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IS IT POSSIBLE TO WRITE A SCIENTIFIC PAPER IN AN AFRICAN LANGUAGE ?
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# IS IT POSSIBLE TO WRITE A SCIENTIFIC PAPER IN AN AFRICAN LANGUAGE ?

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## ABSTRACT

***Objective*: To explore the ability of ChiShona to express the formal categories of reporting scientific information. This would guide and enable authors to write abstracts of their work for formal presentations or as appendices to publication.**
***Design*: Document analysis of selected Medical Journals in English**
***Setting*: Medical Library, College of Health Sciences. University of Zimbabwe.**
***Results*: The vocabulary and terminology to structure a scientific report is available or can be constructed from available vocabulary.**
***Conclusion*: The writing or translating of an original research paper is technically demanding. Other forms of communicating scientific information are more flexible and may be used more readily to develop scientific text in ChiShona, at least in the beginning. This will probably be the case with other African languages.**

## INTRODUCTION

The status of African languages in most African countries militates against their development as intellectual languages. They are generally not used as mediums of instruction or taught in the science streams at secondary and tertiary level. There are no academic publications or fora in the sciences where scientific ideas can be discussed and disseminated in an African language, with the exception of Afrikaans and to a lesser extent Swahili. Some websites have language options for their content. The World Federation of Societies of Anaesthesia (WFSA) has fifty-nine language options of which there are two African languages (Afrikaans and Kiswahili), seventeen Asian and thirty-seven European languages. Languages cannot develop but through use.

The aim of the study was to explore the ability of ChiShona, spoken in Zimbabwe, to express the formal categories of reporting scientific information.

## LITERATURE REVIEW

Throughout history some languages have experienced dominance over other languages through a variety of ways. Having a larger population of speakers and wider territorial range is one obvious method that can be applied to the relationship between different African languages in the present era. Political and military conquest is the way many European languages (English, French, Portuguese, and Spanish) and Arabic became dominant on the African continent. Economic power has elevated English, as the language of the USA, to a global language and is raising the global profile of Chinese. Dominant African languages may enjoy the status of national languages rather than official languages, which has tended to be reserved for colonial languages. The distinction is important because with an "official" language it is required that government and other public information and documentation is available in that language. This becomes another driver in language development. Languages that lose the power struggle have and may, at worst face extinction. This happened with Egyptian in the past, and many San and Khoe languages in our own time and region.

In the history of Western civilisation language development has played a very crucial part. Dating back to ancient Greece, the "source" of Western civilisation, language not only defined who was Greek (as there were no national states) but contained all that was known about Greek learning. Following the conquest of "Greece" by the Romans, Greek remained the language of learning and culture, even in Rome,

while Latin was the language of government and administration (1). Latin borrowed heavily from Greek in vocabulary and literature, and through translation, conquest and use itself developed to be the language of Western Europe (2). Galen, who lived in Rome in the second century AD wrote his medical treatises in Greek while practicing medicine in Latin.

After the collapse of the western Roman empire (509BC – 476AD), Greek persisted and flourished in the eastern Roman empire (330AD- 1435AD) centred on Constantinople. The rise of the Muslim states after 600 AD made Arabic a significant language of learning and culture. The rulers wanted to have access to all the learning then known to them and set about translation of all the Greek, Latin, Persian, Sanskrit, and others texts, which in the process developed Arabic significantly as an intellectual language (4,5). The 'Translation Movement' lasted from about 800AD to 1150AD. The renaissance in Europe later developed as a re-discovery of Greek and Latin learning contained in Arabic and other texts recovered from the collapse of the eastern Roman Empire, and re-translating back began(6). Greek, Latin and Arabic then became the source languages for the developing European national languages. Literature in the national languages developed first (Dante in Italian early 1300s, Chaucer in English late 1300s, Villon in French in mid 1400s etc while its use in learning and intellectual discourse came later (Galileo in Italian early 1600s, Descartes in French mid-1600s, Newton in English early 1700s). This enabled the developing natural sciences and medicine to gradually shift from Latin as languages of teaching and academic discourse to national languages (Paris, Bologna, Oxford). Scholarly Journals also started to appear and in national languages (Le Journal des Scavans in French and Philosophical Transactions of the Royal Society in English both in 1665 and Ephemeriden in 1670 in German, Journal of the German Academy of Sciences Leopoldina).

Although there are many reasons for the development of national languages in Europe away from Latin, the development of literature and scholarship in the languages was linked to a desire to make information and knowledge available to as many people as possible (7,8). Although Latin was spoken across the whole of Europe it was the language of the few, educated and wealthy. To be literate meant to be literate in Latin, much like today it means to be literate in English (in most Anglophone countries). In addition, later the religious Reformation broke the control of the Catholic Church over learning, allowing people to read the Bible (and other materials) for themselves in their own language. Alongside these developments, other sources of knowledge became available, for example through the guilds, where Latin and Greek were not a prerequisite. This knowledge was passed on through local or national languages (9).

African languages are in a similar position to where European languages were 4-600 years ago, but with more inclement weather. Latin was in decline then whereas English goes from strength to strength as a global language (10). Nevertheless, efforts do have to be made to develop African languages as intellectual mediums of communication (11,12).

## MATERIALS AND METHOD

A number of key local, regional and major general international medical journals were identified. The different categorical headings were identified and definitions or explanations sought from the 'author guidelines' or 'instructions for authors' sections as well as from 'Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals' (www.icmje.org/icmje-recommendations.pdf). Medical scientific journals publish a number of categories of text for scientific communication such as: abstracts, research papers, review articles, editorials, clinical reports, letters and others (Table 1). Where no English definitions or explanations could be established from the ICMJE, Oxford English Dictionary was used.ChiShona definitions or explanations or equivalents were derived from dictionaries or expert opinion. Dictionaries used were DuramazwiGuru ReChiShona, Standard Shona Dictionary, Duramazwi, Duramazwire Dudziramutauro ne Uvaranomwe (13-16).

Table 1: List of journals and journal sutes reviewed. CAJM: Central African Journal of Medicine [Zimbabwe], SAMJ: South African Medical Journal [South Africa], EAJM: East African Journal of Medicine [Kenya],BMJ: British Medical Journal [UK], The Lancet [UK] NEJM: New England Journal of Medicine [USA], JAMA: Journal of the American Medical association [USA]. World Health Organisation Bulletin [WHO].

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| | | | | | Categories | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Journal | Abstracts | Original (Research) Papers | Review | Editorial | Letter/ Correspo-ndence | News | Other | | |
| Local | CAJM | | Research papers | | | | no | | |
| Regional SAMJ | Structured abstracts | Research articles (inc Scientific letters) | Reviews | Editorials | Letters to the editor | Inzindaba | Forum book reviews | Orbituaries | |
| | EAJM | | Original papers | | | | no | Case reports | |
| | | | | Analysis articles | | | | Practice: Change, guidelines easily missed, Rational imaging and testing, Uncertainities, 10 minute consultation, Pt journey, Quality improvement reports, Lesson of the week, evidence based report | Orbit-uaries |
| | BMJ | | Research article | Clinical review | Editorials | Letters (Rapid response) | News | Case reports | |
| | | | | Research methods and reporting | | | | Personal views, Medical classics, Minerva | |
| | Lancet | | Articles (Original research – red section) | (Green section) Reviews, seminars, Series | Editorial (Blue section) | Correspo-ndence | News | Comments Viewpoints Hypotheses Perspectives Case reports Adverse Drug reports World reports Other departments Department of error | Orbi-tuaries |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| International | | | | | | | Clinical cases Brief reports Clinical problem solving Case records of Masecchusettes gen hospital | |
| | NEJM | Structured abstract | Original research Original articles Special articles | Reviews | Editorial | Letters to the editor | | Perspective, Sounding Board Clinical implications of basic research Special reports Health law ethics and human rights, Health policy reports, Occasional notes, Images in clinical medicine |
| | JAMA | | Original contributions Clinical trials Systematic reviews Care of the critically ill Brief report Research letter | Clinical review | | | | Viewpoint, A piece of mind, Clinical challenge, clinical cross roads, Grand rounds, JAMA clinical evidence synopsis Special communication Rational clinical examination Poetry and medicine Book and media reviews |
| WHO | Bulletin | | Research abstracts published in Arabic, Chinese, French, Russian and Spanish at the end of paper | Systematic review | Editorial | | | Policy and practice Learning from the field Perspectives Round tables Commentary |

**Table 2**

*Headings for structured abstract. English headings with ChiShona equivalents followed by English back translation and ChiShona explanation of the term. Alternative ChiShona terms are given in square brackets.*

| English | ChiShona | English / ChiShona definition / explanation [alternative terms: ] |
|---|---|---|
| Abstract | Pfupiso | Summary, shortening:<br>kurevamumazwimashoma<br>[pfupikiso, chidimbu, pashoma] |
| Title | Musoro | Head (ing) / musorowegwaro kana nyaya<br>[zitaeg 'rebhuku' ie book title. So 'zitarebepa'] |
| Corresponding author | Munyorianonyorerwa | The author to write to/The one to correspond with<br>Munyorianezengeachinyorerwanemupepeti kana vaverengi |
| Background/ Context | Mamiriro | The situation leading to the study<br>Ari mamiriroezvinhukutitsvakurudzoizova [sakiso] |
| Objective/Aim | Vaviro | Purpose, reason for Chinangwa |
| Design | Rongwa | Plan, Design marongerwo [Rongero ] |
| Setting | Nzvimboyetsvakurudzo | Place of research nzvimboyekuitiratsvakurudzo |
| Subjects [study population] | Vafundwi [human]<br>Zvifundwi [objects] | Those to be studied<br>Vanhu kana zvinhuzvinengevirikuongororwanetsvakurudzo (vana)<br>Nyakufundwa |
| Main outcome measure | mupimowenangwa | Measurement of the objective<br>Mapimirwoechinangwa |
| Results | Umboo | Outcome, result, product<br>Zviwanikwazvetsvakurudzo [Zvaonwa, Zvaonekwa, Wano] |
| Conclusion | Mheto | Wrap up<br>Pfungwadzekupedzisira [magumo, gumo] |

**Table 3**

*Headings for text [body] of Research Paper. English terms given and ChiShona equivalents*

| English | ChiShona | back definition / explanation of the ChiShona [alternative terms: ] |
|---|---|---|
| Title | Musoro | Head(ing) |
| Introduction [context and background] | Nhange, Nhuriro | At the beginning. Kutururanyaya. Kutangagwaro. Mavambirwoenyaya [runhange, manhange, manhanganyaya, nhuriro, nhururanyaya, mavambo] |
| Literature Review | Mhenenguroye Uvaranomwe | Critical review of the literature.<br>Kupenengurazvinyorwamaererano ne nyayaiyi.<br>[TsoropodzoyeUvaranomwe] |
| Method | Maitirwo | How it was done / How it is to be done.<br>[Nzirayakatevedzerwamukuitatsvakurudzo] |
| Analysis | Ongororo, | Examination, Exploration. Pick-through [mhenenguro, Nan'anidzo] |
| Ethics<br>• Conflict of interest | Ruramo<br>• Mhesanoneruramo | Uprightness, rectitude, Maitiroakayanuka, [nduramo, yanuko]<br>• Conflict with ethics |

| | | |
|---|---|---|
| Results | Umboo, | Evidence , Outcome, findings.<br>[Zvaonwa, Zvaonekwa ,Wano] |
| Illustrations | Onwa | Image(s). Visuals. –ratidzo<br>[Chi~(s), Zvi~(pl) illustration /demonstration |
| Discussion | Hurukuro | Discussion, [nhaurirano, Nhaurwa] |
| Conclusion | Mheto | Wrap up.<br>Gumisidzo, [mhedziso] |
| Acknowledgements | Nhendo | Thankful, appreciation. Kutenda. Kuvonga. Rutendo, Vonganidzo |
| References | Jerero | Sources, bibliography.<br>Machereredzo |
| Funding | Tsigiro | Support, patronage, 'aid'.<br>Batsiro. Rubatsiro. |

**Table 4**

*English names and definitions / explanations of types of journal articles in medical journals. ChiShona equivalent names with explanations and their back translations.*

| Types of journal paper | ChiShona equivalents | Comment |
|---|---|---|
| Editorial: authoritative opinion | Bepetwa: [zvasarudzwa] what has been selected | |
| Commentary: explanatory analysis | Tsanangudzo: [jekesera] [elaboration, explanation] | The structure is very varied, and subheadings depending on nature of the material presented. Abstracts may or may not be required. If used often unstructured. |
| Review: exhaustive critical assessment | Donogoro[kutsetsenuranyaya] [detailed/comprehensive discussion] | |
| Perspective/ viewpoint: opinion | Zvirimupfungwa [kutaura] [opinion, talking, thoughts] | |
| Forum/Round Table: Debate | Mhikisano [debate]<br>Mhenenguro [critique]<br>Makakatano [arguement] | Depending on the material may be structured the same as research paper. |
| Letters/ Correspondance : | Tsamba [letter],<br>Mwadhi [letter] | Communication addressed to journal editor for publication with information, questions or comments |
| Research Letter | Tsambayerutsvakurudzo | Letter presenting new scientific information usually because the information for communication is not sufficient for a full paper. |
| Seminars, Series, Essay | Gwaronyorwa [essay]<br>Bangamazano [exploring different issues, counselling] | |
| Clinical Report : | RondedzeroyeUrwere<br>[narrative report of Illness] | |
| Guidelines: [rubric] | (mi)Rairo [instruction(s)] | |
| News: reportage | Nhau [news, current affairs] | |

**Figure 5**
*Other related relevant terminology*

| | | | | | | |
|---|---|---|---|---|---|---|
| Glossary dudziramazwi | Revision dzokororo | Correction gadziridzo | Appendix mvekerwa | Retraction dzotswa | Leading author munyorimukuru | Database dhatabesi dura- |
| Keywords mazwiekunanga | Volume bumbwa | Issue dhindwa | Number rengani | Manuscript chinyorwa | Contents Zvirimukati | Index indekisi |

## RESULTS

*The Abstract*
Abstracts may be published alone as a record of conference proceedings or at the beginning of certain types of publications such as Research (Original) articles, systematic reviews and others. It is a summary of the paper whose purpose is to highlight the most important points of the paper. Publications usually require structured abstracts for research papers and unstructured abstracts for opinion pieces. The general format of a structured abstract is presented below, in English and Shona terminology equivalents.

*Original (Research) Paper/Article*
The Research (tsvakurudzo) Paper (gwaro) is the key paper in scientific reporting. It is a structured paper designed to demonstrate the experimental method and reports results of experiments. The general headings are presented below with their Shona equivalents. Depending on the type of research paper and publication there are variations in the headings and sub-headings.

*Others types of papers*
After research papers, reviews, editorials and various kinds of opinion papers represent a lower level of evidence. However, they are flexible in structure and represent a powerful way of disseminating current information, good practice, standard knowledge and as a teaching material resource. Before scientific journals, letters were the principal sources of written scientific communication. Nowadays they are principally used to discuss recently published papers and as 'short papers'. Many journals have moved this section to be on-line (rapid response). Case Reports have declined dramatically. Case studies are used as education (CME) and learning points. Rare cases or clinical challenges are occasionally accepted in leading journals. Publication of practice guidelines has become standardised and being widely published in medical journals.

Most major international journals carry a news section. The South African Medical Journal does, but Central African Medical Journal and East African Medical Journal do not. Journals that are published regularly and frequently will be current with the news. This is often by in-house journalists and reporters and follows 'house style'. (Table 5)

## DISCUSSION

Original research papers tend to be compact and so lack the flexibility of elaborating on ideas not present in the language.The writing or translating of a research paper is therefore technically demanding. Other forms of communicating scientific information are more forgiving and are less rigid in structure. The vocabulary to structure a scientific report in ChiShona has been be demonstrated above. Some of this terminology has already been developed by linguists in Zimbabwe. Experience with other African languages has set the ground rules for developing terminology in an African context (17).

Writing scientific material in African languages shifts the responsibility for language development towards subject experts, and becomes a shared responsibility with language experts. The generation of material in local languages makes it possible also to teach the concepts in the vernacular at lower levels of the education pyramid, such as secondary school (18). This should also create a demand for greater language skills at tertiary level among subject experts, further developing the language.

The case for developing African languages may not be convincing to people in the science field. Who will read the abstracts in Shona since the people in the science community are more proficient in English than their 'mother tongue'? The education argument is that the level of competency in English of the majority of students studying science at tertiary level is poor, and the majority struggle to understand the scientific principles (19). Their learning experience could be made richer and easier if there was material available in their 'mother tongue' which they would use to learn the fundamentals then use that comprehension in English. Development of materials involves transfer of concepts from the source language, and re-formulation of the explanatory statements and models to fit with the target language sentence structure and world view.

The major international medical journals use a wide variety of types of article to disseminate information, including those contributed by patients. They also use press briefing notes to make their scientific content of papers accessible to non-scientific public.

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**REFERENCES**

1. Treadgold W. A History of the Byzantine State and Society. *Stanford University Press. Stanford.* 1997
2. Rochette B.Language policies in the Roman Republic and Empire [translated by Clarkson J] in A companion to the Latin language. *Blackwell. London.* 2011
3. Lindberg DC. The Beginnings of Western Science. *University of Chicago Press. Chicago* 1992
4. Gutas D.Greek thought, Arab culture: the Greaco-Arab Translation movement in Bagdad and early Abbasid Society. *Routledge* 1998
5. Savage-Smith E, Pormann PE. Medieval Islamic Medicine. *Edinburgh University Press. Edinburgh.* 2007
6. Saliba G.Islamic science and the making of the European Renaissance. Cambridge MA & London. *MIT Press*. 2007.
7. Crossgrove W. Vernaculisation of science, medicine and technology in later medieval Europe: broadening the perspective. *Early Science and Medicine* 2000;**5**:47-63
8. Taavitsainen I, Pahta P.Vernaculisation of medical writing in English: a corpus-based study of scholasticism. *Early Science and Medicine* 1998;**3**:157-185
9. Mooji A. Doctors of Amsterdam: Patients Care, Medical Training and Research: 1650-2000. *Amsterdam University Press. Amsterdam*. 2010
10. Falagas ME, Fabritsi E, Chelvatzoglou FC, Rollos K.Penetration of English language in science. *Critical Care* 2005, **9**:655-656
11. Kwamangamalu NM. Vernacularisation, globalization and language economics in non-English-speaking countries in Africa. *Language Problems and Language Planning* 2010;**34**:1-23
12. Kwamangamalu NM. English in language policies and ideologies in Africa: challenges and prospects for vernacularisation. Language Problems and Language Planning. doi: 10.1093/oxfordhb/9780199744084.013.0027 in Oxford Handbook of Sociolinguistics.Ed. Bayley R, Cameron R, Lucas C. 2013
13. Chimhundu H, Mangoya E.Duramazwi Guru ReChiShona, African Languages Research Institute, *University of Zimbabwe and College Press*, Harare. 2001. Zimbabwe
14. Hannan, M. Standard Shona Dictionary. *College Press and Literature Bureau*. 1987 Harare. Zimbabwe
15. Dale D. Duramazwi. *Mambo Press Gweru* 2005 Zimbabwe
16. Chimhundu H. DuramazwireDudziramutauro ne Uvaranomwe. *Mambo Press Gweru,* 2007 Zimbabwe
17. Batibo HM. Motivation, principles and strategies in terminology development: the Tanzanian experience. In Terminology Development for the Intellectualisation of African Languages: Uphuhliso-sigamangenjongoyokuphuhlisaiilwimizesiNtungokugqibeleleyo. Proceedings, in English and isiXhosa or isiZulu, from the SANTED Terminology Development Workshop held on 11–12 May 2009. EdMaseko P. PRAESA Occasional Papers No. 38 Grahamtown& Cape Town. 2010 South Africa.
18. Viriri E, Rubaya C.The language question in the teaching and examination of 'A' Level Shona: a case of Masvingo District in Zimbabwe. *Theory and Practice in Language Studies*. 2013;**3**:903-909
19. Ipara I, Mbori B. The Role of Kiswahili in Enhancing the Potential of Science and Technology. *The Journal of Pan African Studies*. 20