In Rieber, R.W., Carton, A.S. (Eds), (1993) *The Collected Works of L.S Vygotsky, Volume 2* (Translated by Knox, J.E. & Stevens, C.B.). London: Plenum.
- Wrigley, O., 1996. *The politics of deafness*. Washington DC: Gallaudet University Press.
- Zaitseva, G., Pursglove, M., Gregory, S., 1999. Vygotsky, sign language and the education of deaf pupils. *J. Deaf. Stud. Deaf. Educ.*, 4(1), 9-15.

How to cite this article: Sibanda, P., Chimhenga, S., 2016. Perceptions of sign language among teachers in schools that enroll deaf children in Bulawayo (Zimbabwe). Scientific Journal of Pure and Applied Sciences, 5(5), 440-454.

Submit your next manuscript to Sjournals Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in DOAJ, and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.sjournals.com

