

**OFFICIAL AND NATIONAL LANGUAGES
IN THE CONTEMPORARY WORLD**



A Computer Science Learning Evidence
Presented to the Faculty of the College of Information and Computing
University of Southeastern Philippines
Bo Obrero, Davao City

Learning Evidence Submitted in Partial Fulfillment of the Requirements for
CSDS 326 – SOCIAL NETWORK ANALYSIS

De Villena, Francis Nathanael
Moreno, Kristian

Adviser
Rogers, Jamal Kay

May 2022

APPROVAL SHEET

The Computer Science Social Network Analysis Project entitled OFFICIAL AND NATIONAL LANGUAGES IN THE CONTEMPORARY WORLD, prepared and submitted by Francis Nathanael De Villena and Kristian Moreno in partial fulfillment of the requirement for the CSDS 326 – SOCIAL NETWORK ANALYSIS has been examined and is hereby recommended for an oral examination, acceptance, and approval.

Jamal Kay Rogers
Adviser

ACKNOWLEDGEMENT

First and foremost, we would like to give utmost appreciation to our most gracious and Almighty God who guided us and gave us strength in working on this project and the path of life. Secondly, our parents and family have always loved and supported us throughout our lives. Lastly, we would like to thank our course instructor, Mr. Jamal Kay Rogers, for giving us the knowledge of the fundamental lessons of Social Network Analysis which is considered one of the most important cornerstones of Computer Science, and for helping us finish this project.

ABSTRACT

In the contemporary world, the official and national languages of different countries are somewhat similar to each other. This paper provides an overview of the official and national languages in the contemporary world. The paper discusses the similarities and differences between national languages and official languages, furthermore, the paper also discusses the origins and family from which the national languages of a certain country originated from. The data and variables in the study provide an insight into the language's origin, how it spread, and how it dominated the modern world as we know it today. The results show that languages from colonists in the western empires have dominated the modern world because of their deep influence in the countries they colonized.

TABLE OF CONTENTS

| | |
|--|----|
| TITLE | 1 |
| APPROVAL SHEET | 2 |
| ACKNOWLEDGEMENT | 3 |
| ABSTRACT..... | 4 |
| TABLE OF CONTENTS..... | 5 |
| LIST OF FIGURES | 6 |
| LIST OF TABLES | 7 |
| CHAPTER 1: INTRODUCTION | 8 |
| 1.1 Background of the Study | 8 |
| 1.2 Statement of the Problem | 8 |
| 1.3 Significance of the Study | 9 |
| 1.4 Scope and Limitations | 9 |
| 1.5 Definition of Terms | 9 |
| CHAPTER 2: REVIEW OF RELATED LITERATURE..... | 11 |
| 2.1 Related Literature | 11 |
| 2.1.1 Official and National Language | 11 |
| 2.1.2 Lingua Franca..... | 12 |
| 2.2 Conceptual and Theoretical Framework of the Study..... | 12 |
| CHAPTER 3: METHODOLOGY | 14 |
| 3.1 General Methodological Approach | 14 |
| 3.2 Data Collection..... | 14 |
| 3.3 Data Processing | 14 |
| 3.4 Ethical Consideration | 15 |
| CHAPTER 4: RESULTS AND DISCUSSION..... | 23 |
| CHAPTER 5: SUMMARY, CONCLUSION, AND RECOMMENDATION..... | 29 |
| 5.1 Summary | 29 |
| 5.2 Conclusion..... | 29 |
| 5.3 Recommendation..... | 30 |
| APPENDICES | 31 |
| REFERENCES | 32 |

LIST OF FIGURES

- 1 Conceptual Framework
- 2 Methodological Approach
- 3 Infographic
- 4 Official and National Language Network
- 5 Louvain Detection Algorithm Community Graph
- 6 k-Core 1-5 Structure Graph
- 7 English Ego Graph
- 8 French Ego Graph
- 9 Arabic Ego Graph
- 10 Spanish Ego Graph

LIST OF TABLES

- 1 Einar Haugen's Four-box Matrix
- 2 Official Languages of Countries and Territories
- 3 Network Centrality

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Language is a set of customary verbal, manual, or written symbols that humans use to communicate or convey ideas and thoughts to others [1]. It is a communication medium developed by a specific community for interaction and communication, as well as a method of individual expression [2]. Language and culture are inextricably linked; the two are so intimately intertwined that one cannot separate them without losing important parts of either language or culture [3]. As a result, language often serves as an amalgamating element in retaining national identity and fostering national unity [4]. The contemporary or modern world as we know it became smaller as development in communications and technologies brought by globalization made it possible to communicate with someone despite the vast distances. In this globalized world where economies and cultures intertwine and interact with each other more, language and communication barriers are no longer an issue [15]. More countries chose to integrate or incorporate a second language that people can use and understand despite their cultural differences. Lingua franca or trade language refers to a language that a majority uses and that people from different backgrounds use to communicate for trading, business, politics, and academics [15,16]. However, there is no such thing as “one lingua franca”, as different regions in the world use different languages as their lingua franca. Any language that is regularly used by people whose native language is different from one another is considered lingua franca [16].

1.2 Statement of the Problem

The world as we know it becomes smaller as a result of the development brought upon by globalization. As information and knowledge spread faster in the globalized world, a unified global language is needed to easily communicate the advancements made in the world. Lingua franca or trade language also referred to as a bridging

language is a language used solely by individuals with different origins language for trade, business, and politics [16, 20]. European languages spread around the world through colonialism. The bloodshed brought upon by the imperial colonialism of the Western empires has made their language an international tool for communication.[17,19, 20]. Due to this reason, some countries deeply influenced by their colonizers opted out to use their oppressors' language as their official language even after they regained their independence [9, 7].

1.3 Significance of the Study

This paper primarily aims to explore and shed light on the underlying state of affairs of the world's official and national languages through social network analysis and data visualization, hoping that the findings of this study will contribute to related sociolinguistic research.

1.4 Scope and Limitations

The coverage of this study is only exclusive to the national and official languages of sovereign states and their subject territories. Though some states specified none, their *de facto* national language will be taken into account regardless. Moreover, recognized minority and regional languages are ruled out.

1.5 Definition of Terms

Official language - refers to the language of a country for official use such as judicial, legislation, and administration.

National language - refers to the language used widely by the populace, it is different from the official language.

Lingua franca - refers to the collective language used by individuals of different tongues to communicate with each other; it is also referred to as bridging/trade language.

Dashboard - a graphical representation of all the user's data, it is often used to provide an overview of the entire dataset.

Colonialism - refers to the practice in which an entity/country acquires territories from another entity/country, gradually occupying and exploiting the conquered territories.

The contemporary world - refers to the present age.

Endoglossic - refers to the indigenous language that is currently used as the official or first language in a country.

Exoglossic - refers to the non-indigenous language that is currently used as the official or first language in a country.

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 RELATED LITERATURE

2.1.1 Official and National Language

An official language is defined as the language that is lawfully designated by a particular state to conduct day-to-day governmental affairs [3,10]. On the other hand, a national language is defined as the language shared in common among the people of the state, and does not imply anything regarding its legal status other than representing the nation as a symbol of national unity [3,10]. While some states refer to an official language as a national language, the terms do not necessarily coincide [2,3,10]. The legality of official languages varies across the world based on the institution, role, and jurisdiction [3]. It is conceivable for a language to be national and have official status, but the reverse is not always the case [3]. The functioning of official and national languages may also differ. Most sovereign countries have a sole national language that also has de jure status, while others have no national language but have several official languages. A few specify neither, however, when a particular language has been entrenched but not legally specified, it has a de facto status and could be considered national [3]. In many instances, the language of the previous colonial power is at least an official language in newly independent states. Although it is uncommon, the official language might be a non-local indigenous or introduced language that is not the language of the former colonizer [3]. A variety of national languages may be spoken by specific communities or individuals within linguistically heterogeneous states, whether territorially concentrated or dispersed [3]. More than one official language may be designated by a multilingual state [3,10]. Furthermore, in both unitary and federal governments, official language status might vary between areas within a state [3].

2.1.2 *Lingua Franca*

The Lingua franca or trade language refers to the language used by many to communicate for trading, business, politics, and academics. The lingua franca is a unified bridging language, meaning that this language is different from the native speaker's. Any language that is spoken or used in communicating by people with different tongues is considered lingua franca [15]. With the changes brought by globalization, the usage of lingua franca becomes significantly relevant as different cultures are interacting more frequently than ever [15,16]. In the globalized world where everything is interconnected, the need for a global language becomes a very relevant subject. Different regions in the world use different lingua franca from each other. In the modern world, English is the most used lingua franca due to colonization and the widespread teaching of English in the academic setting. Today, native English speakers are outnumbered by non-native speakers as it is the most used language in international trade, intercultural communication, and academic teachings [16, 17].

2.2 CONCEPTUAL AND THEORETICAL FRAMEWORK

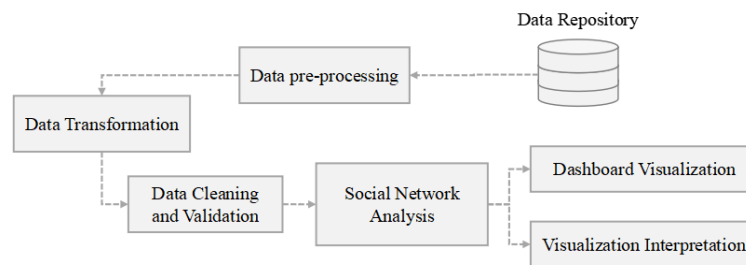


Figure 1 – Conceptual Framework

This study recognizes the intellectuals who contributed significantly to the body of knowledge related to sociolinguistics and geopolitics that lay the foundation for the investigation of the problem statement and the research questions. The proponents have deduced the data and the processes involved to achieve the objectives of the study: exploring national and official language through Einar Haugen's four aspects of

language, in which he expounds on his four-step model of standardization with the key concepts selection of norm, codification of form, acceptance by the community, and elaboration of function. The first two are about form, whereas the latter two are about linguistic function. The first and third are involved with society, whereas the first and third are focused on language. They constitute a matrix inside which all of a nation's sign language and dialect issues should be discussed [5]:

Table 1 – Einar Haugen's Four-box Matrix

| | Form | Function |
|-----------------|--------------|-----------------|
| Society | Selection | Acceptance |
| Language | Codification | Elaboration |

CHAPTER 3

METHODOLOGY

3.1 General Methodological Approach

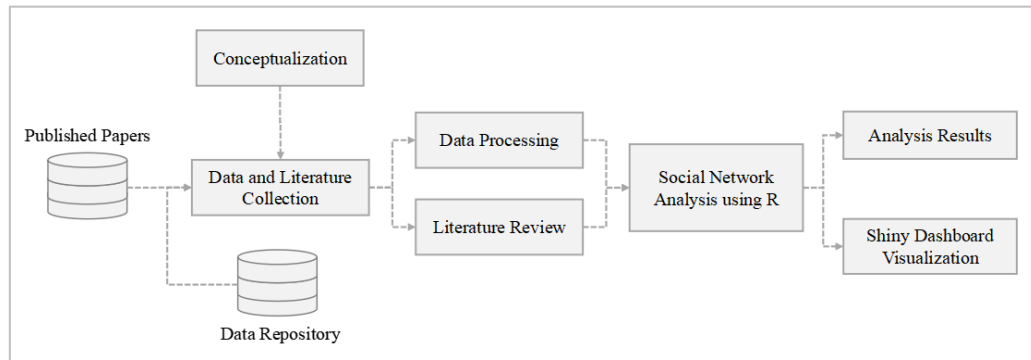


Figure 2 – Methodological Approach

The proponents will employ the social network analysis with R statistical programming language and data visualization with Tableau to unravel the answers to the research questions. A shiny application will also be implemented for the dashboard of this study as well.

3.2 Data Collection

The dataset was gathered from, Netzscheuler, a publicly accessible catalog and repository of network datasets to aid scientific research. This particular dataset contains a bipartite network of official and national languages as well as the countries in which they are spoken, as estimated by Unicode.

3.3 Data Processing

Countries and territories were arranged lexicographically based on their ISO 3166-1 Alpha 2 code, which is an internationally recognized code that designates every country and most of the dependent areas with a two-letter combination, rather than their name. Moreover, they were classified into 17 sub-regional groups in accordance with the United Nations geoscheme. The classification of language family was derived from Glottolog, a bibliographic database of the world's lesser-known languages, developed

and maintained first at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany.

3.4 Ethical Consideration

This study does not involve any individual and personal information during data collection since the data are not gathered first-hand and only analyze secondary data that are available online for public access from a certain non-government organization. Secondary data has been opted for as it is easily accessible compared to primary data and requires little to no cost and time to acquire. The data collected are open-source and free for public use, no malpractices such as piracy are involved in the data gathering process. Thus, the research does not breach any ethical concerns.

Table 2 – Official Languages of Countries and Territories

| ISO 3166-1 | Country / Territory | Subregion | Official and National Languages | Language Family |
|------------|-----------------------|---------------------------|---|---|
| AC | Ascension Island | Western Africa | English | Indo-European |
| AD | Andorra | Southern Europe | Catalan | Indo-European |
| AE | United Arab Emirates | Western Asia | Arabic | Afro-Asiatic |
| AF | Afghanistan | Southern Asia | Dari Pashto | Indo-European Indo-European |
| AG | Antigua & Barbuda | Caribbean | English | Indo-European |
| AI | Anguilla | Caribbean | English | Indo-European |
| AL | Albania | Southern Europe | Albanian | Indo-European |
| AM | Armenia | Western Asia | Armenian | Indo-European |
| AO | Angola | Middle Africa | Portuguese | Indo-European |
| AQ | Antarctica | Antarctica | None | None |
| AR | Argentina | South America | Spanish | Indo-European |
| AS | American Samoa | Polynesia | Samoan English | Polynesian Indo-European |
| AT | Austria | Western Europe | German | Indo-European |
| AU | Australia | Australia and New Zealand | English | Indo-European |
| AW | Aruba | Caribbean | Dutch Papiamentu | Indo-European Indo-European |
| AX | Aland Islands | Northern Europe | Swedish | Indo-European |
| AZ | Azerbaijan | Western Asia | Azerbaijani | Turkic |
| BA | Bosnia & Herzegovina | Southern Europe | Bosnian Croatian Serbian | Indo-European Indo-European Indo-European |
| BB | Barbados | Caribbean | English | Indo-European |
| BD | Bangladesh | Southern Asia | Bengali | Indo-European |
| BE | Belgium | Western Europe | Dutch French German | Indo-European Indo-European Indo-European |
| BF | Burkina Faso | Western Africa | French | Indo-European |
| BG | Bulgaria | Eastern Europe | Bulgarian | Indo-European |
| BH | Bahrain | Western Asia | Arabic | Afro-Asiatic |
| BI | Burundi | Eastern Africa | French Kirundi | Indo-European Atlantic-Congo |
| BJ | Benin | Western Africa | French | Indo-European |
| BL | St. Barthelemy | Caribbean | French | Indo-European |
| BM | Bermuda | North America | English | Indo-European |
| BN | Brunei | South-eastern Asia | Malay | Austronesia |
| BO | Bolivia | South America | Aymara Guarani Quechua Spanish | Aymaran Tupian Quechuan Indo-European |
| BQ | Caribbean Netherlands | Caribbean | Dutch Papiamentu | Indo-European Indo-European |
| BR | Brazil | South America | Portuguese | Indo-European |
| BS | Bahamas | Caribbean | English | Indo-European |
| BT | Bhutan | Southern Asia | Dzongkha | Sino-Tibetan |
| BV | Bouvet Island | South America | Norwegian | Indo-European |
| BW | Botswana | Southern Africa | English Tswana | Indo-European Atlantic-Congo |

| | | | | |
|----|--------------------------|------------------------------|--|--|
| BY | Belarus | Eastern Europe | Belarusian Russian | Indo-European Indo-European |
| BZ | Belize | Central America | English | Indo-European |
| CA | Canada | North America | English French | Indo-European Indo-European |
| CC | Cocos (Keeling) Islands | Australia and New Zealand | Cocos Malay English | Austronesian Indo-European |
| CD | Congo-Kinshasa | Middle Africa | French | Indo-European |
| CF | Central African Republic | Middle Africa | French | Indo-European |
| CG | Congo-Brazzaville | Middle Africa | French | Indo-European |
| CH | Switzerland | Western Europe | French German Italian | Indo-European Indo-European Indo-European |
| CI | Cote d'Ivoire | Western Africa | French | Indo-European |
| CK | Cook Islands | Polynesia | English | Indo-European |
| CL | Chile | South America | Spanish | Indo-European |
| CM | Cameroon | Middle Africa | English French | Indo-European Indo-European |
| CN | China | Eastern Asia | Mandarin | Sino-Tibetan |
| CO | Colombia | South America | Spanish | Indo-European |
| CR | Costa Rica | Central America | Spanish | Indo-European |
| CU | Cuba | Caribbean | Spanish | Indo-European |
| CV | Cape Verde | Western Africa | Portuguese | Indo-European |
| CW | Curacao | Caribbean | Dutch Papiamentu | Indo-European Indo-European |
| CX | Christmas Island | Australia and New Zealand | English | Indo-European |
| CY | Cyprus | Western Asia | Greek Turkish | Indo-European Indo-European |
| CZ | Czechia | Eastern Europe | Czech | Indo-European |
| DE | Germany | Western Europe | German | Indo-European |
| DJ | Djibouti | Eastern Africa | Arabic French | Afro-Asiatic Indo-European |
| DK | Denmark | Northern Europe | Danish | Indo-European |
| DM | Dominica | Caribbean | English | Indo-European |
| DO | Dominican Republic | Caribbean | Spanish | Indo-European |
| DZ | Algeria | Northern Africa | Arabic Tamazight | Afro-Asiatic Afri-Asiatic |
| EC | Ecuador | South America | Spanish | Indo-European |
| EE | Estonia | Northern Europe | Estonian | Uralic |
| EG | Egypt | Northern Africa | Arabic | Afro-Asiatic |
| EH | Western Sahara | Northern Africa | Arabic Spanish | Afro-Asiatic Indo-European |
| ER | Eritrea | Eastern Africa | Arabic English Tigrinya | Afro-Asiatic Indo-European Afro-Asiatic |
| ES | Spain | Southern Europe | Spanish | Indo-European |
| ET | Ethiopia | Eastern Africa | Afar Amharic Oromo Somali Tigrinya | Afro-Asiatic Afro-Asiatic Afro-Asiatic Afro-Asiatic Afro-Asiatic |
| FI | Finland | Northern Europe | Finnish Swedish | Uralic Indo-European |

| | | | | |
|----|--|---------------------------|----------------------------------|---|
| FJ | Fiji | Melanesia | English Fiji Hindi Fijian | Indo-European Indo-European Austronesian |
| FK | Falkland Islands | South America | English | Indo-European |
| FM | Federated States of Micronesia | Micronesia | English | Indo-European |
| FO | Faroe Islands | Northern Europe | Danish Faroese | Indo-European Indo-European |
| FR | France | Western Europe | French | Indo-European |
| GA | Gabon | Middle Africa | French | Indo-European |
| GB | United Kingdom | Northern Europe | English | Indo-European |
| GD | Grenada | Caribbean | English | Indo-European |
| GE | Georgia | Western Asia | Georgian | Kartvelian |
| GF | French Guiana | South America | French | Indo-European |
| GG | Guernsey | Northern Europe | English French Guernesiais | Indo-European Indo-European Indo-European |
| GH | Ghana | Western Africa | English | Indo-European |
| GI | Gibraltar | Southern Europe | English | Indo-European |
| GL | Greenland | North America | Danish Kalaallisut | Indo-European Eskimo-Aleut |
| GM | Gambia | Western Africa | English | Indo-European |
| GN | Guinea | Western Africa | French | Indo-European |
| GP | Guadeloupe | Caribbean | French | Indo-European |
| GQ | Equatorial Guinea | Middle Africa | French Portuguese Spanish | Indo-European Indo-European Indo-European |
| GR | Greece | Southern Europe | Greek | Indo-European |
| GS | South Georgia & South Sandwich Islands | South America | English | Indo-European |
| GT | Guatemala | Central America | Spanish | Indo-European |
| GU | Guam | Micronesia | Chamorro English | Austronesian Indo-European |
| GW | Guinea-Bissau | Western Africa | Portuguese | Indo-European |
| GY | Guyana | South America | English | Indo-European |
| HK | Hong Kong | Eastern Asia | Cantonese English | Sino-Tibetan Indo-European |
| HM | Heard & McDonald Islands | Australia and New Zealand | English | Indo-European |
| HN | Honduras | Caribbean | Spanish | Indo-European |
| HR | Croatia | Southern Europe | Croatian | Indo-European |
| HT | Haiti | Caribbean | French Kreyol Ayisyen | Indo-European Indo-European |
| HU | Hungary | Eastern Europe | Hungarian | Uralic |
| IC | Canary Islands | Western Africa | Spanish | Indo-European |
| ID | Indonesia | South-eastern Asia | Indonesian | Austronesian |
| IE | Ireland | Northern Europe | English Irish | Indo-European Indo-European |
| IL | Israel | Western Asia | Hebrew | Afro-Asiatic |
| IM | Isle of Man | Northern Europe | English | Indo-European |
| IN | India | Southern Asia | English Hindi | Indo-European Indo-European |
| IO | British Indian Ocean Territory | Eastern Africa | English | Indo-European |
| IQ | Iraq | Western Asia | Arabic Kurdish | Afro-Asiatic Indo-European |

| | | | | |
|----|-------------------|--------------------|--------------------------------------|---|
| IR | Iran | Southern Asia | Farsi | Indo-European |
| IS | Iceland | Northern Europe | Icelandic | Indo-European |
| IT | Italy | Southern Europe | Italian | Indo-European |
| JE | Jersey | Northern Europe | English Jerriais Jersey French | Indo-European Indo-European Indo-European |
| JM | Jamaica | Caribbean | English | Indo-European |
| JO | Jordan | Western Asia | Arabic | Afro-Asiatic |
| JP | Japan | Eastern Asia | Japanese | Japonic |
| KE | Kenya | Eastern Africa | English Swahili | Indo-European Atlantic-Congo |
| KG | Kyrgyzstan | Central Asia | Kyrgyz Russian | Turkic Indo-European |
| KH | Cambodia | South-eastern Asia | Khmer | Austroasian |
| KI | Kiribati | Micronesia | English Gilbertese | Indo-European Austronesian |
| KM | Comoros | Eastern Africa | Arabic Comorian French | Afro-Asiatic Atlantic-Congo Indo-European |
| KN | St. Kitts & Nevis | Caribbean | English | Indo-European |
| KP | North Korea | Eastern Asia | Korean | Koreanic |
| KR | South Korea | Eastern Asia | Korean | Koreanic |
| KW | Kuwait | Western Asia | Arabic | Afro-Asiatic |
| KY | Cayman Islands | Caribbean | English | Indo-European |
| KZ | Kazakhstan | Central Asia | Kazakh Russian | Turkic Indo-European |
| LA | Laos | South-eastern Asia | Lao | Tai-Kadai |
| LB | Lebanon | Western Asia | Arabic | Afro-Asiatic |
| LC | St. Lucia | Caribbean | English | Indo-European |
| LI | Liechtenstein | Western Europe | German | Indo-European |
| LK | Sri Lanka | Southern Asia | Sinhala Tamil | Indo-European Dravidan |
| LR | Liberia | Western Africa | English | Indo-European |
| LS | Lesotho | Southern Africa | English Sesotho | Indo-European Atlantic-Congo |
| LT | Lithuania | Northern Europe | Lithuania | Indo-European |
| LU | Luxembourg | Western Europe | French German Luxembourgish | Indo-European Indo-European Indo-European |
| LV | Latvia | Northern Europe | Latvian | Indo-European |
| LY | Libya | Northern Africa | Arabic | Afro-Asiatic |
| MA | Morocco | Northern Africa | Arabic Tamazight | Afro-Asiatic Afro-Asiatic |
| MC | Monaco | Western Europe | French | Indo-European |
| MD | Moldova | Eastern Europe | Romanian | Indo-European |
| ME | Montenegro | Southern Europe | Montenegrin | Indo-European |
| MF | St. Martin | Caribbean | French | Indo-European |
| MG | Madagascar | Eastern Africa | French Malagasy | Indo-European Austronesian |
| MH | Marshall Islands | Micronesia | English Marshallese | Indo-European Austronesian |
| MK | North Macedonia | Southern Europe | Albanian Macedonian | Indo-European Indo-European |
| ML | Mali | Western Africa | French | Indo-European |

| | | | | |
|----|--------------------------|------------------------------|-----------------------------------|--|
| MM | Myanmar | South-eastern Asia | Burmese | Sino-Tibetan |
| MN | Mongolia | Eastern Asia | Mongolian | Mongolic |
| MO | Macau | Eastern Asia | Mandarin Portuguese | Sino-Tibetan Indo-European |
| MP | Northern Mariana Islands | Micronesia | Carolignan Chamorro English | Austronesian Austronesian Indo-European |
| MQ | Martinique | Caribbean | French | Indo-European |
| MR | Mauritania | Western Africa | Arabic | Afro-Asiatic |
| MS | Montserrat | Caribbean | English | Indo-European |
| MT | Malta | Southern Europe | English Maltese | Indo-European Afro-Asiatic |
| MU | Mauritius | Eastern Africa | English French | Indo-European Indo-European |
| MV | Maldives | Southern Asia | Dhivehi | Indo-European |
| MW | Malawi | Eastern Africa | Chewa English | Atlantic-Congo Indo-European |
| MX | Mexico | Central America | Spanish | Indo-European |
| MY | Malaysia | South-eastern Asia | Malay | Austronesian |
| MZ | Mozambique | Eastern Africa | Portuguese | Indo-European |
| NA | Namibia | Southern Africa | Afrikaans English | Indo-European Indo-European |
| NC | New Caledonia | Melanesia | French | Indo-European |
| NE | Niger | Western Africa | French | Indo-European |
| NF | Norfolk Island | Australia and New Zealand | English Norfolk | Indo-European Indo-European |
| NG | Nigeria | Western Africa | English | Indo-European |
| NI | Nicaragua | Central America | Spanish | Indo-European |
| NL | Netherlands | Western Europe | Dutch | Indo-European |
| NO | Norway | Northern Europe | Norwegian Saami | Indo-European Uralic |
| NP | Nepal | Southern Asia | Nepali | Indo-European |
| NR | Nauru | Micronesia | English | Indo-European |
| NU | Niue | Polynesia | English Niuean | Indo-European Austronesian |
| NZ | New Zealand | Australia and New Zealand | English Maori | Indo-European Austronesian |
| OM | Oman | Western Asia | Arabic | Afro-Asiatic |
| PA | Panama | Central America | Spanish | Indo-European |
| PE | Peru | South America | Aymara Quechua Spanish | Aymaran Quechuan Indo-European |
| PF | French Polynesia | Polynesia | French | Indo-European |
| PG | Papua New Guinea | Melanesia | English Hiri Motu Tok Pisin | Indo-European Austronesian Indo-European |
| PH | Philippines | South-eastern Asia | English Filipino | Indo-European Austronesian |
| PK | Pakistan | Southern Asia | English Urdu | Indo-European Indo-European |
| PL | Poland | Eastern Europe | Polish | Indo-European |
| PM | St. Pierre & Miquelon | North America | French | Indo-European |
| PN | Pitcairn Islands | Polynesia | English Pitkern | Indo-European Indo-European |

| | | | | |
|----|-----------------------------|--------------------|---|--|
| PR | Puerto Rico | Caribbean | English Spanish | Indo-European Indo-European |
| PS | Palestine | Western Asia | Arabic | Afro-Asiatic |
| PT | Portugal | Southern Europe | Portuguese | Indo-European |
| PW | Palau | Micronesia | English Japanese Palauan | Indo-European Japonic Austronesian |
| PY | Paraguay | South America | Guarani Spanish | Tupian Indo-European |
| QA | Qatar | Western Asia | Arabic | Afro-Asiatic |
| RE | Reunion | Eastern Africa | French | Indo-European |
| RO | Romania | Eastern Europe | Romanian | Indo-European |
| RS | Serbia | Southern Europe | Serbian | Indo-European |
| RU | Russia | Eastern Europe | Russian | Indo-European |
| RW | Rwanda | Eastern Africa | English French Kinyarwanda Swahili | Indo-European Indo-European Atlantic-Congo Atlantic-Congo |
| SA | Saudi Arabia | Western Asia | Arabic | Afro-Asiatic |
| SB | Solomon Islands | Melanesia | English | Indo-European |
| SC | Seychelles | Eastern Africa | English French Seychellois | Indo-European Indo-European Indo-European |
| SD | Sudan | Northern Africa | Arabic English | Afro-Asiatic Indo-European |
| SE | Sweden | Northern Europe | Swedish | Indo-European |
| SG | Singapore | South-eastern Asia | English Malay Mandarin Tamil | Indo-European Austronesian Sino-Tibetan Dravidian |
| SH | St. Helena | Western Africa | English | Indo-European |
| SI | Slovenia | Southern Europe | Slovene | Indo-European |
| SJ | Svalbard & Jan Mayen | Northern Europe | Norwegian | Indo-European |
| SK | Slovakia | Eastern Europe | Slovak | Indo-European |
| SL | Sierra Leone | Western Africa | English | Indo-European |
| SM | San Marino | Southern Europe | Italian | Indo-European |
| SN | Senegal | Western Africa | French | Indo-European |
| SO | Somalia | Eastern Africa | Arabic Somali | Afro-Asiatic Afro-Asiatic |
| SR | Suriname | South America | Dutch | Indo-European |
| SS | South Sudan | Eastern Africa | Arabic English | Afro-Asiatic Indo-European |
| ST | Sao Tome & Principe | Middle Africa | Portuguese | Indo-European |
| SV | El Salvador | Central America | Spanish | Indo-European |
| SX | Sint Maarten | Caribbean | Dutch English | Indo-European Indo-European |
| SY | Syria | Western Asia | Arabic | Afro-Asiatic |
| SZ | Eswatini | Southern Africa | English Swazi | Indo-European Atlantic-Congo |
| TA | Tristan da Cunha | Western Africa | English | Indo-European |
| TC | Turks & Caicos Islands | Caribbean | English | Indo-European |
| TD | Chad | Middle Africa | Arabic French | Afro-Asiatic Indo-European |
| TF | French Southern Territories | Eastern Africa | French | Indo-European |

| | | | | |
|----|--------------------------|--------------------|--|---|
| TG | Togo | Western Africa | French | Indo-European |
| TH | Thailand | South-eastern Asia | Thai | Tai-Kadai |
| TJ | Tajikistan | Central Asia | Russian Tajik | Indo-European Indo-European |
| TK | Tokelau | Polynesia | English Tokelauan | Indo-European Austronesian |
| TL | Timor-Leste | South-eastern Asia | Portuguese Tetum | Indo-European Austronesian |
| TM | Turkmenistan | Central Asia | Turkmen | Turkic |
| TN | Tunisia | Northern Africa | Arabic French | Afro-Asiatic Indo-European |
| TO | Tonga | Polynesia | English Tongan | Indo-European Austronesian |
| TR | Turkey | Western Asia | Turkish | Turkic |
| TT | Trinidad & Tobago | Caribbean | English | Indo-European |
| TV | Tuvalu | Polynesia | English Tuvaluan | Indo-European Austronesian |
| TW | Taiwan | Eastern Asia | Mandarin | Sino-Tibetan |
| TZ | Tanzania | Eastern Africa | English Swahili | Indo-European Atlantic-Congo |
| UA | Ukraine | Eastern Europe | Russian Ukrainian | Indo-European Indo-European |
| UG | Uganda | Eastern Africa | English Swahili | Indo-European Atlantic-Congo |
| UM | US Outlying Islands | Micronesia | English | Indo-European |
| US | United States | North America | English | Indo-European |
| UY | Uruguay | South America | Spanish | Indo-European |
| UZ | Uzbekistan | Central Asia | Uzbek | Turkic |
| VA | Vatican City | Southern Europe | Italian | Indo-European |
| VC | St. Vincent & Grenadines | Caribbean | English | Indo-European |
| VE | Venezuela | South America | Spanish | Indo-European |
| VG | British Virgin Islands | Caribbean | English | Indo-European |
| VI | US Virgin Islands | Caribbean | English | Indo-European |
| VN | Vietnam | South-eastern Asia | Vietnamese | Austroasiatic |
| VU | Vanuatu | Melanesia | Bislama English | Indo-European Indo-European |
| WF | Wallis & Futuna | Polynesia | French | Indo-European |
| WS | Samoa | Polynesia | Samoan English | Polynesian Indo-European |
| YE | Yemen | Western Asia | Arabic | Afro-Asiatic |
| YT | Mayotte | Eastern Africa | French | Indo-European |
| ZA | South Africa | Southern Africa | Afrikaans English Sesotho Swazi Tswana | Indo-European Indo-European Atlantic-Congo Atlantic-Congo Atlantic-Congo |
| ZM | Zambia | Eastern Africa | English | Indo-European |
| ZW | Zimbabwe | Eastern Africa | Chewa English Sesotho Shona Tswana | Atlantic-Congo Indo-European Atlantic-Congo Atlantic-Congo Atlantic-Congo |

CHAPTER 4

RESULTS AND DISCUSSION

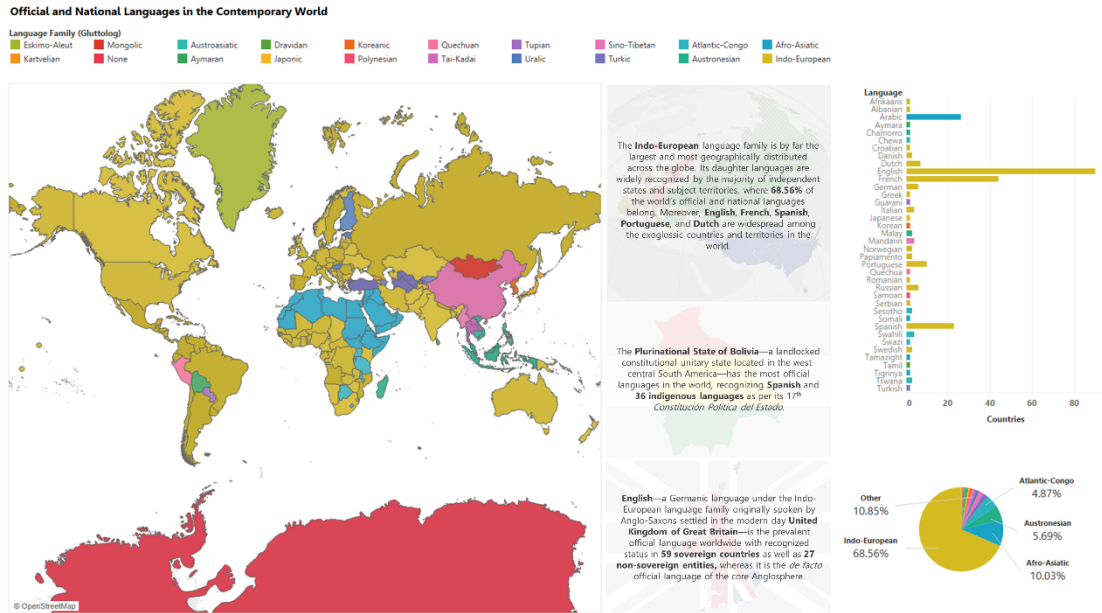


Figure 3 – Infographic

The figure above illustrates the most prominent official language and language family in the contemporary world. As shown by the infographic made with Tableau, the Indo-European language family is by far the largest and most geographically distributed across the globe. Its daughter languages are widely recognized by the majority of independent states and subject territories, where 68.56% of the world's official and national languages belong. In addition, English, French, Spanish, Portuguese, and Dutch are widespread among the exoglossic countries and territories in the world.

The Plurinational State of Bolivia—a landlocked constitutional unitary state located in west-central South America—has the most official languages in the world, recognizing Spanish and 36 indigenous languages including the extinct ones as per its 17th *Constitución Política del Estado*.

English—a Germanic language under the Indo-European language family originally spoken by Anglo-Saxons settled in the modern-day United Kingdom of Great Britain—is the prevalent official language worldwide with recognized status in 59

sovereign countries as well as 27 non-sovereign entities, whereas it is the *de facto* official language of the core Anglosphere.

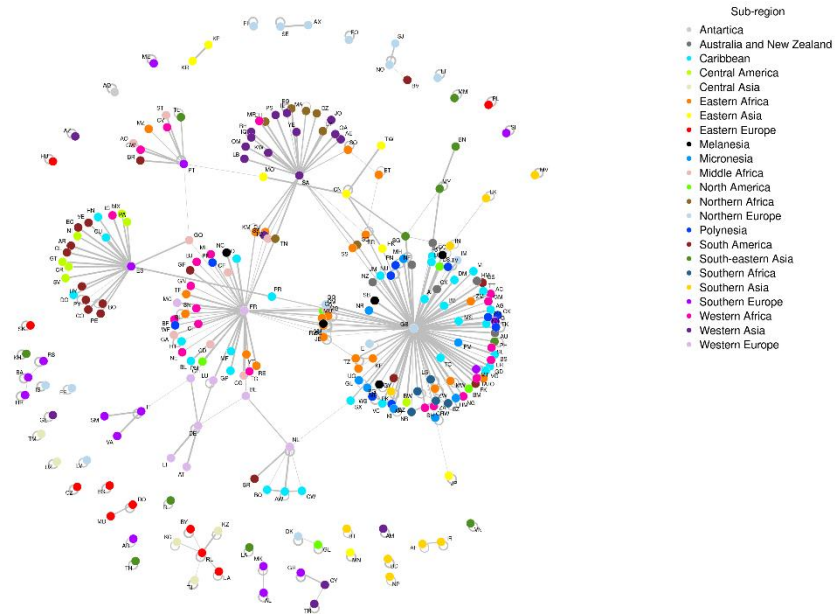


Figure 4 – Official and National Language Network

The undirected network graph above is generated with a Fruchterman-Reingold layout. The nodes represent the independent countries and non-sovereign entities, whereas the color of the nodes signifies their designated sub-region. The undirected ties or edges were associated with the co-occurrence of the official and national language of a certain country or territory to the origin country of said language, whereas their weight is determined by how many speakers in the populace use the language. We can observe in Figure 4 that most vertices are clustered towards the nodes from which their official language stems. On the other hand, several vertices are isolated from the rest of the network. This exhibits the stark difference between endoglossic and exoglossic states. Moreover, the outer nodes of each cluster with multiple ties are multilingual entities, while nodes with loops that have no other ties are monolingual entities. The thickness

of edges denotes the proportion of the given country's population that is literate in a particular official and national language.

Table 3 – Network Centrality

| Country | Sub-region | Language | Degree | Closeness | Betweenness |
|----------------|-------------------|-----------------|---------------|------------------|--------------------|
| United Kingdom | Northern Europe | English | 180 | 0 | 26176.148 |
| France | Western Europe | French | 90 | 0 | 16390.334 |
| Saudi Arabia | Western Asia | Arabic | 52 | 0 | 6957.558 |
| Spain | Southern Europe | Spanish | 42 | 0 | 7095.426 |

According to the table above, English, French, Arabic, and Spanish are the most prominent official languages in the world in terms of their centrality. There is no closeness centrality measurement on all nodes. The aforementioned languages are chosen for generating ego networks as shown below:

In the community detection visualization shown in Figure 5, we can observe the language origin communities present in the social network. We can see here in the community visualization the dominance of the top 4 languages in the contemporary world being the English, French, Arabic, and Spanish language.

In Figures 7-10, we can observe the respective ego networks of the top 4 nodes in the network. The top 1 in the English language ego network is the most dominant language in the contemporary world. Followed by the French language ego network which is spoken mostly in the countries of Sub-Saharan Africa. Followed again by the Arabic language ego network which is spoken dominantly in the Arabian Peninsula, Northern Africa, and East Africa. The top 3 languages in the network are part of the Indo-European language family, the most dominant language family in the contemporary world.

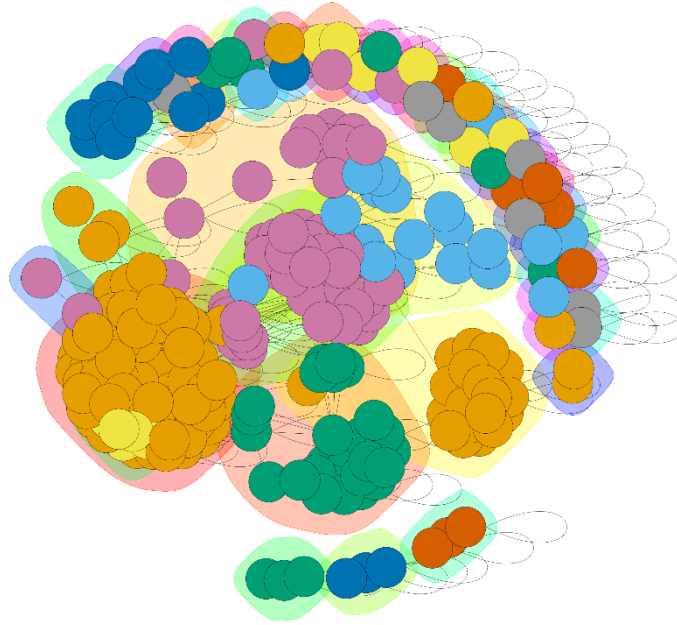


Figure 5 – *Louvain Detection Algorithm Community Graph*

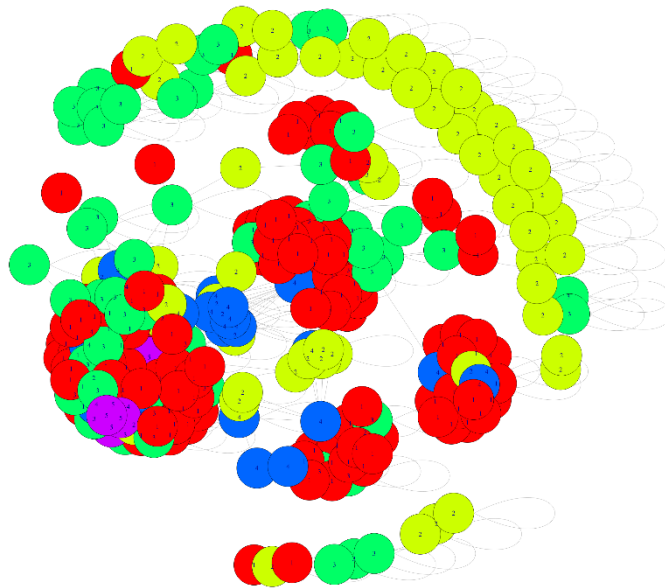


Figure 6 – *k-Core 1-5 Structure Graph*

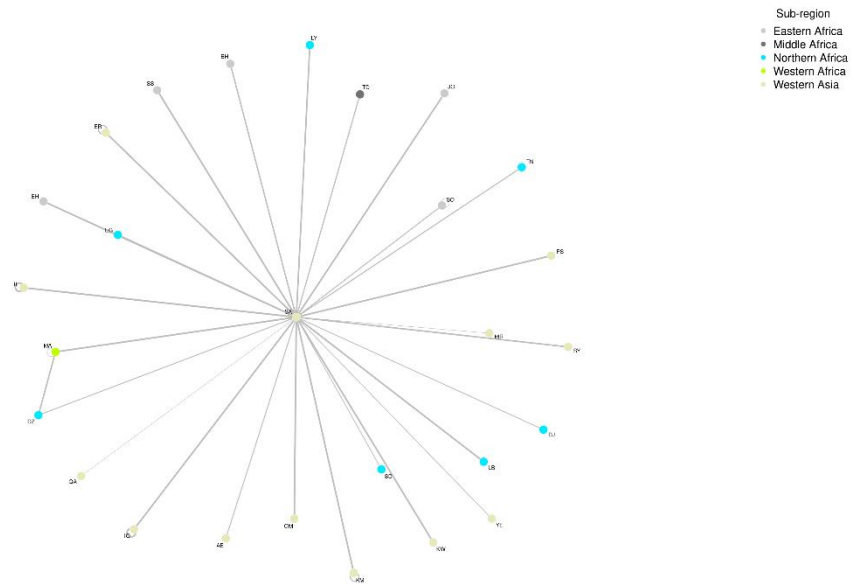


Figure 9 – Arabic Ego Graph

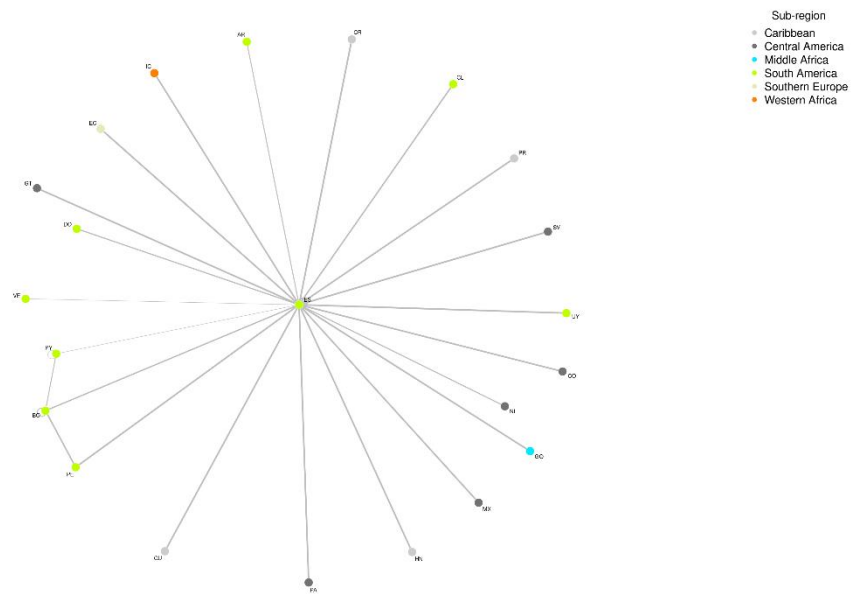


Figure 10 – Spanish Ego Graph

CHAPTER 5

SUMMARY, CONCLUSION, AND RECOMMENDATION

5.1 Summary

In the previous chapters, we have performed Social Network Analysis on our Official and National languages in the contemporary world network dataset. The results of our analysis returned that countries who used their colonial influence to spread their language have resulted in their dominance in the contemporary world. For instance: the English empire led by the British monarch dominated the contemporary world because they have deeply entrenched their culture and their language in countries that have become an economic powerhouse after their independence.

5.2 Conclusion

The Imperial colonialism of the Western empires has made their language an international tool for communication. The British empire for example has forced locals in areas they have occupied around the world to use their language for them to properly communicate with their oppressors [17, 19]. Due to their colonial expansion and the economic boom of the previous territories they occupied. The territories that have gained independence chose to retain and use the language taught by their oppressors as their official language. Open-minded post-colonialists believe that cultural power and exchange are connected to language and that language will be the one that will determine which is superior on both sides [19, 9]. Colonists actively reshape the educational systems of the countries they've colonized to suit their needs. One of the main reasons why colonists change the educational system and practices of the country they occupy is to instill their morality and their beliefs to their colonial subjects, allowing them to exploit their subjects for economic expansion purposes such as forcing them into manual labor [9]. The educational reform instilled by the colonizers during their occupation is still prevalent up to this day, as educational institutions measure the academic proficiency and excellence of their students using European languages as

metrics. In other parts of the world, European languages such as French and English are obligatory subjects in the basic education curriculum [9].

5.3 Recommendation

The number of countries with foreign languages, particularly European, as their official languages is alarmingly large. This is due to the fact that a lot of countries have been colonized by Western Empires [1]. Official language refers to a language used by government officials and bureaucrats to conduct official businesses or judicial practices. Whereas, a national language refers to the language shared by commoners [3]. The terms sometimes overlap with each other confusing which is which. One can say that this may be one of the reasons why in certain countries, the official language and the national language differ from one another [3]. The educational sector can significantly strengthen and promote the national language for the future generation [1, 9]. In this light, the following recommendations are submitted:

- Further, improve the usage of the national language in official government businesses.
- Strengthen the foundation of national language in the educational curriculum.
- Further study on applying or using national language in judicial, business, and education settings.

APPENDIX

R Shiny Web Application Dashboard: <https://frobbyxyz.shinyapps.io/offlang/>

REFERENCES

- [1] Carter, B. & Sealey, A. 2007. Languages, Nations, and Identities. *Methodological Innovations Online* 2, 2. DOI: <https://dx.doi.org/10.4256/mio.2007.0009>
- [2] Caviedes, A. 2003. The Role of Language in Nation-Building within the European Union. *Dialectical Anthropology* 27, 3. 249-268. DOI: <https://dx.doi.org/10.1023/B:DIAL.00000006105.16609.f5>
- [3] Choudhry, S. & Houlihan, E.C. Official Language Designation. *International IDEA Constitution-Building Primer* 20. International Institute for Democracy and Electoral Assistance, Stockholm, Sweden. DOI: <https://dx.doi.org/10.31752/idea.2021.40>
- [4] David, M.K., Dumanig, & F.P., Manan, S.A. 2017. National Languages - Medium of Instruction - Empowerment or Disempowerment? *Social Media and Language Teaching*, (2017)
- [5] Haugen, E. 1966. Dialect, Language, Nation. *American Anthropologist New Series*, 68, 4 (1966). 922-935. <http://www.jstor.org/stable/670407>
- [6] Hickey, R. *Language and Society*
- [7] Hobsbawm, E. 1996. Language, Culture, and National Identity. *Social Research* 63, 4 (1996). 1065-1080. <https://www.jstor.org/stable/40971324>
- [8] King, L. 2018. The Impact of Multilingualism on Global Education and Language Learning. *Cambridge Assessment English Perspectives*. University of Cambridge Local Examinations Syndicate, Cambridge, England.
- [9] Migge, B. & Léglise, I. 2007. Language and Colonialism. In *Language and Communication: Diversity and Change. Handbook of Applied Linguistics*. 297-338.
- [10] Ndukwe, J.I. 2015. The Question of a National Language in National Development. *IOSR Journal of Humanities and Social Science*, 20, 10, (2015). 75-79. DOI: <http://dx.doi.org/10.9790/0837-201067579>
- [11] Rabiah, S. 2012. Language as a Tool for Communication and Cultural Reality Discloser. In *International Conference on Media, Communication, and Culture* (2012). DOI: <https://dx.doi.org/10.31227/osf.io/nw94m>
- [12] Ridwan, M. 2018. National and Official Language: The Long Journey of Indonesian Language. *Budapest International Research and Critics Institute-Journal*, 1, 2 (2018). 72-78. DOI: <https://dx.doi.org/10.33258/birci.v1i2.14>
- [13] Shakib, M.K. 2011. The Position of Language in Development of Colonization. *Journal of Languages and Culture* 2, 7 (2011). 117-123. DOI: <https://dx.doi.org/10.5897/JLC.9000028>
- [14] Ward, R. 2019. National and Official Languages Across the Independent Asia-Pacific. *Journal of Multidisciplinary International Studies*, 16, ½ (2019). DOI: <http://dx.doi.org/10.5130/portalv16i1/2.6510>
- [15] Rao, P.S. 2019. The Role of English as a Global Language. Vol-4, Issue-1, (2019). 65-79. Retrieved from:

- [https://www.rjoe.org.in/Files/vol4issue1/new/OK%20RJOE-Srinu%20sir\(65-79\).pdf](https://www.rjoe.org.in/Files/vol4issue1/new/OK%20RJOE-Srinu%20sir(65-79).pdf)
- [16] Nye, M.J. 2016. Speaking in Tongues Science's centuries-long hunt for a common language. Retrieved from:
<https://www.sciencehistory.org/distillations/magazine/speaking-in-tongues>
 - [17] Dollinger, S. 2019. Creating Canadian English: the Professor, the Mountaineer, and a National Variety of English. Retrieved from:
<https://www.academia.edu/35184221>
 - [18] Wang, W. 2016. "Chinese English in as lingua franca in a global business setting". Web of Conferences: 25. Retrieved from:
https://www.shsconferences.org/articles/shsconf/pdf/2016/03/shsconf_icitce2016_01013.pdf
 - [19] Conrad, A. 2017. The Linguistic Colonialism of English. Retrieved from:
<https://brownpoliticalreview.org/2017/04/linguistic-colonialism-english/>
 - [20] Plonski, P., Teferra, A., Brady, R., 2013. Why Are More African Countries Adopting English as an Official Language? Retrieved from:
<https://www.booksforafrica.org/assets/documents/2013-ASA-Conference---English-Language-in-Africa-PAPER.pdf>