The Relevance of Phonology to Communication Studies

Sunday Okakwu Ape

Department of English/French, Nigeria Police Academy, Wudil, Kano.

ABSTRACT

The notion people have of the relationship between phonology and some other fields of study is that they are totally different and independent of one another. Some think that communication studies are independent of phonological studies. In fact, they may even have the notion that phonology should be restricted to the study of English and other languages. This article argues that phonology is a vital academic exercise/study for anybody in the business of communication; after all communication is done using language, and language includes phonetics and phonology. The article delves into academic library research to explicate the concepts of communication and phonology. It describes the English sound pattern with exemplifications and explores the possible problems of the second-language user of English, particularly the problem of MT-interference. In its conclusion, the article is a suggestion to communication experts and other users of English in communication to strive to attain a good accent of the language so that they can communication to include phonetics and phonology in the curriculum of communication studies; then the required accuracy can be achieved by our communication experts.

INTRODUCTION

Communication studies are aimed at making one able enough to communicate messages to others. The facilities with which this is done include speaking with accurate articulation. This means that communication and phonology are inseparable because the latter has to do with the sounds of a language, how they are articulated and the rules guiding their articulation to ensure an accurate expression. Accuracy in articulation is synonymous with accuracy in expression. Accurate communication involves accurate articulation of sounds in message delivery.

The ground-level of the argument therefore is that communication involves speaking to present a message in a language. Speaking involves phonation, a process which, according to Omachonu (11), relates to the situation of the vocal cords in speech production. The phonemes of the language should be properly articulated from the speech organs in order for the audience to derive meaning(s) from the speaker. This speech or sound articulation is the involvement of phonology. Since communication involves speaking and phonology is about speaking with accurate articulation, phonology is relevant to communication studies.

DEFINITIONS OF TERMS

By dictionary definition, communication refers to the activity or process of expressing ideas and feelings or of giving people information. It can also mean the methods of sending information, especially telephones, radio, computers to an audience. The crux of communication is message. In communication, messages are sent.

Akmajian et ally (361 - 415) identify different kinds and shades of communication including literal communication, non-literal communication, sign language, symbolism and others. Standing out in their explication is the concept of the message model of linguistic communication, which has fascinated this article. In application to linguistic communication, the message model of communication involves the speaker and the hearer or the transmitter and the receiver or the encoder and the decoder. The channel is the vocal auditory path which involves the sound wave, that is, the sound of the language of communication. The idea of the "sound of the language" is central to phonology as it is to communication studies.

A speaker conceives a message, produces some expression (sound) in a language that encodes the message to a hearer, who identifies the sound of the language to decode the message. The end-result is a successful model of communication, that is, a successful message model of communication (see the diagram of speech act/communication). Katz (103 - 104) puts the idea more succinctly;

"The speaker ... chooses some message he wants to convey to his listeners: Some thought he wants them to receive or some command he wants to give them or some question he wants to ask. This message is encoded in the form of a phonetic representation of an utterance by means of the system of linguistic rules with which the speaker is equipped. This encoding then becomes a signal to the speaker's articulatory organs, and he vocalizes an utterance of a proper phonetic shape. This, in turn, is picked up by the hearer's auditory organs. The speech sounds that stimulate these organs are then converted into a neural signal from which a phonetic representation equivalent to the one into which the speaker encoded his message is obtained. This representation is decoded into a representation of the same message the speaker originally chose to convey by the hearer's equivalent system of linguistic rules. Hence because the hearer employs the same system of rules to decode that the speaker employs to encode, an instance of successful linguistic communication occurs".

From Katz's explication, the idea of the "sound of the language" is central to human linguistic communication. By the term "sound of the language", phonetics and phonology are implicated in communication. They are quite relevant to communication studies. What are phonetics and phonology?

"Phonetics and phonology" can be spoken of as a unit or an entity, one meaning the other and the other meaning one. In that sense, it is seen as a term. But phonetics can be a concept and phonology another. According to Omachonu (2 - 8), phonetics is the scientific study of sounds, giving the description or analysis of what one hears. Like him, Wells and Colson (1975) define phonetics as the study and description of pronunciation. Phonetics deals with the principles and processes of pronunciation.

Roach (2000) makes the definition clearer by causing a difference between "phonetics" and "phonology". According to him, phonetics is the study of how sounds are produced and the description of the sounds themselves. Phonology on the other hand deals with how the sounds are pronounced and the rules guiding their relationships in connected speeches (cf. O'Connor: 1980).

Whatever the distinction may be, phonetics and phonology are all about the sounds of a language. It is the sounds of a language that are used in communication, particularly the human linguistic communication. Phonology is relevant in communication studies because if the sounds of a language are not adequately learnt and/or articulated, communication will not be adequate or effective or may fail. In Nigerian universities and other higher institutions, English language is the main medium of communication. The same English is the medium of communication in most media houses in Nigeria. The sounds of English are therefore crucial to all communications done in English and communication studies that use the language as a tool.

DESCRIPTION OF THE SOUNDS OF ENGLISH

Roach (2000) presents the chart of the International Phonetic Alphabet (IPA) as revised in 1993 and up-dated in 1996, containing twenty (20) vowel sounds and twenty-four (24) consonant sounds. A vowel sound, from the point of view of O'Connor (1980), is made without any clear obstruction to the pulmonic egressive air (air from the lungs). The twenty vowel sounds in English are categorised into

- a) twelve (12) pure vowel sounds and
- b) eight (8) diphthongs.

The twelve pure vowel sounds are further categorised into

- a) long pure vowel sounds and
- b) short pure vowel sounds.

The long pure vowel sounds are articulated with long beats, and as such are written with a colon in front of them. Each sound of English is abstractly represented with a phonetic symbol. The phonetic symbols for the five long vowel sounds are

[i:] as in beat /bi:t/, seed /si:d/, lead /li:d/, leak /li:k/, greed /gri:d/

[a:] as in ask /a:sk/, art /a:t/, part /pa:t/, pass /pa:s/, mass /ma:s/, mast /ma:st/, car /ka:/

- [:] as in port /p:t/, court /k:t/, ball /b:l/, call /k:l/, core /k:/, sore /s://
- [u:] as in coo/ku:/, who/hu:/, you /ju:/, stew /stju:/, rude /ru:d/, rule /ru:l/, fool /fu:l/

[3:] as in bird /b3:d/, girl /g3:l/, pearl /p3:l/, word /w3:d/, work /w3:k/, nurse /n3:s/

The short vowel sounds are articulated with short beat. They are thus phonetically represented:

[i] as in bit /bit/, lid /lid/, lick /lik/, grid /grid/

[e] as in end /end/, bed /bed/, dead /ded/, bread /bred/.

[æ] as in act /ækt/, bad /bæd/, sack /sæk/, pack /pæk/

[5] as in odd /5d/, hot /hot/, lock /lok/, socks /soks/

[u] as in put /put/, cook /kuk/, full /ful/, foot /fut/, look /luk/

 $[\Lambda]$ as in cut /k Λ t/, under / Λ nd ∂ /, love /l Λ v/, flood /fl Λ d/, blood /bl Λ d/, suck /s Λ k/

[∂] as in again / ∂ gein/, around / ∂ raund/, broth<u>er</u>/br $\Lambda \delta \partial$ /, sist<u>er</u>/sist ∂ /, doct<u>or</u>/dokt ∂ /

The diphthongs are also vowel sounds. According to O'Connor (1980), a diphthong involves the gliding of the tongue from the position of one pure vowel sound to the position of another pure vowel sound. For instance, if the tongue glides from the position of $[\mathfrak{A}]$ to that of [i], the sound will be [ai]. The eight diphthongs in English are categorised into three:

- a) those which end with [i], as in [ai, ei, ɔi]
- b) those which end with [u], as in [au, ∂u]
- c) those which end with $[\partial]$, as in $[i\partial, e\partial, u\partial]$

They are thus presented inn their word examples:

[ai] as in I /ai/, ice /ais/, eyes /aiz/, buy /bai/, fight /fait/, lie /lai/, cry/krai/

[ei] as in eight /eit/, aid /eid/, paste /peist/, lake /leik/, day /dei/, tailor /teil∂/

[ji] as in oil /jil/, ointment /jintmnt/, boy /bji/, buoy /bji/, employ /implji/

[au] as in out /aut/, house /haus/, how /hau/, town /taun/, mouth /mauθ/

 $[\partial u]$ as in <u>oat</u> / ∂ut /, <u>oath</u> / $\partial u\theta$ /, <u>ode</u> / ∂ud /, <u>soak</u> / $s\partial uk$ /, <u>toe</u> / $t\partial u$ /, th<u>ough</u> / $\delta \partial u$ /

 $[i\partial]$ as in <u>ears</u> /i ∂z /, fear /fi ∂ /, here /hi ∂ /, seer /si ∂ /, tears (noun) /ti ∂z /, cheer /t $[i\partial/$

 $[e\partial]$ as in <u>air</u> /e ∂ /, <u>care</u> /ke ∂ /, <u>fair</u> /fe ∂ /, <u>fare</u> /fe ∂ /, <u>tear</u> (verb) /te ∂ /, <u>tare</u> /te ∂ /

 $[u\partial]$ as in s<u>ure</u> / $\int u\partial/$, c<u>ure</u> / $kju\partial/$, p<u>ure</u> / $pju\partial/$, t<u>our</u> / $tu\partial/$, spirit $\underline{u}al$ /spirit $\int u\partial l/$

The twenty-four (24) consonant sounds in English can also be described according to their manners and places of articulation. As O'Connor (1991) puts it, a consonant sound is made with clear obstruction to the pulmonic egressive air (air from the lungs). By place of articulation, the reference is to the part of the mouth in which an obstruction is formed against the air and at which a sound is made. Gimson (1980) identifies the following places of articulation in the mouth

- a) the bi-labial, involving the two lips,
- b) the labio-dental, involving the lower lip and the upper teeth-set,
- c) the inter-dental, in between the two sets of the teeth,
- d) the alveolar, the point where the tip of the tongue touches the hard palate roof of the mouth,
- e) the palato-alveolar, the point at which the tongue touches the soft palate,
- f) the velar, the point at which the back of the tongue touches the velum,
- g) the glottal, the point of obstruction at the glottis.

The consonant sounds are categorised into

- a) six plosive consonant sounds [p, b; t, d; k, g]
- b) nine fricative consonant sounds [f, v; s, z; \int , 3; θ , δ ; h]
- c) two affricate consonant sounds $[t_j, d_3]$
- d) three nasal consonant sounds $[m, n, \eta]$
- e) four approximant/lateral consonant sounds [l, r, w, j]

A plosive consonant sound is made with plosion. It explodes out of the total blockage (obstruction) built against the air by some of the organs of speech. The six plosive consonant sounds are thus presented and exemplified:

[p] is a voiceless bi-labial plosive consonant sound, heard in

pain /pein/,

<u>p</u>e<u>pp</u>er /pep∂/,

wra<u>pp</u>er /ræp∂/,

cla<u>p</u> /klæp/

[b] is a voiced bi-labial plosive consonant sound, heard in

<u>b</u>aby /beibi/,

ru<u>bb</u>le /r∆bl/,

cra<u>b</u> /kræb/,

rabies /reibiz/

[t] is a voiceless alveolar plosive consonant sound, heard in

tame /teim/,

<u>tatt</u>oo /tætu:/,

<u>Th</u>omas /tɔm∂s/,

late /leit/,

la<u>tt</u>er /læt∂/

[d] is a voiced alveolar plosive consonant sound, heard in

<u>daddy</u> /dædi/,

card /ka:d/,

redundant /tidAnd∂nt/,

paddle /pædl/

[k] is a voiceless velar plosive consonant sound, heard in

 \underline{c} ome /k Λ m/,

<u>c</u>ra<u>ck</u> /kræk/,

<u>k</u>ettle /ketl/,

sa<u>ck</u> /sæk/

[g] is a voiced velar plosive consonant sound, heard in

gaggle /gægl/,

ra<u>g</u> /ræg/,

<u>gh</u>ost /g∂ust/,

la<u>g /</u>læg/,

lager /læg∂/

A fricative consonant sound is made with friction. The nine fricative consonant sounds in English are hereby presented phonetically with some word-examples:

[f] is a voiceless labio-dental fricative consonant sound, heard in

fame /feim/,

leaflet /li:flet/,

life /laif/,

<u>ph</u>antom /fænt∂m/,

lau<u>gh</u> /la:f/

[v] is a voiced labio-dental fricative consonant sound, heard in

vest /vest/,

ri<u>v</u>er /riv∂/,

Stephen /stiv∂n/,

grie<u>ve</u> /gri:v/

[s] is a voiceless alveolar fricative consonant sound, heard in

sick /sik/,

<u>c</u>ell /sel/,

ri<u>ce</u> /rais/,

ki<u>ss</u> /kis/,

www.iiste.org

wrist /rist/

[z] is a voiced alveolar fricative consonant sound heard in

<u>z</u>ebra /zibr∂/,

zeal /zi:l/,

reason /ri:zn/,

ri<u>se</u> /raiz/,

ra<u>z</u>or /reiz∂/,

breeze /bri:z/

 $[\int]$ is a voiceless palato-alveolar fricative consonant sound heard in

<u>sh</u>ip /∫ip/,

<u>ch</u>ampaigne /∫æmpein/,

mission /mi∫∂n/,

condition /k ∂ ndi $\int \partial$ n/,

fi<u>sh</u>er /fi∫∂/

[3] is a voiced palato-alveolar fricative consonant sound, heard in

<u>g</u>enre /ʒa:nr∂/,

measure /mei3∂/,

leisure /li:3∂/,

beige /beiz/

 $[\theta]$ is a voiceless inter-dental fricative consonant sound, heard in

thing /θiŋ/,

nothing /noθiŋ/,

ba<u>th</u> /ba:θ/,

breath /breθ/

[ố] is a voiced inter-dental fricative consonant sound, heard in

then /ốen/,

that /ốæt/,

northern /nɔ:ố∂n/,

ba<u>the</u> /beiố/,

breathe /bri:ố/

[h] is a voiceless glottal fricative consonant sound, heard in

house /haus/,

hell /hel/,

rehearse /rih3:z/,

bee-hive /bi:haiv/

The affricate consonant sounds are a combination of the plosive and the fricative. The sound begins with plosion and ends up in friction. They are:

[t] is a voiceless alveolar affricate consonant sound heard in

 $\underline{ch}ur\underline{ch}/tJ3:tJ/,$

<u>ch</u>ange /t∫einʤ/,

ritual /rit∫u∂l/,

ac<u>t</u>ual /ækt∫u∂l/,

Chelsea /tʃelsi:/

[dʒ] is a voiced alveolar affricate consonant sound heard in

James /dzeimz/,

judges /&Adziz/,

<u>George</u> /dz:dz/,

knowledge /nolidz/,

privilege /privilidz/

The nasal consonant sounds are made with the air exiting through the nasal cavity instead of the mouth cavity. The three nasal consonant sounds in English are voiced and thus presented with word-examples:

[m] is a voiced bi-labial nasal consonant sound heard in

<u>mamm</u>al /mæm∂l/,

name /neim/

[n] is a voiced alveolar nasal consonant sound heard in

<u>nanny</u> /næni/,

cain /kein/,

cane /kein/

[ŋ] is a voiced velar nasal consonant sound heard in

si<u>ng</u> /siŋ/,

si<u>ng</u>ing /siŋiŋ/,

ba<u>n</u>k /bæŋk/.

According to Roach (61), "a lateral consonant is one in which the passage of the air through the mouth does not go in the usual way; instead, there is complete closure between the centre of the tongue and the part of the roof of the mouth where a contact is to be made". An example is the lateral /l/ in which the centre of the tongue makes contact with the hard palate (alveolar ridge). The consonant /l/ and the other approximants are voiced. It is heard in words such as

late /leit/

release /reli:z/

kett<u>le</u> /ketl/

<u>l</u>oca<u>l</u>/l∂uk∂l/.

It is to be noted that the /l/ in "local" is different from the /l/ in "kettle" in the sense that one is non-syllabic while the other is syllabic. A syllabic consonant sound is the one that forms a syllable on its own, as in

kett-le /ket-l/

bott-le /bot-l/

catt-<u>le</u>/kæt-l/

bubb-<u>le</u> /bAb-l/

brist-le /bris-l/.

The syllabic /l/ may be followed by a consonant but not by a vowel sound, as in

bott-les /bot-lz/

bubb-les /bAb-lz/

drizz-les /driz-lz/.

The non-syllabic /l/ forms a syllable with other sounds- vowels and consonants, as in

<u>l</u>o-ca<u>l</u>/l∂u-k∂l/

pas-to-ral/pæs-t∂-r∂l/

cu<u>l</u>-tu-ra<u>l</u>/kΛl-t∫∂-r∂l/

<u>l</u>a-te-ral /læ-t ∂ -r ∂ l/.

Another syllabic consonant sound in English is /n/, as in

butt-<u>on</u>/bAt-n/

cott-on /kpt-n/

doz-ens/dAz-nz/

doe-s<u>n't</u> /d Λ z-nt/.

Another special lateral consonant sound is /r/ as heard in

<u>r</u>ain /rain/

lorry /lori/

characterization /kær∂kt∂raizei∫∂n/

The lateral /r/ can be vocalic and non-vocalic, thus we speak of vocalic 'r' and non-vocalic 'r'. A vocalic 'r' is the one that appears in a context where it must be articulated, that is 'r' followed by a vowel sound, as in

/rein/ rain

/lɔri/ lo<u>rr</u>y

/kær∂kt∂raizei∫∂n/ characterization.

The lateral 'r' becomes non-vocalic, unarticulated if it is followed by a consonant sound or a full stop, as in, /ka: $f\partial$ mai fæmili/ "car for my family". It will be phonologically wrong to articulate /ka:r f ∂ r mai fæmili/, as that is contrary to the BBC English which has been adopted as the standard accent (cf. Uzoezi; 1992, also Roach; 2000). In an international communication, articulations that do not conform to the standard have the capability of affecting understanding adversely. The interlocutors may not be able to decode accurately, thereby missing the essence of the message. Wells (1996) speaks of the possibility of the rejection of a message delivered in a substandard accent, as the interlocutor may begin to look down on the speaker of such an accent and the message. He explicates that in his theory of "intelligibility versus acceptability".

The other lateral consonant sounds are

[w], a bi-labial lateral consonant sound heard in words such as

waste /weist/

waist /weist/

wicked /wikid/

witches /witjiz/

rewind /riwaind/

be<u>w</u>itch /biwit∫/

re<u>w</u>ire /riwai∂/

hay-wire /heiwai∂/

Like the glottal fricative consonant sound [h], the bi-labial lateral-approximant [l] does not make a final position of occurrence in words. It is only heard in initial and medial positions of occurrence in words.

[j], a palato-alveolar lateral consonant sound is heard in words such as

<u>y</u>am /jæm/

<u>v</u>ear /je∂/

<u>y</u>es /jes/

<u>y</u>east /ji:st/

Riyad /rijæd/

europe /ju∂r∂p/

Eunice /ju:nis/

<u>u</u>nion /ju:nj∂n/

unite /ju:nait/

university /ju;niv∂siti/

The sound [j] is not typographically obvious in its cluster with other consonant sounds in some words, as in

/nju:/ new

/fju:/ few

/pju:/ pew

/stju:/ stew

/hju:/ hew

www.iiste.org

THE SIGNIFICANCE OF THE SOUNDS IN COMMUNICATION

The knowledge of the sounds of a language is significant in human linguistic communication, and that of English is not different. As a result of imperfect learning and other linguistic factors, some people find it difficult to articulate some English words appropriately, thereby impeding communication in the language. In discussing the orthography of the English language in relation to other languages, Williamson (1984) identifies the lack of correlation of the orthographies as the reason for people's poor articulation of some English words. Actually some letters of the English alphabet are not present in the native languages (L1s) of some of the non-natives who use English in communication. The elements of their mother tongues (MTs) have become fossilized in them, and as a result, they find it difficult to cope where there is no correlation between their language(s) and English. This lack of correlation accounts for cases of MT-interference in some non-native English speech. Some examples of such interference include

a) the typical Hausa's English speech or accent in expressions such as

/fi:f∂l/ instead of /pi:pl/ people

/rib3:s/ instead of /riv3:s/ reverse

/ribais/ instead of /rivaiz/ revise

/pi;zis/ instead of /fiziks/ physics

/eif/ instead of /eip/ ape

/paib/ instead of /faiv/ five

b) the typical Yoruba's English speech or accent in expressions such as

/rif ∂ / instead of /riv ∂ / river

/refison/ for /rivi3n/ revision

/refaif∂l/ for /rivaiv∂l/ revival

/ref∂rend/ for /rev∂rend/ reverend

/sebr∂/ for /zibr∂/ zebra

/su:/ for /zu:/ zoo

/bi:si/ instead of /bi:zi/ busy

/telefison/ instead of /televi3∂n/ television

/neison/ instead of /nei∫∂n/ nation

/sug∂/ instead of /jug∂/ sugar

/inglisi/ instead of /ingli∫/ English

c) the typical Idoma and Igala English speech in expressions such as

/dzu:/ instead of /zu:/ zoo

/t]3:t/ instead of /]3:t/ shirt

/t $\int dud_3 \partial$ / instead of /s $\partial uld_3 \partial$ / soldier

/rætjitj/ instead of /ræjiz/ rashes

/lɔtʃitʃ/ instead of /lɔsiz/ losses

/kɔt/t/ instead of /kɔst/ cost

 $t \partial up$ instead of $s \partial up$ soap

/rid3t/ instead of /rizAlt/ result

d) the typical Igbo speaker of English has a very heavy accent and stresses the vowel sound so unnecessarily. This aspect is more noticeable in the prosody of the language. One other feature of the Igbo English speech is the issue of nasalization. This is the addition of nasal escape of air to a sound which would not normally have it. Examples include

/if hi: nkoms t ∂ ju:/ instead of /if hi: kAmz t ∂ ju:/ if he comes to you

/npau ∂ npau ∂ / instead of /pau ∂ r æn pau ∂ / power and power

/hi:z nɔt hi∂riŋ mi n/ instead of /hi: kæn∂t hi∂ mi/ he cannot hear me

Some introduce extra vowel sounds where they should not be, as in

/teibulu/ instead of /teibl/ table

/bɔ:lu/ instead of /bɔ:l/ ball

/kɔ:pu/ instead of /k Λ p/ cup

/gla:si/ instead of /gla:s/ glass

/desiki/ instead of /desk/ desk

CONCLUSION

The above illustrations of the sounds of English show that communication in English depends on the knowledge one has of the sounds of the language. Inadequate knowledge or imperfect learning of the sounds of the language will amount to inaccuracy in communication in the language.

What should be done therefore is that communicators should do their best to attain the standard English pronunciation, that is for people who communicate in English. The argument has been that the standard English pronunciation like the BBC accent is almost unattainable. Even though it is almost unattainable, speakers should strive towards it since our communication may not just be within the confines of our nation but beyond, that is, communicating internationally.

Communication experts should study phonetics and phonology as that would give them the required expertise in speech, that is, using the correct accent in the language of communication. For students of mass communication and others in school of journalism, phonetics and phonology should be a major course which they should study thoroughly so as to be able to communicate with the required articulation. It is professionally horrible to hear a broadcaster in any of the media organisations casting news or anchoring a programme using an accent marked

with his MT-interference. Such a speech would suffer rejection and the message may not be passed to the target audience. Phonology is indeed relevant to communication studies.

REFERENCE

- Akmajian et al; *Linguistics: An Introduction to Language and Communication*; Cambridge: MIT Press; 2007.
- Grant, N.J.H; Nnamonu, S & Jowitt, D; *Senior English Project*, Books 1 3; London: London; 2008.

Katz, J; The Philosophy of Language; New York: Harper and Row; 1966.

O'Oconnor, J.D; Phonetics; London: Penguin; 1991.

Omachonu, G.S; *Fundamentals of English Phonetics and Phonology*; Enugu: Rossen Pub. Ltd; 2010.

Roach, P; English Phonetics and Phonology; Cambridge: CUP; 2000.

Sampson, G; Schools of Linguistics; London: Hutchinson; 1980.

Uzoezi, R.U; Phonetics and Phonology of English; Onitsha: Hybrid Pub. Ltd; 1992.

Wells, J.C. & Colson, G; Practical Phonetics; London: Pitmand Publishers; 1975.

Williamson, K; Practical Orthography in Nigeria; Ibadan: HEB Ltd; 1984.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage: <u>http://www.iiste.org</u>

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: <u>http://www.iiste.org/journals/</u> All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: <u>http://www.iiste.org/book/</u>

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library, NewJour, Google Scholar

