Essays on Economics of Language and Education

A Dissertation Submitted in Partial Fulfillment of the Requirement for the Degree of Doctor of Philosophy in Economics

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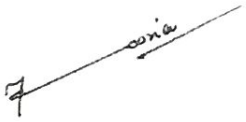
Signature: 

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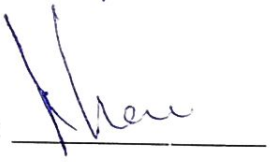
Signature: 

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Dedication

This work is dedicated to loving parents, siblings, and my husband,

Muhammad Tahir,

as well as my children, Eshaal Fatima, Hareem Zainab, and Muhammad Zohaan.

They have been my greatest source of inspiration, encouragement, and support through their constant prayers.

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Abstract

Essay 1 investigates the distributional impact of public spending in Pakistan, focusing on addressing inequality in distributing benefits to different income and language groups. The analysis was conducted in two stages, examining the impact of public spending on various education levels across income and language groups in Pakistan, including four provinces. The study found that low-income groups benefit more from primary education. In contrast, higher-income groups receive more benefits from secondary and higher education, and state spending favors the rich more than the poor. Higher education is regressive, while primary education spending is highly progressive. The second section of the analysis revealed that Punjabi language speakers with lower incomes enroll at a higher rate in higher education at public institutions due to greater sociocultural and linguistic barriers to education, resulting in disparities in enrolment rates among speakers of different languages. The benefit incident analysis's (BIA) findings suggest that increasing enrolment at all educational levels is essential for improving socioeconomic well-being. Improving the quality of instruction in public schools, particularly mother language instruction, could potentially reduce language barriers and increase enrolment rates and academic performance by fostering enhanced student comprehension and learning outcomes.

Essay 2 focuses on the concept of "Education for all – in whose language?" due to the lack of consideration for the linguistic environment of primary learners in Pakistan. The study analyzed data from multiple districts of Pakistan to determine the effects of language diversity on enrolment in primary education. Results showed a negative relationship between language diversity and enrolment rates. Early exposure to multiple languages, especially foreign language (English) instructions, decreases enrolment rates, while higher education levels exhibit a different enrollment trend. Policy formulation should acknowledge the importance of using the mother language in Pakistani primary education institutions to improve educational outcomes. The government should adopt an education policy based on a gradual transition from mother-language instruction (primary education) to foreign language (secondary/higher education) instruction.

Essay 3 highlighted the importance of linguistic diversity in economic considerations, as it impacts economic output. Research using a two-stage least square (2SLS) model examines the association between language diversity and economic productivity. While language diversity promotes economic productivity in the presence of

language diversity, primary, secondary, and higher education significantly promote economic growth. Native Language speakers educated in native languages (in addition to the national language) can contribute significantly to economic output. Implementing bilingual education programs and supporting local skilled workers can increase economic productivity. Policy experts should also consider creating jobs requiring proficiency in local languages.

Essay 4 examined the provision of education during British colonial rule in the subcontinent and the extent to which Pakistani educational policies adhere to colonial legacies. It found that Pakistan remains entangled in colonialism despite achieving independence. The education system is hindered by the influence of the ruling class and their interests, resulting in a concentration of opportunities among a small elite with English proficiency. Using a language other than the learner's primary language poses a significant obstacle to achieving high-quality education. Children are more likely to attain proficiency in a foreign language if they acquire literacy skills in their primary language beforehand. The friction between Urdu, English, and other regional languages calls for advocating for universal literacy in one's mother language. The Single National Curriculum (SNC) in Pakistan can eliminate the existing class-based education system and promote a fair and comprehensive educational atmosphere by implementing SNC in Urdu at all educational institutions, regardless of their public or private nature.

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List of Abbreviations

AERC	African Economic Research Consortium
BERA	British Educational Research Association
BIA	Benefit Incidence Analysis
BS	Bachelor of Science
CF	Control Function
ECE	Early Childhood Education
EDISC	Ethnic Discrimination
EEH	Education Enrollment at Higher Level
EEP	Education Enrollment Primary Level
EES	Education Enrollment Secondary Level
EET	Education Enrollment Total
EEX	Educational Expenditures
EFA	Education for All
ELF	Ethnolinguistic Fractionalization
ERIC	Education Resources Information Center
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HDI	Human Development Index
HEC	Higher Education Commission
HHI	Hirschman-Herfindahl Index
HIES	Household Integrated Economic Survey
HLCI	Herfindahl Linguistic Concentration Index
IV	Instrumental Variables
KP	Khyber Pakhtunkhwa
LC	Lorenz Curve
LEEX	Log of Educational Expenditures
LOI	Language of Instruction
MICS	Multiple Indicator Cluster Survey
MPI	Multidimensional Poverty Index
MS	Master of Science
NBER	National Bureau of Economic Research
NFC	National Finance Commission

OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
PB	Province Baluchistan
PBS	Pakistan Bureau of Statistic
PES	Pakistan Economic Survey
PGR	Population Growth Rate
PK	Province Khyber Pakhtunkhwa
PP	Province Punjab
PPP	Purchasing Power Parity
PS	Province Sindh
PSIA	Poverty and Social Impact Analysis
PSLM	Pakistan Social and Living Standards Measurement
SDGs	Sustainable Development Goals
SNC	Single National Curriculum
UIA	Utilization Incidence Analysis
UK	United Kingdom
UN	United Nation
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPOP	Urban population
USA	United States of America
VIND	Vulnerability to Poverty
WIDE	World Inequality Database on Education

Introduction, Motivation, and Literature Contribution

In the last decade, global policy discourse has placed considerable emphasis on education, particularly driven by UNESCO's objective to achieve "education for all" (EFA), the Sustainable Development Goal 4 (SDG-4) emphasizing "quality education," and SDG 10 calls for “reduced inequalities” as outlined in the 2030 Agenda. Within the context of this discourse, three fundamental questions have emerged, shaping the core focus of this research. Firstly, it is significant to understand the distribution of public spending in education, particularly concerning “who is getting what amount of benefit” across diverse characteristics of individuals and households. The examination of such analysis holds significant importance in nations characterized by substantial income inequality and diverse linguistic groups, as illustrated in the context of Pakistan in this study. Secondly, the imperative inquiry arises: "EFA, but in whose language?" The EFA cannot be achieved until research does not address the language of instruction in education. The achievement of universal education centers upon the strategic determination of language in education use across different educational levels, necessitating an empirical exploration of language's use in education. Lastly, inclusivity in language-based educational policies becomes a principal concern, which requires evaluating whether these policies align with established educational objectives in Pakistan and effectively cater to the linguistic needs of all stakeholders in the educational process.

This study is conducted, and the empirical results are presented and discussed in four independent essays to answer these questions. Pakistan is a nation characterized by linguistic diversity, with eighty-six languages spoken. Among these languages, Punjabi is the predominant mode of communication, utilized by 38.78 percent of the population. The linguistic diversity encompasses a range of languages, including Urdu, Sindhi, Pushto, Balochi, Saraiki, Hindko, and Brahvi, representing substantial population segments. Moreover, Pakistan, a low-income economy that is also characterized by income inequality, a class-based education system, low enrollments, low public education spending, and particularly, not providing education according to stakeholder’s language preferences; hence, it is justified to answer and conduct research on the questions outlined earlier.

In this context, public spending allocation is analyzed in Pakistan, including all its provinces, especially in reaching those with diverse income levels and language

preferences. This research presented the distribution of public educational spending among various linguistic and income groups, as different linguistic groups have distinct educational goals and preferences regarding resource allocation. Moreover, this study's significance lies in its comprehensive exploration of public education spending dynamics and in addressing a critical gap in empirical literature related to language diversity and its impact on educational outcomes in Pakistan. Despite the evident distress induced by instructing children in languages they do not fully comprehend, Pakistani public schools have continued this practice, which impacted cognitive skill acquisition, particularly in the early years of schooling. This research's empirical results, based on household surveys and census data from Pakistan, bridge this gap by offering empirical evidence on the consequences of this language disparity, shed light on the complexities of literacy development within a multilingual educational framework in the early years of schooling and bilingual education at higher education.

Moreover, this research investigated the economic implications of linguistic diversity that have been previously disregarded in the Pakistani context. This study investigates previously unexplored areas by thoroughly examining the relationship between language diversity and economic productivity at the district level. It emphasizes the significant influence of language on shaping economic outcomes in a diverse society, Pakistan. Moreover, this study adopts a critical perspective towards language in education policies in Pakistan by examining historical language in education policies. This study utilizes advanced qualitative analysis techniques, such as Leximancer, to thoroughly examine the impacts of language in education policy in making a class-based education system. This study uncovers the fundamental themes and concepts that shape these policies, offering a comprehension of their overall coherence.

Literature Contribution- Essay 1

According to the 2030 Agenda's SDGs, burgeoning interest in EFA has led over the past ten years. This resurgence has encouraged the return of incidence analysis, especially when determining how public spending benefits people and households. In countries with high-income inequality, such as Pakistan, it is more crucial because it does not only matter the amount of public spending but also the efficiency it is directed toward those with low incomes, which is studied in this research. Moreover, Pakistan represents a high degree of linguistic diversity, with eighty-six languages being spoken within its borders. According

to demographic data, Punjabi is the predominant language spoken in Pakistan, with 38.78 percent of the population utilizing it as their primary means of communication. Urdu is spoken by 7.08 percent of the population, followed by Sindhi at 14.57 percent, Pushto at 18.24 percent, Balochi at 3.02 percent, Saraiki at 12.19 percent, Hindko at 2.44 percent, and Brahvi at 1.24 percent. Hence, this research has contributed to estimating the allocation of public spending on education among diverse language and income cohorts, as distinct linguistic groups exhibit diverse educational objectives and spending preferences. This research is first in its methodology and findings, which presented the empirical evidence and contributed to the existing empirical literature describing the "Benefit incidence analysis" of public spending on education across various income groups in Pakistan. Furthermore, this study contributed to the literature by examining the benefits accrued resulting from the provision of public education across diverse language groups.

Literature Contribution- Essay 2

It is essential to recognize that providing education in a language that a child does not understand can cause them psychological distress. In Pakistan's multilingual environment, the instruction medium in schools is not the children's mother language, which remains the practice in Pakistani public schools despite research indicating that children acquire cognitive skills more effectively in their mother language, particularly in their early years of schooling. Although the descriptive debate continues this gap, the empirical literature is silent in presenting evidence. Hence, using household surveys and census data in Pakistan, this research recognized the importance of bringing empirical evidence and scientifically contributed to examining the consequences of assuming a student learns a new language and simultaneously grounding literacy development with other skills based on a foreign language, which is irrational and contrasts with the accepted learning principles; this is what this research has estimated using household survey data.

Literature Contribution- Essay 3

Linguistic heterogeneity significantly influences economic decision-making in the public sphere in linguistically fragmented societies; however, the question still needs an investigation in Pakistan. Systematically, the significance of linguistic diversity remained unnoticed from an economic point of view in Pakistan. Therefore, recognizing the importance of Pakistan's economic productivity determination at a district level, this research has contributed to the empirical literature by bringing empirical association

between language diversity and economic productivity in Pakistan. The current study has addressed this research gap and demonstrated the significance of incorporating the role of language heterogeneity in determining economic outcomes in Pakistan.

Literature Contribution- Essay 4

UNESCO (1953) stated that a child's native language is the optimal teaching medium. The language of instructions is the fundamental question addressed and answered from an economic point of view in current research. Moreover, this study has addressed the educational socioeconomic divide among various social groups in Pakistan. This study has contributed to the literature by considering various language policies in education adopted in the past and critically analyzing the economic/political factors behind adopting these policies. In addition, the researcher has contributed to finding the critical economic/political interests of the different groups associated with language planning policies in education. Novel thematic analysis is utilized for the first time in this kind of analysis and found how these language policies contributed to the (un)equal access to education opportunities for various income and language groups in Pakistan, using qualitative data analysis software, i.e., Leximancer. Leximancer produced concept maps visually representing the primary themes and concepts extracted from the education policies and examined the concept maps to identify the occurring themes, which identify clusters of interconnected concepts to comprehend the fundamental concepts present in those policies. This research then comprehended the coherence of education policies, which could offer valuable insights into the persistence of educational policy objectives and approaches.

The organization of the chapters in this study is structured to explore various dimensions of education and language policy in Pakistan, with each chapter focusing on a distinct theme that builds upon the previous one to offer a comprehensive analysis. Each chapter is structured as an independent essay, beginning with an introduction, and reviewing relevant theoretical and empirical literature, followed by a methodology section outlining the data sources and analytical techniques used in the research. Each chapter concludes with a discussion of findings, policy recommendations, and reflections on research limitations and future research directions. The chapters are organized as follows.

Chapter 1 investigates the distributional effects of public education spending across different income and language groups in Pakistan. It begins with introducing the topic,

providing the research background, and identifying gaps in the existing literature. The chapter then reviews theoretical and empirical literature to establish a foundation for the study. The methodology section follows data sources, variables used, and the estimation techniques applied to explore the distributional impacts of public education spending. The chapter concludes with a discussion of the findings, highlighting the disparities in education spending across various groups and offering some policy recommendations to improve public education equity.

Chapter 2 investigates the impact of language diversity on educational attainment in Pakistan, filling gaps in the research and reviewing theoretical frameworks and empirical investigations. The methodology section describes the data collection methods and estimation approaches used to analyze language diversity's impact on educational outcomes. The chapter concludes with a review of the findings and policy recommendations for improving educational success in linguistically diverse contexts.

Chapter 3 explores the impact of language diversity on economic productivity in Pakistan, particularly emphasizing the relationship between language diversity and economic performance. The methodology section describes the data sources and analysis methods used to investigate this impact. The findings shed light on the relationship between language variety and economic productivity and policy recommendations for using language diversity to boost economic growth.

Chapter 4 examines the economic implications of Pakistan's language-in-education policies in a multilingual society. It examines the socioeconomic consequences and challenges of language planning and policy execution in Pakistan, including how existing policies affect numerous economic and social issues. The chapter concludes with policy implications for making language-in-education programs more inclusive and economically advantageous.

Chapter 1

1 Essay 1: Measuring the Distributional Effects of Public Spending in the Education Sector across Income and Language Groups in Pakistan

Abstract

Essay 1 examined the distributional impact of public spending on education in Pakistan, addressing inequality associated with distributing benefits of public educational spending to various income and language groups. This study utilized the benefit incidence analysis (BIA) using cross-sectional data for Pakistan, including four provinces' public education spending. The analysis was conducted in two stages. First, the benefit incidence of public spending on education across various incomes is analyzed. In contrast, second, BIA across various language groups (Urdu, Punjabi, Sindhi, Pushto, Balochi, Saraiki, Hindko, Brahvi, and Others) among income deciles at different levels of education, i.e., primary, secondary, higher level of education are analyzed. A substantial diversity in public spending on education is observed in benefits accrued at different educational levels, income deciles, and language groups, which concluded that higher education is regressive, whereas spending on primary education is highly progressive. Four Pakistani provinces exhibit the same pattern: Punjab, KP, Sindh, and Baluchistan. The second section of the BIA analysis revealed that in Pakistan, Punjabi language speakers with lower incomes enrolled at a higher rate than speakers of other languages in primary, secondary, and higher education at public institutions. Overall, the enrollment ratio in public schools is low, which leads to lower benefits of public education spending on education accrued to specific groups. According to the BIA's findings, increasing enrollment at all educational levels is essential to improve socioeconomic well-being. Therefore, improving the quality of instruction in public schools, particularly mother language instruction, could potentially reduce the language barrier and increase enrollment rates and academic performance by fostering enhanced student comprehension and learning outcomes. Moreover, increased public education spending and enhanced efficiency are required to remove the educational inequalities among income and language groups in Pakistan.

Keywords: Public Spending on Education; Mother Language; Resource Distribution; Benefit Incident Analysis; Income groups; Language Groups

1.1 Introduction and Research Background

Since the world has adopted the Agenda for Sustainable Development, the core 17 Sustainable Development Goals (SDGs), i.e., the global goals with 169 related targets, are at the heart core of the policy agenda of every nation (Gannon et al., 2022). The SDGs aimed to "count the uncounted" by including all the people in opportunities with "no one left behind" in terms of education and bringing prosperity for everyone (Ugwoji, 2022). Global socio-economic indicators demonstrated various disparities associated with income and spending on education (Sibanda, 2023). The objective is to address these inequalities and develop sustainable solutions to various socio-economic problems (Pučėtaitė et al., 2019).

In 2002, the United Nations (UN) designated the 2005-2014 decade as the UN Decade of Education for Sustainable Development (SD). Therefore, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has been assigned to promote education-related objectives worldwide. UNESCO (2003) aims to instruct various economies on the issue of how to integrate their global objectives into their education policies, strategies, and programs (UNESCO, 2003). The resolution of education for SD has the primary mission of integrating specific SDGs into the policy framework at every level and type of education, including the provision of training and school curriculum, which are expected to act as agents of change (Barth, 2014; Frisk & Larson, 2011).

Recent statistics by UNESCO revealed that an estimated 244 million children aged between 6 and 18 are still out of school worldwide. Sub-Saharan Africa and Central and Southern Asia have the highest out-of-school learners. The challenge of addressing inequalities in the educational provision at various levels of education is the ongoing prime debate, which intends to address the potentially significant negative consequences of income and education spending for human well-being. Subsequently, the SDGs framework encourages social inclusion, and everyone might work together to build a sustainable society. However, a sustainable society requires that every individual learn how to understand the complex world in which they live, deal with the rapid pace of social change, and act positively on these changes. Consequently, UNESCO intended to integrate

education with modified policy frameworks to mitigate the emerging challenges in the field (Günther et al., 2022).

"Equitable education for all" is a fundamental human right. Education is a critical prerequisite for well-being, productivity, and socio-economic development. This prerequisite necessitates equal access to education for all without considering gender, ethnicity, language, or religion, i.e., the factors that the individuals do not control (UNESCO, 2014). Equity[1] in education has been placed at the center of discussion in the international development agenda with the adoption of the "Education 2030 Framework" and "Sustainable Development Goals (SDGs)." In the education domain, SDG 4 states:

"To ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations, 2015).

SDGs aim to provide equal access to all levels of education, eliminating gender disparities in education across all ethnic and income groups of the entire population. Furthermore, it intends to address all inequalities and exclusions in accessing education opportunities from the beginning to the entire education span. Education is an essential dimension of human well-being and is considered the ultimate yardstick to achieve socio-economic development as it enhances individuals' efficiency and productivity by equipping individuals with skills and Capabilities (McMahon, 2009; Zaman, 2008), which in turn, facilitates to improve individual's socioeconomic well-being (Anlimachie & Avoada, 2020). Moreover, education brings economic development and eradicates societal inequalities; however, equitable education is the prerequisite for collective welfare (UNESCO, 2014).

As far as educational provision is concerned, it depends on educational spending, which is the most strategic way to cultivate the human capacity to overcome socioeconomic problems. It enables individuals to participate in the development process at the national level effectively and empowers people to improve their collective well-being (Nafula, 2002). Educational spending is the number of resources relinquished for specific value gain, i.e., improvement in educational indicators. Value gain, moreover, can be defined as

[1] The word equality is defined as "the state or quality of being equal; correspondence in quantity, degree, value, rank, or ability." Equity recognizes that each person has different circumstances and allocates the exact resources and opportunities needed to reach an equal outcome.

the "outcomes per money income spent (Baumfield & Mattick, 2016). Thus, it is indispensable to understand the intended outcomes of educational spending because researchers argue that returns to education spending are associated with higher incomes and low poverty rates (Barro, 2002; Becker, 1975). However, Chabbott and Ramirez (2000) demonstrated that unfavorable economic circumstances could be controlled only by providing all people with education, better skills, and the means to utilize those skills productively (OECD, 2015).

Perspectives on educational spending emerged with various views, i.e., who spends what number of resources, i.e., state or market? And fairness in the distribution of benefits of educational spending across various income and ethnic groups. In economies where educational provision is the *state's responsibility*, a rapid spread in educational outcomes is observed. This rise is accompanied by the public provision of education rather than the market (Dreze & Sen, 2003). However, the rate of increase in educational outcomes is different among emerging and developed nations. These differences are attributed to a fair distribution of education spending, i.e., irrespective of an individual's ethnicity and income class (Berne & Stiefel, 1984; Meredith & Underwood, 1995)

Investigating education costs contemplated that they vary across education levels in emerging and developed countries. Every nation requires a minimum threshold level of resources to spend on education. However, the exact minimum number of resources has proved challenging to estimate. Therefore, average educational spending is the benchmark for minimum spending on education (Vegas & Coffin, 2015). Educational outcomes are sometimes associated with increased education spending for countries if they spend below this threshold. In contrast, higher educational outcomes for countries that spend above this threshold are associated with increased spending efficiency. Moreover, Glewwe et al. (2011) concluded that a few primary inputs significantly affect educational attainment in emerging nations. Krishnaratne and White (2013) investigated the effects on educational outcomes for better infrastructure building, educational materials, and additional teaching resources and established a positive relationship among the same (Fuller and Clarke, 1994).

Insofar as the association between educational spending and educational outcomes is concerned, comprehensive studies found a relatively strong and systematic connection between educational spending and educational outcomes (Hanushek, 1986; Miningou et al., 2022; Yang & Lee, 2022). In contrast, some empirical evidence endorsed a weak

association between educational resources and outcomes (Calarco, 2011; Hedges et al., 1994; Kang, 2022). However, none of this evidence suggests an unrestricted increase in education spending. Later, Hanushek (1994) admitted that money matters only at times and accepted that “throwing money” at schools is not the best practice without addressing the question of distributional justice (Hedges et al., 1994)

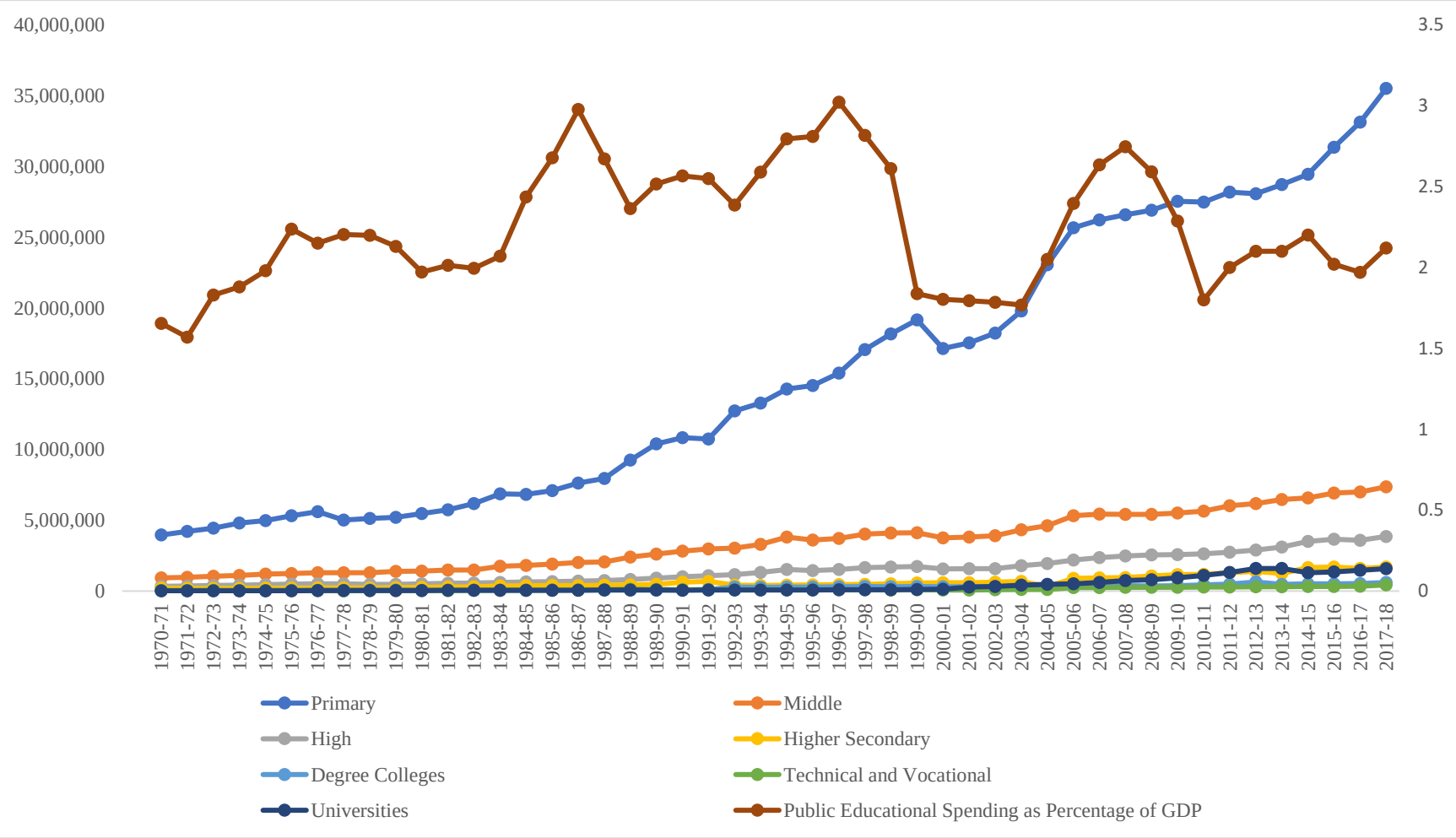
Describing the optimal level of education spending determining the highest educational outcomes is concerned; the distributional efficiency of this public spending is debated rather than the amount of resources spent on education. Therefore, few studies argued that educational spending does not effectively contribute to outcomes if the distribution question is ignored (Condron & Roscigno, 2003; Di Gioacchino et al., 2019). Furthermore, the debate emerged that zero educational spending is unjustified and that too much spending does not systematically improve educational outcomes. Therefore, efficiently raising education spending until a certain threshold is reached to provide adequate resources for optimum educational outcomes is necessary.

As previously discussed, the comprehensive studies exacerbate that an unconditional increase in education spending does not lead to the desired outcomes; however, incorporating distributional efficiency of public spending on education is indispensable for better educational outcomes. Literature supports this research's objective that *"how money is spent" and "who is getting the ultimate benefit"* is more important than *"how much money is spent."* Pritchett and Filmer (1999) explain this dual focus: an educational institution can increase efficiency and produce higher educational outcomes with less funding, but if two schools have the same efficiency in allocation, the educational institution with the higher budget will outperform the educational institution with the lower budget (Ferraro et al., 2021; Glewwe & Kremer, 2006). The *benefit* in the *"who is getting the ultimate benefit"* question can be viewed from multiple stakeholder perspectives (Maloney et al., 2017) because the global push to expand primary and secondary education originated with human capital theory (Becker & Lewis, 1993; Schultz, 1961). Furthermore, it assumes that the expansion of formal education profoundly deteriorates economic and social inequalities. Birdsall et al. (1995) and Mingat (1998) indicated that the high-achieving East and Southeast Asian economies are examples of countries that experienced rapid economic growth and a dramatic decline in poverty because of the expansion of formal education compared with other factors. Morris (1996) stated two most significant features of high-achieving East and Southeast Asian economies concerning formal

education. First, the accrued benefits for primary education, and second, the timely expansion of secondary schooling were nearly equal for everyone. Many other emerging countries viewed the model as a template for replication. Consequently, these countries allocated considerable financial resources to universalize primary schooling and expand secondary schooling to duplicate the outcomes experienced by the high-achieving economies.

From an emerging economy perspective, for instance, in Pakistan, educational provision is the state's constitutional responsibility (Heymann et al., 2014). In Pakistan, public spending on education lies on the fringes of 2 percent of the GDP. Thus, since 1972, public spending on education as a percentage of GDP has decreased or remained stagnant. However, the data does not support the empirical justification of the argument that "educational Provision is the state's constitutional responsibility," as demonstrated in Figure 1-1. Furthermore, historical trends in education enrollments by education level, i.e., primary, middle, high, higher secondary, Vocational, and University, have a rising trend. Moreover, among this rising enrolment, primary level enrolments are increasing more speedily than other levels of education.

From 1970 to 2018, Figure 1-1 illustrates the critical trend in gross enrolment in education across various languages and public spending on education in Pakistan. The y-axis of Figure 1 illustrates the various levels of enrolment in education. Over time, enrolment in every level of education has exhibited an upward trend. First, enrolment in primary education (1 to 5 years of education) has increased dramatically relative to enrolment in other levels of education. In primary enrolment, the level for 1999-2000 represents a slight decline from 19147666 to 17135741 enrollments. Primary education enrollment increased from 3960000 in 1971 to 15505598 in 2018, representing a significant upward trend. Middle-level enrolment (6 to 8 years of education) is the second highest level of education, with a rising trend over time. Middle school enrolment was 2,000,000 in 1971, and 736,135, as of 2018, is reported. All other educational enrolments, including secondary, higher college education, and higher university enrolments, as well as technical and vocational education enrolments, are increasing over time. On the second Y-axis, public spending on education demonstrates a random behavior without an upward trend over time. The highest level of public education spending, 3.02 percent of GDP, was recorded in 1996-97, while the lowest level, 1.7 percent, was recorded in 2004. However, the average educational spending over time has been around 2.2 percent of GDP.

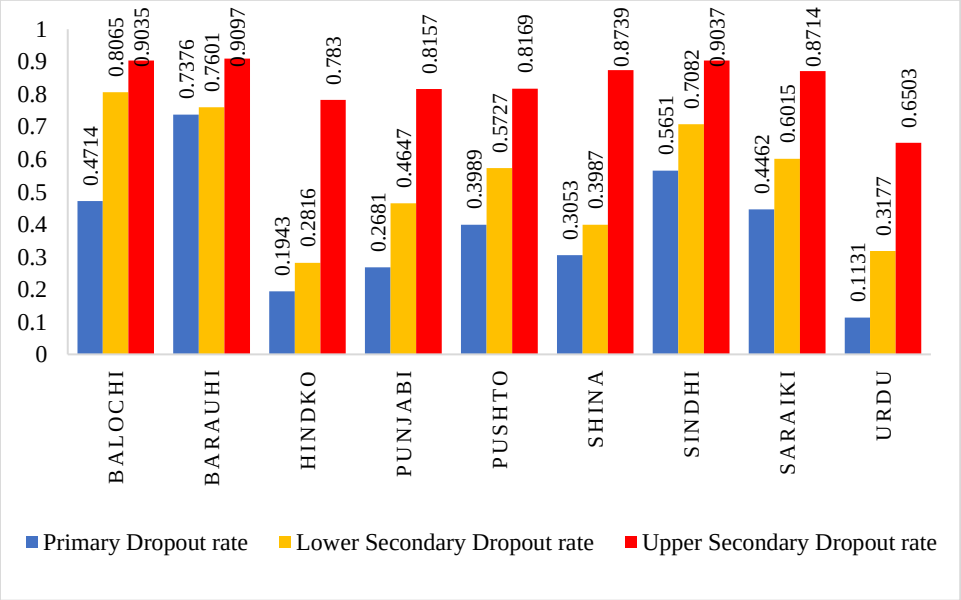


Source: Pakistan Educational Statistics 2018-19 and World Development Indicators, 2020

Figure 1-1: Key Trends in Education Enrolment and Public Spending on Education

Pakistan has a low literacy rate, even among the countries with comparable resources and socio-economic situations. Pakistan has an adult literacy rate of 62.8 percent, of which males share 73.4 percent, and females share 51.9 percent (PES 2022). As depicted in Figure 1-1, less than 3 percent of Pakistan's resources have been allocated to the educational sector; consequently, it can be inferred that the education sector is suffering from a lack of financial resources over time compared to other developing nations in the region that spend a more significant proportion of their resources on education (Ahmed et al., 2022; Chowdhury & Chowdhury, 2023). A subsequent question of the distribution of resources in the education sector, i.e., the efficient distribution of public spending on education, also requires additional investigation. Moreover, Figure 1-1 illustrates the enrolment disparities between various levels of education. Enrolment in the primary level of education demonstrated an upward trend with a rising rate over time, while enrolment in secondary education followed a similar pattern in the middle of the 1980s. Higher secondary, technical, vocational, degree colleges, and technical education enrolments are increasing much slower.

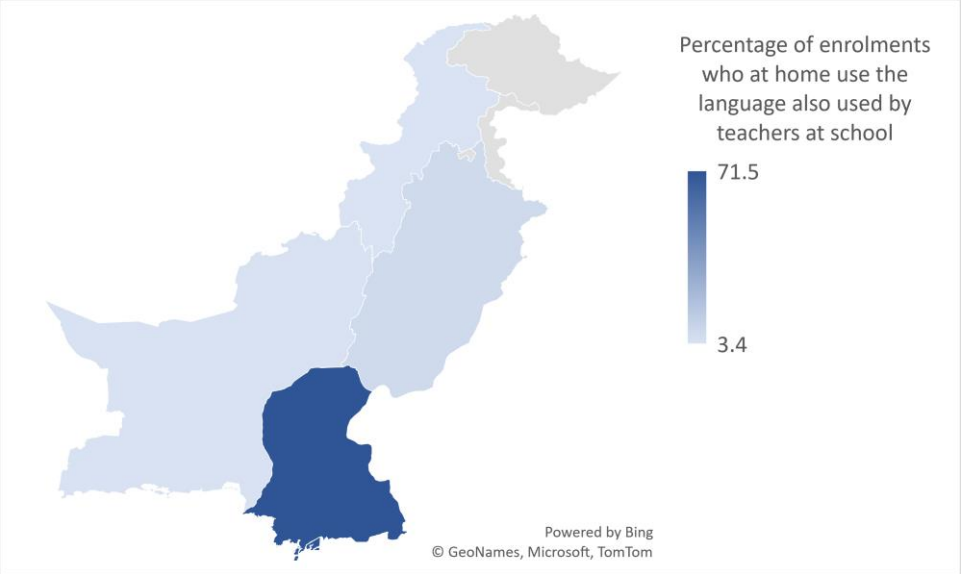
Insofar as the distribution of educational resources is concerned, such as *"who is getting what amount of resources,"* linguistic and income diversity is indispensable to contemplate. Figure 1-2 describes the dropout ratios across various education levels and language groups.



Source: UNESCO's World Inequality Database on Education 2019

Figure 1-2 Percentage Distribution of Dropouts by Language Groups and Education Level

Figure 1-2 explains the education dropout rate of different language speakers in Pakistan in 2019, including Urdu, Saraiki, Sindhi, Shina, Pushto, Punjabi, Hindko, Barauhi, and Balochi. In upper secondary education, the Barauhi have the highest dropout rate, followed by Sindhi, Balochi, Shina, Saraiki, Pushto, and Punjabi, in that order. Lower secondary dropout rates are ordered from higher to lower, ranging from 50 to 80 percent for Balochi, Barauhi, Sindhi, and Saraiki speakers. Sindhi, Balochi, and Saraiki language speakers have the highest rates of primary education dropout compared to other language speakers. Urdu speakers, on the other hand, have a lower dropout rate than other language-based enrolments.



Source: Author's Construction using MICS data 2019

Figure 1-3 Percentage Distribution of Children Who at Home Use The Language Also Used By Teachers At School

Figure 1-3 presented the basis for this research, which is also supported by the evidence that if students do not share the same medium of instruction as the mother language spoken at home, the dropouts continue to rise (UNESCO, 2003). Figure 1-3 demonstrates the percentage of individuals speaking the same language at home as the language of instruction used in schools across different provinces in Pakistan. Furthermore, the instruction mode provided at schools significantly hinders dropout ratios (Asif et al., 2021).

1.1.1 Research Gap and Literature Contribution

According to the 2030 Agenda's SDGs, burgeoning interest in "education for all" has led over the past ten years. However, the value of educational opportunities as a

component of human capital is recognized. This resurgence has encouraged the return of incidence analysis, especially when determining how public spending benefits people and households. Ricardo (1822) examined the incidence of the taxes levied by the Corn Laws, although tax incidence analysis in economics has a long history (Kotlikoff & Summers, 1987; Mieszkowski, 1969). Nonetheless, Selowsky (1979b) and (Meerman, 1979a) transformed the study of benefit incidence, while distributional analysis of the advantages of public spending and policy, in general, is more recent (Younger, 2003a, 2003b).

The standard Benefit Incidence Analysis (BIA) is frequently used to infer the distributional effects of public spending by primarily describing who currently benefits from specific public spending (Ajwad & Wodon, 2002; Davoodi et al., 2010; Demery & Gaddis, 2009; Kirama, 2021). In countries with high-income inequality, such as Pakistan, it is more crucial because it does not only matter the amount of public spending but also the efficiency with which it is directed toward those with low incomes. Several studies on the BIA of public spending on education across Pakistan's various income groups have been conducted previously (Asghar & Zahra, 2012; Hakro, 2007; Sabir & Abdullah, 2002). In addition, numerous studies on poverty and inequality have been conducted in the existing body of literature to provide in-depth knowledge on how public spending is directed at the health and education sectors to address inequality among different groups (Davoodi et al., 2010; Gafar, 2006; Kirama, 2021; Mitra, 2015).

Pakistan is a country in South Asia that boasts a high degree of linguistic diversity, with eighty-six languages being spoken within its borders. Among these languages, 78 are indigenous to the region, while the remaining eight are non-indigenous (Jabeen, 2020). According to demographic data, Punjabi is the predominant language spoken in Pakistan, with 38.78 percent of the population utilizing it as their primary means of communication. Urdu is spoken by 7.08 percent of the population, followed by Sindhi at 14.57 percent, Pushto at 18.24 percent, Balochi at 3.02 percent, Saraiki at 12.19 percent, Hindko at 2.44 percent, and Brahvi at 1.24 percent. Additionally, regional languages are spoken by a significant portion of the population. It is worth noting that there is a dearth of empirical evidence about allocating public spending for education among different linguistic groups in countries with linguistic diversity, such as Pakistan. A lack of empirical research has established the incidence of public spending on education across income groups; however, the incidence of public spending on education across various language groups has not been established globally or in Pakistan. In addition, there is no empirical evidence describing

the disparities in the distribution of public spending on education across various language groups in Pakistan.

As far as public spending in ethnically and linguistically diverse countries like Pakistan is concerned, it necessitates contemplating the provision of public education with the benefits accrued by different language groups. It is imperative to consider the allocation of public funds towards education among diverse language and income cohorts, as distinct linguistic groups exhibit disparate educational objectives and spending preferences. This study proposes to cover this research gap by bringing empirical evidence and contributing to the existing empirical literature describing the "Benefit incidence analysis" of public spending on education across various language speakers and income groups in Pakistan. Furthermore, this study contributes to the literature by examining the benefits accrued resulting from the provision of public education across diverse linguistic and income demographics.

1.1.2 Policy Relevance

The necessity of studying the BIA in Pakistan stems from the likelihood that both the overall progress and the distribution of progress were significantly more unfavorable to people experiencing poverty in Pakistan (Heyneman & Stern, 2014). Furthermore, the rise in inequality in Pakistan over the past two decades is a significant cause of low literacy. Consequently, the highly unequal income distribution exacerbated low literacy in Pakistan (Rehman et al., 2015). It implies that if it is not considered, all the public spending on reducing these inequalities among income and linguistic groups may exacerbate the gap between the poor and the rich and may not necessarily reduce education disparities in the country. Therefore, examining the benefit incidence of public spending in Pakistan is essential to maximize the "Education for all" in Pakistan.

The present study into the distributional consequences of public spending among different income and language cohorts is grounded in three main origins (Van de Walle, 2002). (Van de Walle, 2002). Initially, it is essential to note that due to market failures, households may encounter educational deprivation, leading to deprivation with distributional outcomes both with and without policy intervention—furthermore, the lack of alternative policy instruments. Within developed countries, the taxation system is an additional means of promoting educational equity through redistribution. In nations categorized as emerging, implementing comprehensive income taxes is often impractical,

resulting in a less efficient tax system in terms of fulfilling its objectives. The significance of public spending in the context of distribution assumes greater importance. Thirdly, the necessity of fiscal restraint for the government and the challenging trade-offs that it encounters. Providing certain public services, such as primary education, is significant to emerging nations, and the government plays a pivotal role in ensuring resource availability. Information about distributional effects can facilitate decision-making, specifically regarding the degree of benefit accrued by society's most social and poor segments. The sources above are an integral part of the public system in Pakistan. Therefore, it is imperative to scrutinize the distributional repercussions of public spending on education in Pakistan concerning various income and linguistic groups. It is imperative to scrutinize the impartiality of resource distribution vis-à-vis income and language groups to achieve more significant equity in allocating public educational resources across diverse demographic groups.

1.1.3 Research Objectives

This study's core objective is to determine the average benefits of public spending across various income and language groups in Pakistan. The specific research objectives are:

1. To develop empirical evidence addressing the inequality issues across various income groups in Pakistan's "Average Benefit" distribution of public spending in the education sector at primary, secondary, and higher education enrolment levels.
2. To bring Empirical evidence on the distributional impact of public spending in education by considering various language groups as beneficiaries of public spending at Pakistan's primary, secondary, and higher education enrolment levels.

1.1.4 Research Hypothesis

Based on the core objective of determining the average benefits of public spending across various income and language groups in Pakistan, the following hypotheses are constructed to test empirically.

Hypothesis 1: Public Spending on Educational Inequality Across Income Groups

Null Hypothesis 1 (H_0): Public spending on education is more beneficial to higher-income groups than lower-income groups in Pakistan.

Alternative Hypothesis 1 (H_A): Lower-income groups receive a larger share of the benefits from public education spending than higher-income groups in Pakistan.

This hypothesis identifies whether public spending on education is equally beneficial to different income groups or whether inequality exists in how the benefits are distributed. If a significant difference exists, it suggests that public spending may favor certain income groups over others, contributing to inequality. This hypothesis is further investigated through the following three hypotheses.

Hypothesis 1A:

H_0: Public spending on education at the primary education level is more beneficial to higher-income groups than lower-income groups.

H_A: Lower-income groups receive a larger share of the benefits from public education spending at the primary education level than higher-income groups.

Hypothesis 1B:

H_0: Public spending on education at the secondary education level is more beneficial to higher-income groups than lower-income groups.

H_A: Lower-income groups receive a larger share of the benefits from public education spending at the secondary education level than higher-income groups.

Hypothesis 1C:

H_0: Public spending on education at the higher education level is more beneficial to higher-income groups than lower-income groups.

H_A: Lower-income groups receive a larger share of the benefits from public education spending at the higher education level than higher-income groups.

Hypothesis 2: Distributional Impact of Public Spending on Education Across Language Groups

Null Hypothesis (H_0): Public spending on education is more beneficial to dominant language groups than to minority language groups in Pakistan.

Alternative Hypothesis 1 (H_A): Minority language groups receive a larger share of the benefits from public education spending than dominant language groups in Pakistan.

This hypothesis tests whether public spending on education is distributed equally across different language groups or whether certain language groups receive more benefits. If the alternative hypothesis holds, it may indicate disparities in the educational benefits received by different language groups in Pakistan. This hypothesis is further investigated through the following three hypotheses.

Hypothesis 2A:

H_0: Public spending on education at the primary education level is more beneficial to certain language groups than others in Pakistan.

H_A: Language groups with lower income receive a larger share of the benefits from public education spending at the primary education level than higher-income language groups.

Hypothesis 2B:

H_0: Public spending on education at the secondary education level is more beneficial to certain language groups than others in Pakistan.

H_A: Language groups with lower income receive a larger share of the benefits from public education spending at the secondary education level than higher-income language groups.

Hypothesis 2C:

H_0: Public spending on education at the higher education level is more beneficial to certain language groups than others in Pakistan.

H_A: Language groups with lower income receive a larger share of the benefits from public education spending at the higher education level than higher-income language groups.

1.2 Theoretical and Empirical Literature Review

The prominence of education in growth-oriented policies derives from the belief that education is a robust equalizer. Human capital is expected to generate both internal and external effects, with the latter indicating that the average level of education also contributes to eradicating inequalities (Easterbrook & Hadden, 2021; Tilak, 1987). Education improves income distribution and promote fairness in the distribution of

opportunities, which may allow people to experience prosperity and benefit more than privileged groups. Accordingly, it appears justifiable for public spending policies to prioritize reducing inequality to accelerate reasonably sustained growth (Anbumozhi et al., 2022).

Schultz (1999) established a theoretical link that individuals with a higher level of education earn, on average, a higher income, which implies that a more egalitarian distribution of education may effectively reduce income inequality. Sen (1999) emphasized that widespread illiteracy is a deprivation; therefore, resources and social provisioning must prioritize the elimination of these disadvantages for the affected population. Specifically, this requires a greater emphasis on primary education. This focus stems partly from recognizing that education spending allocation promotes equity (Gupta et al., 1999; Kirama, 2021; Tanzi & Chu, 1998).

Gallagher (1993) demonstrated that education spending positively affects educational attainment indicators after adjusting for quality and efficiency. Some contradictions in the evidence presented in the studies above can be attributed to the omission of relevant inequality issues. The fact that education spending is distributed unequally is disregarded; perhaps these resources may not be allocated in a way that benefits people with low incomes is another crucial issue. Mainardi (2007) contemplated that public education spending in emerging economies remains uneven. Inequitable social and geographical access to public education services appears to result from improper resource allocation. Inadequate facilities and significant disparities between major urban centers and other regions are among the deficiencies in educational service provision. According to Brueckner et al. (2022), specific communities, regions, and population segments in developing nations have disproportionately limited access to public resources. Such disparities in accessibility may contribute to educational disparities.

1.2.1 Public Spending on Education across Language Groups

Jackson and Marsden (1966) argued that ‘education cannot compensate for society’ is equally applicable in the Pakistani context. The main reason is that Pakistan’s educational system is entangled in, and increasingly driven by, political interests rather than one capable of equalizing economic inequalities. It is a system that reflects and replicates the hierarchical class relationships in society.

In Education and the Working Class, Jackson and Marsden argued:

“The educational system we need accepts and develops the best qualities of working-class living and brings these to meet our central culture. Such a system must partly grow out of common living, not merely imposed on it. But before this can begin, we must put aside any earlier attempts to select.”

It seems even more difficult in a period when the elite is unquestionable. Instead, our current political elite is restructuring the educational system, detraditionalizing the curriculum, and reintroducing policies that mark the middle classes as educational losers. When individuals have diverse preferences, there is a lower probability that fewer resources are pulled for public projects; for example, providing education in ethnically diverse societies is inversely related to disintegration (Easterly & Levine, 1997). In the presence of polarised ethnic groups, with polarised ethnic constituencies in the presence of politicians, the share of public spending that goes to public goods is low. The representatives of interest groups with an ethnic base are likely to value only the benefits of public spending that accrue to them and discount the benefits for other groups (Alesina et al., 1999). Therefore, the provision of public goods centres around the idea that coordination may be higher in a homogeneous group than in ethnically heterogeneous ones (Alesina & La Ferrara, 2005; Miguel & Gugerty, 2005).

Alesina et al. (1995) explored that in more heterogeneous societies, the public spends less on public goods using a cross-country database and focusing on health and education. On the other hand, Easterly et al. (1997) concluded that previous study findings could not be replicated for the education sector. Moreover, the literature concluded that linguistic heterogeneity strongly affects the efficiency of public spending outcomes across various linguistic and ethnic groups in the education sector (Gisselquist et al., 2016; Stichnoth & Van der Straeten, 2013).

Diverse socio-economic and linguistic groups are targeted when financing education. Many international organizations have reported socioeconomic indicators with notable variations across various income and linguistic groups (Chiswick & Miller, 1995; Dale-Olsen & Finseraas, 2020). Therefore, distributing educational spending's benefits implies fairness in targeting and dispersing the benefits across various language groups. Consequently, the distributional effects of educational spending across the spectrum of the population, i.e., the income, ethnic, and linguistic groups, are considered on an equal basis in terms of the provision of public education. In other words, regardless of their

socioeconomic status or linguistic group, everyone receives an equitable share of the financing for education (Dale-Olsen & Finseraas, 2020). Glewwe et al. (2020) argued that inequalities in the distribution of benefits of education spending exist as ethnic minority households did not benefit as much as ethnic majority households. Furthermore, socio-economic indicators reported by various international institutions demonstrate a huge inequality concern regarding the benefits of educational spending accrued to different ethnic groups (Alvaredo et al., 2018; Salmi & D'Addio, 2021).

Public education provision is justified when the market fails to provide education, resulting in suboptimal resource allocations, or when the market fails to provide education on efficiency grounds (Mitra, 2015). Consequently, governments are required to uphold equity standards. The fact that the poor are disadvantaged in gaining access to essential services that would aid in their escape from poverty suggests that the state should target education provision to these groups (Ajwad & Wodon, 2002; Amakom, 2020). These groups include the various racial and socio-economic groups in a country.

How to quantify the benefits of publicly provided goods to individuals has been a topic of concern in the economics literature for a long time. Unlike market-based goods and services, the respective benefits of publicly provided goods cannot be assessed on the same grounds as the market-based goods and services can be interpreted as reflecting underlying values through prices. However, it is challenging to use prices as a basis for valuing publicly provided goods (Cuesta et al., 2021; Van de Walle & Nead, 1995). However, it is challenging to use prices as a basis for valuing publicly provided goods (Cuesta et al., 2021; Van de Walle & Nead, 1995).

Betts and Roemer (2005) found that, on average, race and language groups spend vastly different amounts on education. Nonetheless, the likelihood of attending college and socioeconomic factors influence families' investment in higher education—and, contrary to popular belief, race and ethnicity are not the driving factors. This research analyzed 90,872 Consumer Expenditure Survey observations from 2008 through 2010. The results show more to the story than average expenditures by race and ethnicity. Consumer Expenditure Survey data on US households show that between 2008 and 2010, US households spent $357 per year on higher education on average. Hispanic and African American households spent 57 percent and 69 percent less on tuition than White households. Asian households spent 57 percent more on college than White households.

Furthermore, some of the disparities in education spending can be attributed to different higher education participation rates among various groups. According to Consumer Expenditure Survey data, Asian families are more likely than other groups to send their children to college and spend more on education on average. However, average higher-education spending across all households is insufficient because it does not distinguish between families with college-going students and those without, nor does it compare households of different races and ethnicities on an equal socioeconomic level. However, these minor differences in education spending are not statistically significant. When families with comparable household incomes and parental education levels are compared, higher education spending levels are the same across all races and ethnicities. Another point of view is that socioeconomic differences, rather than differences in race or ethnicity, significantly impact how families value higher education investments.

1.2.2 The Incidence of Public Spending on Education across Various Income Groups

The role of education in economic growth has been addressed by (Barro, 2002; Barro & Lee, 2001; Judson, 1998), without considering the need for efficient ways in which resources are allocated at various levels of education. Two critical contemplations for educational investment decisions exist, i.e., the level of education and the individuals to be educated. The return to educational investment from schooling is a function of both types of education and the targeted groups to distribute public investment in education.

Bose et al. (2003) focused on sectoral expenditures for a panel of thirty developing countries using data from 1970 to 1990. They concluded that the share of expenditure on education and GDP are positively and significantly correlated. Moreover, at the sectoral level, public investment and total expenditures in education are significantly associated with growth (Todd & Wolpin, 2007). At the same time, the association between public spending on primary education and the human capital accumulation process impacts economic growth. Changes in the level of investment with various levels of education have different significance regarding the public spending on education and economic growth impacts (Teles & Andrade, 2008). Blankenau and Simpson (2004) found public education spending and long-run growth for developed countries, using panel data from 23 countries, and concluded that public spending on education has no significant growth effects on

education spending. Alternatively, Angelopoulos et al. (2007) explored that public spending on education brings growth and promotes welfare.

Existing literature ignored the other side of the picture, i.e., the distributional impact of public spending. It incorporates the inequality issues involved in distributing benefits resulting from public spending. Norman et al. (1985) found that higher-income groups receive more benefits than the poor, and state education spending Favours the rich more than the poor. (Jackson & Schneider, 2022) believed that a higher level of education is regressive, whereas spending on primary education is highly progressive. The literature presented the incidence of public education spending. It concluded that the poorest quintile of income groups receives 14 percent, the poorest half receives 36 percent, and the richest quintile receives 33 percent. Although school enrolments increased substantially during the 1990s, the growth was not distributed evenly across provinces and ethnic groups (Nguyen, 2004).

Cuenca (2008) offered the benefit incidence of the 1998 public spending graphically using income deciles based on households. It was concluded that government spending in elementary and secondary education was progressive in absolute terms as the concentration curves lay above the diagonal. In contrast, government spending on college education was regressive in absolute terms, as indicated by its concentration curve below the diagonal. Wealthier households cause the progressivity in elementary and secondary education that is publicly funded to prefer private schooling to public schooling, and households in the poorest deciles have more children than those in the richer deciles. Similarly (Gafar, 2006) showed that primary and secondary education benefit poor people with low incomes while the non-poor are principal beneficiaries of education subsidies.

The divide between the rich and poor in education spending grew considerably in several cases. Under such conditions, it may be easy to view that the education system is responsible in some contexts where the elite designed formal education to maintain, replicate, and augment economic and social inequalities instead of eliminating them. While this may be accurate for some countries, the benefits of educational spending did not reach the masses because of an unequal distribution of education spending in most emerging economies (Carnoy, 2011). An unequal distribution of educational spending indicates that the empowered elite enjoys a significant portion of resources in education (Mitra, 2015).

Furthermore, the elite typically captures the benefits of education, such as superior occupations and higher incomes, because of their hegemonic control over education.

On the other hand, marginalized individuals typically differentiated by gender, language group, religion, geography, income, and social class—characteristically, receive an insignificant portion of total educational spending. Invariably, this leads to individuals having inferior occupations and lower incomes than the elite. However, occupational and income inequality is not the only adverse outcome associated with educational inequality. Disproportionate social mobility also occurs when educational inequality exists.

Duflo and Banerjee (2011) Paul conducted research indicating that parents tend to invest in their children's education if they perceive them to possess high academic potential. This assertion suggests that allocating children's education solely to their parents would be inequitable. In addition, children from impoverished backgrounds with elevated levels of intelligence exhibit a greater propensity for non-attendance compared to their affluent counterparts with average cognitive abilities. The educational quality of underprivileged children is likely inferior to that of their affluent counterparts. The pursuit of education, particularly in developing nations such as Pakistan, cannot be solely approached from a demand-side perspective. Elementary education must be mandatory for all individuals, as is the norm in developed nations. If public spending on education is pro-poor, the state must increase its investment in education for low-income individuals.

1.2.3 Literature and Theoretical Background of Measuring Benefits of Public Spending on Education

Instead of an unconditional increase in educational spending, it is necessary to distribute the benefits of public education spending across various income and language groups (Brown & James, 2020; Crompton, 2008). There are several ways to assess the equality of the benefit distribution. There are various methods to evaluate this distributional justice of the benefits. At the same time, though, they emphasize that the diversity of the evaluation criteria and methods has made the issue more focused across various income and language groups.

Literature on the influence of public spending on education by measuring its distributional effects came with various conclusions. First, the question of the equality of the benefits by all the individuals of the target society is addressed by using the BIA

(Younger, 2003a), also named "utilization incidence analysis (UIA)" (Malik & Ashraf, 2016). Second, the benefit provided based on the background information calculates the distribution of services across various income distribution groups in a society. Thus, Public spending on education incorporates the core concerns regarding assessing the distributional impact on the poor segment of the population (Ahuja & Pandit, 2022; Davoodi et al., 2010; Demery, 2003).

The BIA was applied to household data in mainstream studies. A vast body of literature exists on the incidence of public spending. Most of the studies have used the BIA on household data. Findings demonstrate that public spending is either progressive or regressive. The share of various income groups varies depending on how benefits of public spending are distributed across the region, caste, gender, language speakers, religion, and gender (Asante et al., 2019; Christian, 2002; Demery & Gaddis, 2009; Younger, 2003b).

Like other developing nations, Pakistan faces difficulties designing and implementing a fiscal policy without an effective progressive tax policy and effectual tax management to alter the post-tax income distribution (Alesina, 1999; Atkinson, 2000; Chu, Davoodi, and Gupta, 2000). Correspondingly, for a certain number of resources, these countries demonstrate a limited managerial capacity and inadequate tools for executing public spending programs that could change the post-transfer distribution of income and other welfare indicators (Bourguignon, Pereira da Silva, and Stern, 2002). Consequently, governments in emerging economies typically distribute resources through in-kind transfers, primarily for delivering social services such as social safety net programs, i.e., education and healthcare. Even though other classifications of public spending are also critical for individual welfare, education is characteristically viewed as the prime variable for increasing the long-term productivity of individuals, particularly people with low incomes. Considering the size of public spending in the budget, improving the quality of fiscal adjustment is desired. However, macroeconomic stability is the integrated target the policymakers are attempting to achieve through increasing the efficiency of spending policy, primarily the public spending on education and the spending management mechanism.

Increasing the proportion of public spending is one way many developing nations attempt to balance their budgets. They also ensure that low-income people receive a fair and proportionate share of the increased public financial allocation. Based on efficiency

and equity, the case for public education is well-established (Demery, 2000). The public is expected to prioritize providing these services to people experiencing poverty because of limited access to services that could help them escape poverty. However, how can one tell if the increased or current allocation is helping people experiencing poverty? The tool BIA answers the previously raised research question.

1.3 Data and Methodology

This section elaborates on the data used and the methodological details of the research.

1.3.1 Description of the Education System in Pakistan

This section aims to discuss Pakistan's educational system. Pakistan's school education outcome indicators are inadequate; an estimated 22.9 million children aged 5–16 are out of school (Haider et al., 2021). School participation and completion rates remain persistently low, particularly at the secondary level, which is relatively lower in the region and when compared with other low-middle-income countries (Shah et al., 2019). Wide disparities persist in public education spending across various income and language groups. Therefore, this research focuses on digging into more profound educational spending and various educational indicators among various educational groups.

1.3.1.1 The Current Education System in Pakistan

In 1947, with the emergence of Pakistan, education faced significant challenges, i.e., the country had a weak administrative infrastructure and inadequate financial resources (Shallwani, 2019). Pakistan's educational system, thus, had to start from remnants. The government recommended free and compulsory education in 1947 at the first educational conference. Pakistan's Constituent Assembly passed the Objectives Resolution in March 1949 that declared Islamic ideology as the substratum of the country's constitution. Among the objectives was that the educational system shall be instrumental in shaping a value-based society, protecting and promoting its Islamic heritage, and transferring ethical values to new generations. In 1971, the country's constitution affirmed education as a universal right, with at least 10 years of education to be provided by the government. It is important to note that while Pakistan's population was 34 million in 1951, in 2021, the number rose to about 224 million; therefore, the rise in the number of school-going children, inefficient

educational resource distribution, inconsistent educational and language policies impacted the quality of education that is still considered as poor (Sah, 2022).

a. Preschool Education

Early childhood education (ECE), called *katchi* or *pre-primary*, is an informal or formal education service for children under 5 years. Preschool education was stopped during the 1980s and reinstated in public and private schools at the end of the 1990s. Nursery, kindergarten, or Montessori-style education was also introduced in profit-making private schools, usually in urban localities.

b. Primary Education

Primary education is basic elementary education from grades 1 to 5, where children are admitted to schools at 5 and over. Based on the three-tier education system model under application, primary education is the first stage of elementary education.

c. Secondary Education

Secondary education is subdivided into three phases. First, middle-level education is attributed to grades 6 to 8; second, secondary education is considered as grades 9 to 10 provided in high schools; third, the higher secondary education of grades 11 to 12 in higher secondary schools and intermediate and degree colleges.

d. Higher Education

Higher education is offered in universities and colleges. It provides a two-year degree, referred to as a bachelor's (pass), and the three-year degree is a bachelor's (honors). Higher education includes four years of professional bachelor's degrees in engineering, agriculture, pharmacy, veterinary, and medicine. At the postgraduate level, master's degree programs take 2 years to complete. However, it depends on the duration of the previous degree to take four years. Department of Education has started Bachelor of Science (BS) 4 years in degree colleges and universities. The Master of Philosophy (M.Phil.) and Master of Science (MS) degree is awarded after 18 years of education in any university, and this two-year research degree program leading to the award of a doctoral degree (PhD) usually requires three to four years of study andresearch (NORRIC, 2006).

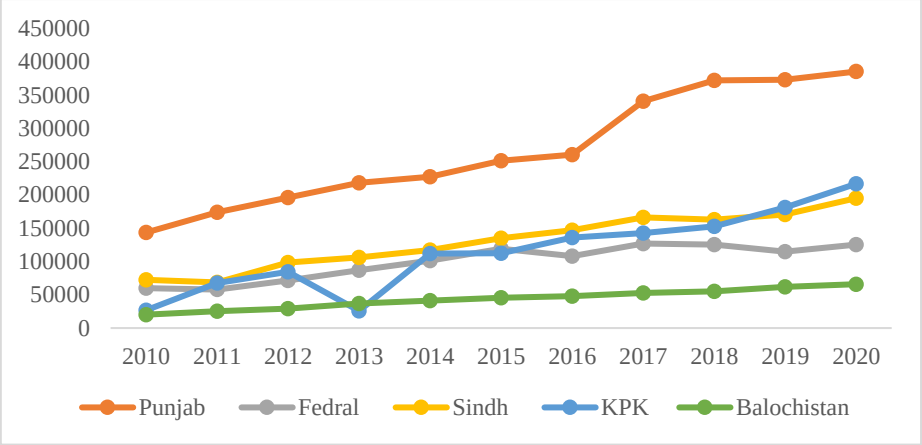
Age	Education Level	Grades	
15-16	Higher Secondary	11-12	Secondary Education
13-14	Lower Secondary	9-10	
10-12	Middle	6-8	
5-9	Primary	1-5	Elementary Education
3-4	Pre-Primary	Early Childhood Education	

Figure 1-4: Structure of School Education in Pakistan

1.3.1.2 Financing Education

Education in the country has suffered for years from a lack of resources and policy changes, leading to a deterioration of education quality (Alderman et al., 2001; Amjad & Kemal, 1997; Nawab, 2017). The country's historically low education indicators highlight the need for the Pakistani government to increase education spending regularly. According to the literature on educational outcomes, the first step is a minimum level of investment and equitable distribution of resources in emerging countries' basic infrastructure and human resources (Colclough & Lewin, 1993). Funds for public education spending in Pakistan are provided by federal revenues, which are then distributed to provinces by the National Finance Commission (NFC), with shares allocated to provinces based on the investment required in education.

Furthermore, the proportion of national income and resources allocated to education demonstrates the sector's priority and recognition of its economic and human development contribution. As a result, for the past 20 years, Pakistan's public spending on education has remained below 2 percent of the GDP (Figure 1). However, underutilizing public education spending, i.e., lack of capacity to use financial resources, impedes educational quality in severe capacity constraints (Qureshi & Kalsoom, 2022).



Source: Pakistan Economic Survey (Various Issues)

Figure 1-5: Total Expenditure on Education (Rs. Million)

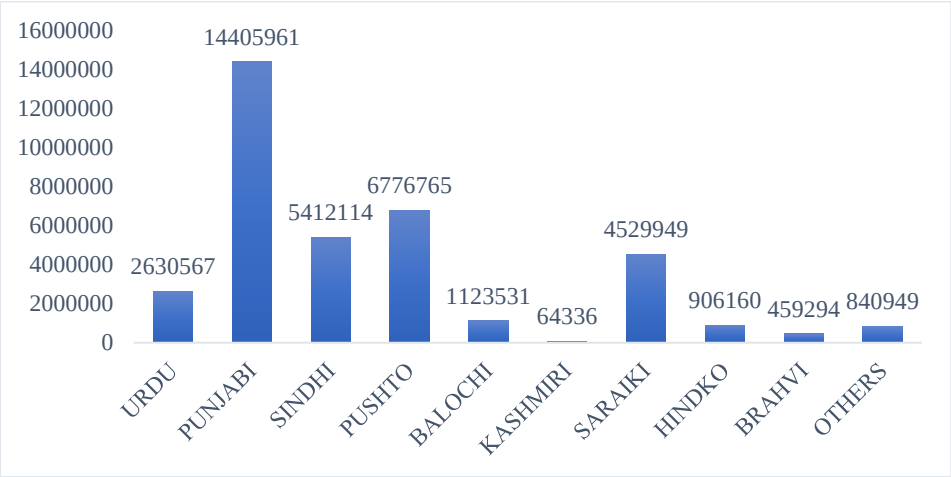
Figure 1-5 shows the trends in education spending in Punjab, Sindh, KP, Baluchistan, and the Federal from 2010 to 2020. As the graph above shows, Punjab has increased its highest education spending over time. In this regard, Punjab spends more on education than other provinces in Pakistan. The blue trend line, which depicts KP's educational spending, began to rise and move upward over time after falling in 2013. Like the federal government, Sindh's spending on education is slowly rising. The green trend line shows Baluchistan's slowly rising education spending. It elaborates on the slight increase in spending over time in a straight line.

Ministry of Education (2007) financial resources were allocated at a rate of 2.5 percent in 2007, 2.47 percent in 2008, 2.1 percent in 2009, and 2.0 percent in 2010. However, the HEC only received 50 percent of the necessary funding in 2010, decreasing research and higher education standards. In addition, subsequent years saw a further reduction of this budget to another 50 percent. Public spending on education has remained flat, and the GDP devoted to this industry has stayed close to 2 percent (Amin et al., 2021; Furqan et al., 2022).

1.3.1.3 Education Enrollments across Various Mother Language Speakers

The distribution of enrolment in Pakistan in 2018 by mother language, including Punjabi, Sindhi, Pushto, Baloch, Kashmiri, Hindko, Brahvi, Saraiki, and others, is shown in Figure 1-6. With 14405961 education enrolments, Punjabi language speakers have the highest overall enrolments in Pakistan. Similarly, with 6776765 enrolments, Pushto language speakers have the second-highest enrolments in various educational institutions.

Additionally, Sindhi, Saraiki, and Urdu mother language speakers have fewer students enrolled than those who speak Panjabi and Pushto.



Source: Population Census (2017) and World Inequality Database on Education (2018)

Figure 1-6: Distribution of Enrollments By Mother Language Speakers in Pakistan

The 4 clustered figures below depict the enrolment distribution by mother language speakers in 2018, including Punjabi, Sindhi, Pushto, Balochi, Kashmiri, Hindko, Brahvi, Saraiki, Urdu, and others across different provinces in Pakistan. Figure 1-7 contemplates the number of Punjabi mother language speakers enrolled in various educational institutions in Punjab is 14721491, followed by the number of Saraiki mother language speakers enrolled in Punjab, totaling 4370305. Urdu, Pushto, Balochi, Hindko, Urdu, and Pushto, mother language speakers, have fallen behind the enrolment mentioned above, further illustrating that Punjab has the highest proportion of its population speaking Punjabi as a mother language.

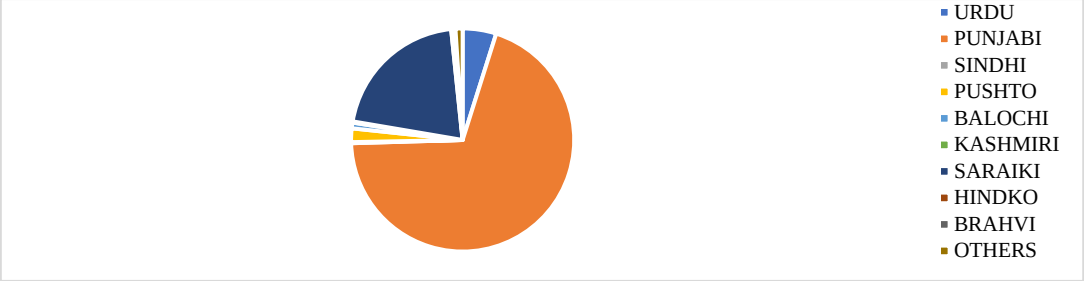


Figure 1-7: Distribution of Enrolments by Mother Language in Punjab

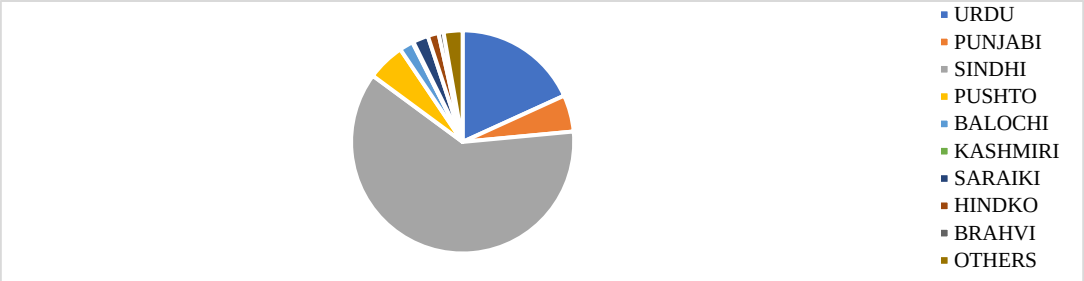


Figure 1-8: Distribution of Enrolments by Mother Language in Sindh

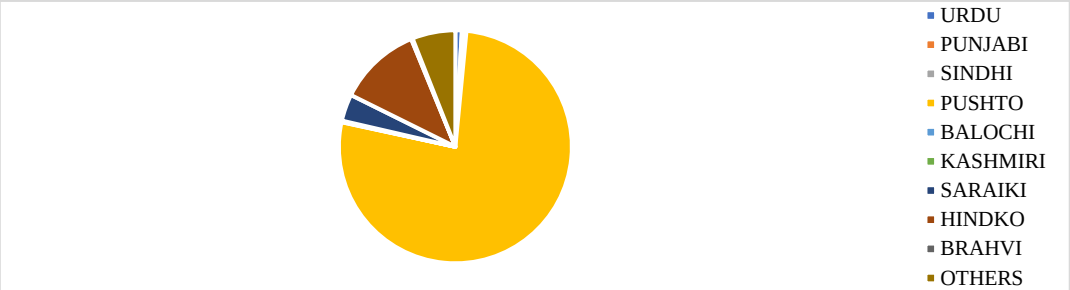


Figure 1-9: Distribution of Enrolments by Mother Language in KP

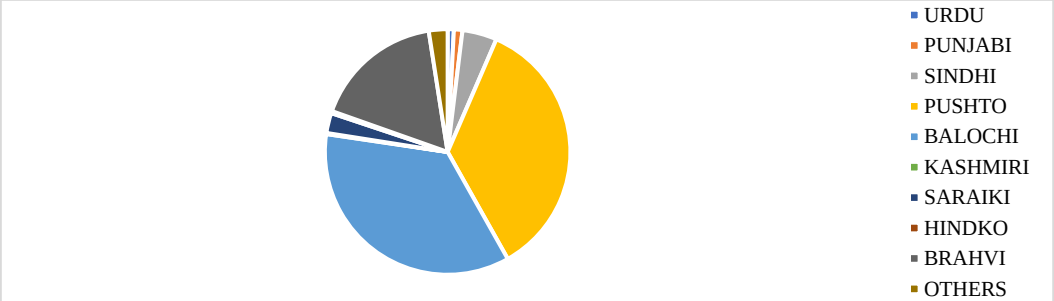


Figure 1-10: Distribution of Enrolments by Mother language in Baluchistan

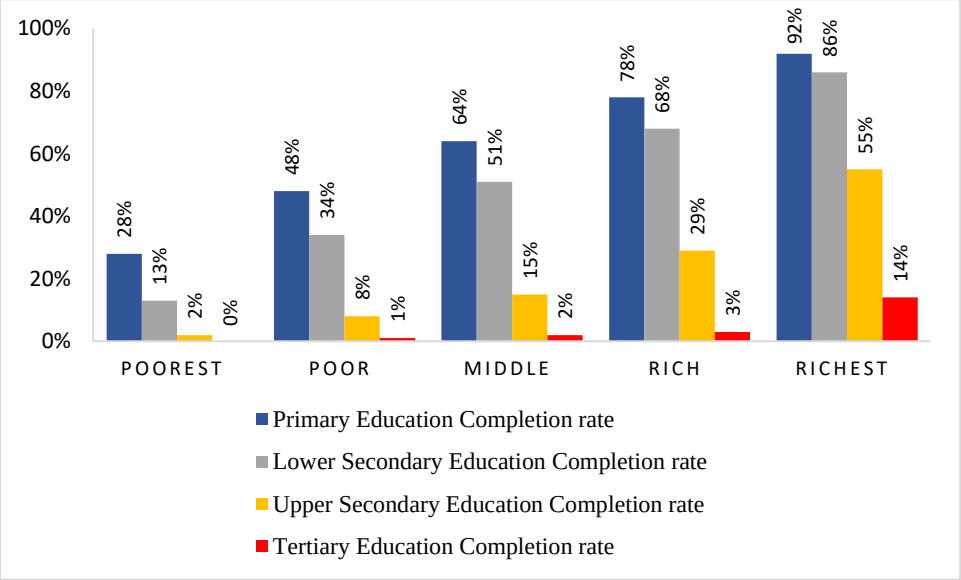
Source: Author's estimations using Pakistan Population Census (2017), Pakistan Educational Statistics (2017/18), and World Inequality Database on Education (2018)

Note: Data is presented in total numbers

Figure 1-8 depicts that Sindhi mother language speakers in Sindh have the highest overall enrolments in education with 5048987, while Urdu mother language speakers in Sindh have the second highest enrolments with 1491518. All other enrolments are lower than these; Sindhi's mother language speakers are followed by Urdu, Pushto, Punjabi, other, Saraiki, Balochi, and Hindko speakers. Figure 1-9 depicts the KP enrolment

distribution by mother language, with Pushto mother language speakers having the highest enrolment at 5002344, followed by Hindko mother language speakers with a total enrolment of 747057. Figure 1-10 demonstrates that the province of Baluchistan has the highest education enrolments among Balochi's mother language speakers, with a total of 466392, and the second highest enrolment among Pushto language speakers, with 464443 education enrollments.

1.3.1.4 Educational Completion Rate by Income Groups

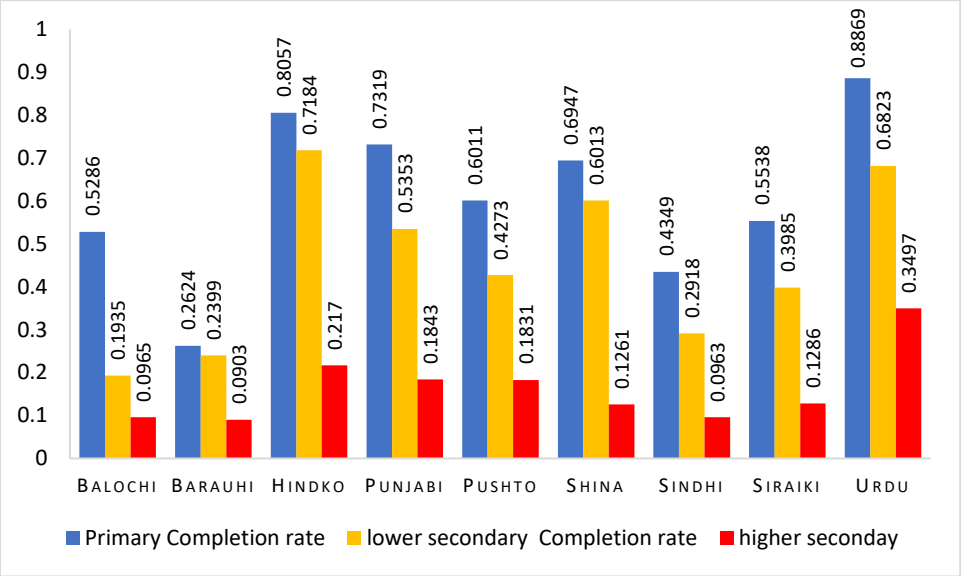


Source: World Inequality Database on Education (2018)

Figure 1-11: Education Completion Rate by Income Groups in 2018

Figure 1-11 depicts the education completion rate in Pakistan by income group in 2018: poorest, poor, middle, rich, and richest. According to the above graph, the richest group has the highest overall completion rate with primary education (92 percent), lower secondary (86 percent), upper secondary (55 percent), and higher (14 percent). Similarly, the richest group has the second highest completion rate for primary, lower secondary, upper secondary, and higher education, with 78 percent, 68 percent, 29 percent, and 3 percent, respectively. In addition, the poor group ranks last and lowest regarding minimum education completion rates.

1.3.1.5 Educational Completion Rate by Various Language Speakers



Source: World Inequality Database on Education (2018)

Figure 1-12: Educational Completion Rate by Various Language Speakers

Figure 1-12 depicts the education completion rate in Pakistan by different language speakers in 2018, including Urdu, Saraiki, Sindhi, Shina, Pushto, Punjabi, Hindko, Barauhi, and Balochi. Figure 1-12 shows that the educational completion rate in primary education is 88.6 percent in Urdu, 81 percent in Hindko, 73.2 percent in Punjabi, 69.5 percent in Shina, 60.1 percent in Pushto, 55.4 percent in Saraiki, and 53 percent in Balochi. With varying education completion rates, the Hindko, Urdu, Shina, and Punjabi language groups have lower secondary completion rates of more than 50 percent. In terms of higher secondary education completion rate, Urdu has a higher completion rate than other languages, at 35 percent. However, the completion rate of higher secondary education ranges between 9 and 10 percent for Barauhi, Sindhi, and Balochi languages. Higher secondary education completed education for Barauhi, Sindhi, and Balochi language groups range from 9 to 10 percent. In contrast, Hindko, Pushto, Punjabi, and Saraiki have higher completion rates at the higher secondary level, with 21 percent, 18 percent, 18 percent, and 13 percent, respectively.

1.3.2 Data Sources

This research analyzed the "Average Benefit Incidence" of public spending on education. There is substantial diversity in public spending on education, ranging from

educational enrollments across various levels of education, income groups, and language groups. All these categories are recorded in the collected data set. However, this research analyzes only the benefit incidence of public spending on education across income and language groups at various levels of education using cross-sectional data. BIA is based on budgetary allocations to education, where most studies use recurrent spending on education. Data is collected from the Household Integrated Economic Survey (HIES) (2018/19) to estimate the benefit incidence on education enrolment at primary, secondary, and higher levels of schooling, which is further distributed into various income groups (i.e., income deciles) at various levels of education. Annual Budget Statistics (ABS, 2018/19) collect estimates of public spending on education.

Furthermore, the data on education enrolment at primary, secondary, and higher levels of education respective to various language groups are collected from the World Inequality Database on Education (WIDE) compiled by UNESCO, which highlights the inequalities in education across wealth, language, ethnicity, and location, over which people have little control. Still, these factors play a significant role in determining education opportunities. Moreover, enrollment shares of various language groups (Urdu, Punjabi, Sindhi, Pushto, Balochi, Saraiki, Hindko, Brahvi, and Others) are estimated using the Pakistan population census (2017). Unlike calculating the benefits of public spending at various levels of education, this study bridges the research gap by introducing the variations in public spending across various language groups at various levels of education.

Table 1-1 Description of Variables Used in the Benefit Incidence Analysis (BIA)

Variables	Definition	Source	Source link
Education enrolment at the primary level	Total number of students enrolled in public schools in Primary education from grades 1 to 5, where children are admitted to schools at 5 and over.	HIES 2018/19	https://www.pbs.gov.pk/publication/household-integrated-economic-survey-hies-2018-19
		Pakistan Education Statistics 2017/2018	http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202017-18.pdf
Education enrolment in secondary level	Total number of students enrolled in public schools in Secondary education, (1) middle-level education 6 to 8 grades (2) secondary-level 9 to 10 grades (3) the higher secondary education of grades 11 to 12	HIES 2018/19	https://www.pbs.gov.pk/publication/household-integrated-economic-survey-hies-2018-19
		Pakistan Education Statistics 2017/2018	http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202017-18.pdf
Education enrolment in Higher level	Total number of students enrolled in public sector universities and post-graduate institutes, which include BA/B.Sc., BS, MS/M.Phil., and Ph.D. Level.	HIES 2018/19	https://www.pbs.gov.pk/publication/household-integrated-economic-survey-hies-2018-19
		Pakistan Education Statistics 2017/2018	http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202017-18.pdf
Income groups	Income deciles are estimated based on individual's income	HIES 2018/19	https://www.pbs.gov.pk/publication/household-integrated-economic-survey-hies-2018-19
Education expenditures	Pakistan's public spending on education in millions of rupees.	Government of Pakistan Annual Budget statement	https://www.finance.gov.pk/budget/Annual_Budget_Statement_2018_19.pdf

		Government of Punjab Annual Budget statement	https://finance.punjab.gov.pk/system/files/ABs18192.pdf
		Government of KP Annual Budget statement	https://www.finance.gkp.pk/article/annual-budget-statement-2018-19
		Government of Sindh Annual Budget statement	https://finance.gos.pk/Home/Download?path=Budget%5CBudgetBooks%5CFY-18-19%5CVOULME-I.pdf
		Government of Baluchistan Annual Budget statement	https://www.finance.gob.pk/wp-content/uploads/2021/01/ABS-2018-19.pdf
Language-based educational enrolment	Total number of students enrolled in public schools who share diverse linguistic backgrounds and speak different mother languages at home. Enrollment shares of various language groups such as Urdu, Punjabi, Sindhi, Pushto, Balochi, Saraiki, Hindko, Brahvi, and Others are based on the Pakistan population census (2017).	World Inequality Database on Education (WIDE) compiled by UNESCO	https://www.education-inequalities.org/countries/pakistan
		Pakistan population census (2017)	https://www.pbs.gov.pk/content/final-results-census-2017

1.3.3 Variable construction

1. **Education enrolment**

   The HIES (2018/19) data was used to calculate educational enrollment at various levels. Primary education enrollment was defined as the total number of students enrolled in public schools from grades 1 to 5, where children are typically admitted at age 5 or older. Secondary school enrollment was calculated across three categories: (1) middle-level education (grades 6 to 8), (2) secondary-level education (grades 9 and 10), and (3) higher secondary education (grades 11 and 12). Higher education enrollment was determined by the total number of students enrolled in public sector universities and postgraduate institutes, including BA/BSc, BS, MS/MPhil, and PhD programs. After estimating these enrollment figures from the HIES data, further validation was conducted by cross-referencing the numbers with those provided by the Pakistan Educational Statistics (2018). This cross-checking process confirmed the accuracy of the estimated variables and further provided reliability for the study.

2. **Language-based educational enrolment speakers**

   Furthermore, the data on education enrolment at primary, secondary, and higher levels of education respective to various language groups are collected from the World Inequality Database on Education (WIDE) compiled by UNESCO, which highlights the inequalities in education across wealth, language, ethnicity, and location, over which people have little control. Still, these factors play a significant role in determining education opportunities. Moreover, enrollment shares of various language groups (Urdu, Punjabi, Sindhi, Pushto, Balochi, Saraiki, Hindko, Brahvi, and Others) are estimated using the Pakistan population census (2017). The total enrollment in primary, secondary, and higher education levels is subdivided depending on the proportion of each language-speaking group in the population, using the methodology of BIA as it is used to distribute the educational expenditures. This technique assumes that the proportion of each language-speaking group's enrollment in primary, secondary, and higher education levels is equivalent to its proportion in the total population. Therefore, the distribution of enrollments in various education levels precisely corresponds to the demographic distribution of each linguistic

group. The proportional allocation is derived from the census data released by the Pakistan Bureau of Statistics 2017.

3. **Income groups**

   Household income comprises regular and recurring revenues received by the household or individual household members at least once a year or more frequently. Household income primarily comes from employees' salaries, wages, and other employer earnings. It also includes the operating surplus from small enterprises in non-agricultural and non-financial sectors with less than 10 employees and the operating surplus from agriculture. Additionally, household income includes the withdrawal of entrepreneurial income for proprietors who employ ten or more people in the mentioned industry divisions. Lastly, income from personal investments such as rent, interest, dividends, and royalties also contribute to household income.

   Household cash income encompasses all monetary receipts, including wages, salaries, rental income, self-employment earnings, gifts, and aid. Subsequently, Income deciles are determined based on income distribution over the entire population, including all individuals. Moreover, to validate this distribution, the data was validated based on WIDE estimates, confirming the reliability of the estimated variables used for BIA analysis.

4. **Education expenditures**

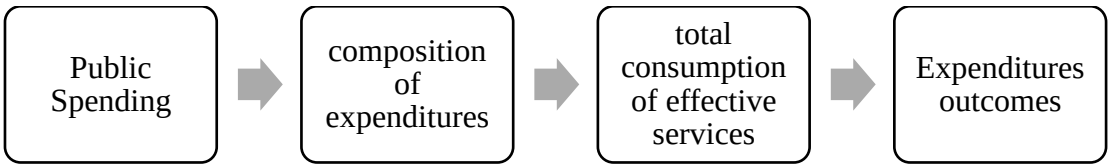
   The education expenditure variable is derived from statistics on Pakistan's public allocation of funds towards education, calculated in millions of rupees. The data is obtained from the yearly budget statements issued by the Government of Pakistan and the province governments of Punjab, Khyber Pakhtunkhwa (KP), Sindh, and Baluchistan. The variable was constructed by extracting the total education expenditures for each fiscal year from the budget statements of the federal and provincial governments. The figures encompass budgetary provisions for different education levels, including primary, secondary, and tertiary education. The provincial government's expenditures were combined with the federal government's spending to get the country's total public spending on education, representing the overall public spending in education throughout Pakistan.

1.3.4 Benefit Incidence Analysis (BIA)

An incidence analysis determines who gains or losses when the government pursues a particular tax or expenditure policy. This question has intrigued economists, at least since the time of David Ricardo, who analyzed the impact of the Corn Laws' taxes. The theoretical literature on benefit incidence is divided into three periods, where the first wave demonstrated the earliest evidence (Gillespie, 1966). Later, Aaron and McGuire (1970) developed principles to assess the individual benefits of Public spending. The BIA was utilized for the distributional impacts of public spending (Meerman, 1979b; Selowsky, 1979a). However, in recent literature, BIA has been modified and incorporated in many recent pieces of research (Glick, 2008; Heltberg et al., 2003; Kirama, 2021). Worldwide, benefits gained from public investment in education using BIA remain a debatable concern for researchers. They explored the distribution of benefits from the public provision of various services, i.e., education (Akram & Khan, 2007; Younger, 2003a). At the same time, they expanded the range of public spending among other socio-economic groups across a range of services to analyze the distribution of public subsidies using BIA (Demery, 2003). In addition to the inherent difficulties in estimating these assessments, researchers have developed that a publicly provided service should be weighed based on the individual's assessment of the service provided (Cuesta et al., 2021; De Wulf, 1975). However, alternative approaches proposed that publicly provided services should be evaluated based on marginal cost (Brennan, 1976; Scherf & Weinzierl, 2020).

Moreover, BIA brings together the cost of providing public services with evidence of allocating the benefits of public spending across individuals and different groups (Jenkins, 1980; Sahn & Younger, 2000). Following this argument, BIA comprises elements of public service demand and supply and provides valued information regarding ineffectiveness and unfairness in public resource allocation for education (Fiala & Delamonica, 2022). BIA is a fundamental and effective tool for ex-ante and ex-post monitoring and evaluation of social spending programs conducted in various countries, including emerging, middle-income, and advanced economies. These considerations may be reflected in the recent addition of BIA to the World Bank's practical toolkit for Poverty and Social Impact Analysis (PSIA) of economic policies (Lanjouw & Ravallion, 1999; Love-Koh et al., 2020; Younger, 2003b).

Regarding the significance of distributional concerns, BIA provides thorough reflections on the incidence of public spending, i.e., the degree to which various population groups (poor/rich, urban/rural, ethnic groups) benefit from the current allocation of public spending.



Source: Filmer, Hammer, and Pritchett (1998)

It distinguishes four fundamental links, beginning with the link between total public spending and its composition, where this link may be more robust if spending benefits individuals. Furthermore, the other link is associated with budget execution into practical results. Ablo and Reinikka (1998) calculated the value of every dollar invested in education in the emerging market economy. Furthermore, the third link confirms how public spending influences the total provision of adequate services. In contrast, the final link is between the provision of public goods and individual outcomes.

1.3.5 Theoretical Methodology- The Benefit Incidence Analysis

Gillespie (1966) provided the earliest examples of analyses of the incidence of social spending. Later, the BIA methodology was introduced in its current form with several modifications to BIA's original methodology (Meerman, 1979b; Selowsky, 1979a). The BIA follows a five-step procedure that is illustrated in the subsequent discussion.

First. Determine the average unit cost of providing a public service, i.e., education (after deducting any cost recovery fees, out-of-pocket expenses incurred by service users, or user fees) by the total number of service users.

Service users are regarded as the ultimate beneficiaries of the service (e.g., students enrolled in elementary and secondary schools, colleges, and universities). The number of users is determined through a household survey, although information from service providers may be more accurate regarding the number of users; however, there may be discrepancies between officially reported statistics and survey results regarding the number of service users. In the current research, the household survey PSLM is representative of the population, and its scope corresponds to the purpose of the study.

Second. Define the average benefit of public spending on service as the average unit cost of providing the service, which was determined in the preceding step.

This consistent assumption "imputes" the benefits of public transfers in kind to the welfare of individuals, as measured by their income.

Third. Using a welfare measure, rank the users from poorest to richest (or any other) and aggregate them into equal-sized groups.

This step is simple to execute; however, it requires the selection of alternative units of analysis. In a household survey, the unit of analysis can be either the household, which consists of all family members living together, or an individual within the household, and the typical welfare indicator is income or consumption. Both sets of information are required to rank users. Demery (2003) suggested defining deciles as individuals when a service is provided to individuals (e.g., enrolled students in a school) and by households (household deciles) when a service is provided to households (e.g., water and sanitation services). Even though grouping the ranked population is not required, BIA typically aggregates the ranked users into equal groups, such as deciles. Other groupings are possible, subject to design constraints, including poor versus non-poor, where the poverty line defines the dividing line, rural versus urban, male versus female, ethnicity, region, religion, age, race, or parental educational background.

Fourth. Determine the distribution of benefits by multiplying the average benefit derived in step three by the number of service users in each income group.

The fourth step implicitly assumes that the average service delivery benefit or cost is unaffected by income, consumption level, or other variables. This premise eliminates various issues involved in the estimation of BIA. As stated previously, the quantity of service provided to each user may vary due to differences in spending. Second, households may value a given service differently. Typically, a BIA assumes that the quality of a service is the same in rural and urban areas. Regarding variation in the value of a given service to different users, a demand-function approach to estimating benefit incidence would be more appropriate despite being computationally and data-intensive. As described in the following section, BIA cannot respond to all these criticisms.

Fifth. Compare the resulting distribution of benefits to several standard distributions.

From a policy perspective, this final step is the most critical part of a BIA because it tells policymakers how well public spending on service is targeted. Furthermore, BIA

elaborates on how the resulting benefit compares with the incidence of other types of public spending (for example, primary education versus secondary and higher education).

1.3.6 Empirical Methodology - The Benefit Incidence Analysis Across Various Income Groups

The first four steps can now be illustrated by applying elementary algebra in the case of public spending on education. Total benefits from public spending on all levels of education (i.e., the sum of primary, secondary, and higher spending) depend on two factors: the use of publicly funded services by that group and the distribution of public spending, which can be illustrated by:

$$\boldsymbol{X_j = \sum_{i=1}^{n} E_{ij} \frac{S_i}{E_i} = \sum_{i=1}^{n} \frac{E_{ij}}{E_i} S_i}$$

Equation 1-1

Xj represents the entire amount of public education spending allocated to group j. Eij is the number of students enrolled in group "j," at education level "i," and Ei is the total number of students enrolled at that level (across all groups)? The ratio $\frac{Si}{Ei}$ is the unit cost of providing education at level i. Groups are typically ordered from lowest to highest concerning income. Education spending is assumed to vary across education levels but not across groups. Using the equation above, we can check the total public spending on education for all demographic groups (i.e., X1 + X2 +... + Xp).

By dividing both sides of equation 2-1 by total (net) public spending on education, S, one obtains the share of benefits accrued to group j from total public spending on education that is illustrated below:

$$\boldsymbol{X_j = \sum_{i=1}^{n} \left(\frac{E_{ij}}{E_i}\right) \times \left(\frac{S_i}{S}\right)}$$

Equation 1-2

$$X_j = \sum_{i=1}^{n} e_{ij} s_{ij}$$

Equation 1-3

where $x_j = \frac{X_j}{S}$; e_{ij} is the group j share of total students enrolled at primary, secondary, and higher levels; s_{ij} is the share of public spending at a given level of education, i, in total public education spending. Equation 1-2 demonstrate that a given

individual's group receives more if that group utilizes more of the public spending. Consequently, estimates of benefit incidence capture behavior from both perspectives. i.e., public spending itself and users of public spending.

BIA makes no mention of the determining factors for $eij\ and\ si$. While applying BIA to each level of education also demonstrates that each decile's share of benefit incidence from spending at any given level is proportional to the decile's average participation rate (where the population is divided across deciles). To ensure that spending on primary education, for instance, benefits people with low incomes, one might adopt policies that encourage the poor to utilize primary education more intensively than individuals with higher incomes. This statement does not imply that primary education spending is irrelevant. It is relevant relative to the typical participation rate; for instance, to calculate the absolute amount of benefit accrued to a decile from public spending on primary education, one might multiply the decile's average primary participation rate by public spending.

However, only the mean utilization rate by decile is statistically significant when BIA uses the normalized equivalent xj. As previously stated, BIA's assumptions are reasonable and produce reliable outcomes. However, a BIA can relax some of these assumptions by slightly modifying expression (2) to account for differences in unit costs caused by user characteristics like their spoken language (e.g., Urdu, Punjabi, Sindhi, Pushto, Balochi, Saraiki, Hindko, Brahvi, etc.), gender, ethnicity, religion, and income level. For these additions, the main change consists of summarizing unit costs by education levels, as before, and discrete categories of spoken language (Demery, 2003).

1.3.7 Empirical Methodology- The Benefit Incidence Analysis across Various Language Groups

Public spending on services varies depending on income and linguistic groups. Public spending on services is typically higher within specific language groups than among other language groups and across various levels of education. Variations in public spending led to variations in benefit distribution, which should be accounted for in the BIA. As a result, subject to data availability, BIA entails estimating:

$$X_j = \sum_{k=1}^{n} \sum_{i=1}^{3} \frac{E_{ijk}}{E_i} S_{ik}$$

Equation 1-4

Where the k subscript denotes the different language, groups specified in the unit spending estimate, n languages are distinguished. The share of the total education Spending (S) accruing to the language group is given by:

$$x_j = \sum_{k=1}^{n} \sum_{i=1}^{3} \frac{E_{ijk}}{E_i} \left(\frac{S_{ik}}{S}\right)$$

Equation 1-5

$$x_j = \sum_{k=1}^{n} \sum_{i=1}^{3} (e_{ijk}) \ (s_{ik})$$

Equation 1-6

Two factors determine this share: the group's share in total enrollments at each level of education and in each language group $(eijk)$, and the share of each level of education and language group in total education spending (sik). The e's reflect individual enrollment decisions, whereas the s's reflect public spending across various language groups and levels of education.

1.3.8 Results and Discussion

This research conducted a comprehensive analysis of the allocation of public spending on education across various education levels and the enrolment status of students at the national and provincial levels by utilizing the BIA. (Asghar & Zahra, 2012). Primarily, the BIA determines per capita public spending on education by dividing the total amount of public spending on education allocated to a specific education level (such as primary, secondary, and higher education) by the total enrolments at each level (national/provincial) resulting in a ratio that represents the amount of spending per student. Furthermore, enrollments at each level are further distributed corresponding to income deciles, and education spending is distributed among these income deciles subject to their share in enrollments at various levels of education. Present analysis entails a robust presupposition that the public spending on education has been equitably distributed among students at the national and provincial level, i.e., it might posit uniformity in the allocation of public spending among all students enrolled in public schools.

1.3.9 Benefit Incident Analysis of Public Education Spending across Various Income Groups

Table 1-2 through Table 1-6 illustrates the results based on BIA. The poorest decile of the population is entitled to 13.22 percent of total public spending at the primary level of education, while the richest decile yields 4.11 percent in Pakistan as a whole. The group with the lowest income receives more significant benefits from public spending on primary education than the group with the highest income. It is contemplated that primary-level public spending primarily benefits the bottom five deciles, comprising 71.17 percent of allocated spending to primary education went to the poorest families, given that most families with higher incomes prefer to send their children to private schools. It is contemplated that primary-level public spending primarily benefits the bottom five deciles, comprising 71.17 percent of allocated spending to primary education went to the poorest families, given that most families with higher incomes prefer to send their children to private schools (Awan & Zia, 2015).

Table 1-2: Benefit Incident Analysis of Public Spending on Education By Various Levels of Education Enrollments and Income Groups in Pakistan

	Primary Education			Secondary Education			Higher Education		
Income Deciles	Enrol. *	Percent Share	Exp.*	Enrol.	Percent Share	Exp.*	Enrol.	Percent Share	Exp.*
1	2204726	13.22	14268.33	453470	5.74	7215.95	19504	1.54	1766.23
2	2151359	12.9	13922.96	498501	6.31	7932.52	16465	1.3	1490.97
3	2067973	12.4	13383.31	628854	7.96	10006.79	21531	1.7	1949.74
4	1934556	11.6	12519.87	633594	8.02	10082.22	34956	2.76	3165.45
5	1834492	11	11872.29	699165	8.85	11125.64	36982	2.92	3348.96
6	1676059	10.05	10846.95	859539	10.88	13677.62	45214	3.57	4094.45
7	1567657	9.4	10145.41	902200	11.42	14356.47	89415	7.06	8097.14
8	1375869	8.25	8904.22	1026232	12.99	16330.17	139696	11.03	12650.35
9	1179078	7.07	7630.64	1081534	13.69	17210.17	230124	18.17	20839.24
10	685433	4.11	4435.92	1116294	14.13	17763.31	632746	49.96	57299.3
Total	16677204	100	107930	7899382	100	125700.85	1266632	100	114701.83

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19)

Note: * Total Public Education Spending (PKR million) at the national level has been allocated to each income decile according to their share in total enrolment

In the context of secondary education in Pakistan,

Table **1-2** represents a comparison based on income deciles, which unveils that the proportion of public education spending for the lowest decile is 5.74 percent. In contrast, the highest decile accounts for 14.13 percent. Significant disparities exist in the allocation

of public education spending towards secondary education. The highest 10 percent of the population received a considerable proportion of total public spending on secondary education. (Corak, 2013). Notably, the upper three income deciles collectively shared 40.81 percent of the total public spending; in contrast, the lowest 30 percent of the population only received 20.01 percent of the total spending on secondary education. Furthermore, in higher education in Pakistan, the proportion of public education spending for the lowest income decile is 1.54 percent, while the highest income decile accounts for 49.96 percent. Considerable disparities exist in the distribution of public spending for higher education, which is at its highest across all educational levels in Pakistan. (Sajjad et al., 2022).

Furthermore, this research conducted a comprehensive analysis of the allocation of public spending on education across various education levels and the enrolment status of students at the provincial level. The method for determining per capita public spending on education and all assumptions remain the same as of analysis at the national level.

Table 1-3: Benefit Incident Analysis of Public Spending on Education By Various Levels of Education Enrollments and Income Groups in Punjab

	Primary Education			Secondary Education			Higher Education		
Income Deciles	Enrol. *	Percent Share	Exp.*	Enrol.	Percent Share	Exp.*	Enrol.	Percent Share	Exp.*
1	991530	11.7	485.73	192613	4.4	1572.8	3854	1	352.81
2	1114802	13.2	546.11	230468	5.3	1881.9	2569	0.7	235.2
3	1025028	12.1	502.14	325104	7.5	2654.66	4496	1.2	411.61
4	964732	11.4	472.6	305063	7	2491.02	10919	2.9	999.62
5	889697	10.5	435.84	366299	8.4	2991.04	7708	2	705.61
6	865579	10.2	424.03	457595	10.5	3736.53	13489	3.6	1234.82
7	771786	9.1	378.08	476522	11	3891.08	28262	7.5	2587.24
8	736948	8.7	361.01	611240	14.1	4991.13	49458	13.1	4527.67
9	653874	7.7	320.32	660228	15.2	5391.15	64232	17	5880.09
10	458248	5.4	224.48	723690	16.6	5909.35	192053	50.9	17581.48
Total	8472224	100	4150.33	4348822	100	35510.65	377040	100	34516.15

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19)

Note: * Total Public Education Spending (PKR million) at the national level has been allocated to each income decile according to their share in total enrolment

Table 1-4: Benefit Incident Analysis of Public Spending on Education by Various Levels of Education Enrollments and Income Groups in KP

	Primary Education			Secondary Education			Higher Education		
Income Deciles	Enrol. *	Percent Share	Exp.*	Enrol.	Percent Share	Exp.*	Enrol.	Percent Share	Exp.*
1	488951	14.5	336.2	126419	9.2	183.83	2647	2.7	750.37
2	318410	9.4	218.94	103819	7.5	150.96	1324	1.4	375.19
3	436704	13	300.27	119357	8.7	173.56	3971	4.1	1125.56
4	365728	10.9	251.47	120769	8.8	175.61	2978	3.1	844.17
5	390372	11.6	268.42	129950	9.4	188.96	3309	3.4	937.96
6	336154	10	231.14	157494	11.4	229.01	3640	3.7	1031.76
7	375585	11.1	258.25	173032	12.6	251.61	7611	7.8	2157.32
8	280950	8.3	193.18	145488	10.6	211.56	7942	8.1	2251.12
9	239547	7.1	164.71	153963	11.2	223.88	17538	18	4971.21
10	137025	4.1	94.22	146194	10.6	212.58	46659	47.8	13225.31
Total	3369425	100	2316.78	1376486	100	2001.57	97619	100	27669.96

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19)

Note: * Total Public Education Spending (PKR million) at the national level has been allocated to each income decile according to their share in total enrolment

Table 1-5: Benefit Incident Analysis of Public Spending on Education by Various Levels of Education Enrollments and Income Groups in Sindh

	Primary Education			Secondary Education			Higher Education		
Income Deciles	Enrol. *	Percent Share	Exp.*	Enrol.	Percent Share	Exp.*	Enrol.	Percent Share	Exp.*
1	506646	16.99	13302.26	78364	5.4	3552.78	656	0.38	141.32
2	438153	14.69	11503.94	95881	6.61	4346.92	4591	2.63	989.21
3	403907	13.54	10604.79	118929	8.2	5391.86	1312	0.75	282.63
4	365631	12.26	9599.84	122617	8.45	5559.05	3935	2.26	847.89
5	322320	10.81	8462.67	117086	8.07	5308.26	5902	3.38	1271.84
6	281022	9.42	7378.39	139212	9.59	6311.4	6558	3.76	1413.15
7	247783	8.31	6505.68	158573	10.93	7189.14	5902	3.38	1271.84
8	219580	7.36	5765.2	198216	13.66	8986.43	18363	10.53	3956.83
9	142022	4.76	3728.86	194528	13.41	8819.24	33447	19.17	7207.08
10	55399	1.86	1454.52	227718	15.69	10323.95	93783	53.76	20208.09
Total	2982464	100	78306.16	1451124	100	65789.03	174449	100	37589.88

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19)

Note: * Total Public Education Spending (PKR million) at the national level has been allocated to each income decile according to their share in total enrolment

Table 1-6: Benefit Incident Analysis of Public Spending on Education by Various Levels of Education Enrollments and Income Groups in Baluchistan

	Primary Education			Secondary Education			Higher Education		
Income Deciles	Enrol. *	Percent Share	Exp.*	Enrol.	Percent Share	Exp.*	Enrol.	Percent Share	Exp.*
1	67326	9.19	2127.91	12009	4.5	1007.59	1474	4.7	701.85
2	118315	16.15	3739.48	20448	7.7	1715.63	369	1.2	175.46
3	74256	10.14	2346.95	21746	8.1	1824.56	0	0	0
4	94553	12.91	2988.46	27264	10.2	2287.51	737	2.4	350.93
5	89108	12.16	2816.35	29211	10.9	2450.91	1843	5.9	877.32
6	78712	10.74	2487.77	36677	13.7	3077.25	737	2.4	350.93
7	64356	8.78	2034.03	31483	11.8	2641.53	4055	12.9	1930.09
8	57920	7.91	1830.62	33106	12.4	2777.69	2580	8.2	1228.24
9	64851	8.85	2049.67	35054	13.1	2941.09	7372	23.5	3509.26
10	23267	3.18	735.38	20123	7.5	1688.4	12165	38.8	5790.28
Total	732664	100	23156.62	267122	100	22412.17	31333	100	14914.36

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19)

Note: * Total Public Education Spending (PKR million) at the national level has been allocated to each income decile according to their share in total enrolment

In Punjab, as presented in Table 1-3, the primary level public spending on education exhibits a proportion of 11.7 percent for the lowest decile and 5.4 percent for the highest income decile, implying that the allocation of public primary education spending in Punjab exhibits a pro-poor preference. (Naveed & Sutoris, 2020) . The finding corroborates the supply-side prospect that public primary education spending is advantageous for the poorest members of society and that the government primarily must provide education at this level to individuals where the market fails to provide for the poorest individuals' public primary education spending. (Klees, 2008; Van de Walle, 1995).

At the secondary level, public spending is allocated at a rate of 4.4 percent for the lowest-income group and 16.6 percent for the highest-income group. At the higher education level, the proportion of individuals belonging to the lowest decile is 1 percent, while the percentage of those in the highest decile is 50.9 percent. Public higher education spending distribution is highly skewed towards the upper three income deciles, which collectively receive approximately 81 percent of the total public higher education spending. In contrast, the remaining 19 percent of the allocation is distributed among the lowest 70 percent of the population. During the fiscal year 2019/20, the public education spending comprised PKR 4150.33 million for primary education. Notably, public spending on

education was distributed unequally among different deciles in favor of the poor, in which the poorest decile received a more significant proportion of PKR 485.73 million. In contrast, the richest decile received a comparatively less PKR 224.48 million. The allocated proportion of public education spending towards secondary education is PKR 35510.65 million. It is essential to highlight that public spending on education demonstrated massive inequality in resource distribution among population deciles, with only PKR 1572.8 million allocated for the poorest decile. In contrast, the richest decile received a higher allocation of PKR 5909.35 million.

Table 1-4 illustrates the BIA estimation in KP; the primary education sector exhibits a distribution where the lowest and highest deciles account for 14.5 and 4.1 percent, respectively. The distribution of primary education spending reveals that 70 percent of the low-income population accounts for approximately 80.5 percent of the total spending, while the highest 30 percent shares the remaining 19.5 percent. At the secondary level, the highest 10 percent of individuals receive 10.6 percent of the total public spending on higher education, while the lowest 10 percent receive 9.2 percent. There is a significant disparity in public spending on higher education, with the lowest decile receiving just 2.7 percent and the highest decile receiving a substantial share of 47.8 percent.

In the province of Sindh, as indicated in Table 1-5, the lower five income deciles contribute to 68.29 percent of the overall primary education spending. In contrast, the upper 50 percent of the population contributes 31.71 percent of the same public spending. The allocation of public spending on education towards higher education in Sindh exhibits a significant inequality, as evidenced by 0.38 percent of students enrolled in higher education belong to the lowest decile, while a substantial 53.76 percent of enrollments are from the highest decile. According to Table 1-6, in Baluchistan, the lowest 10 percent of the population receives 9.19 percent of the primary education spending, while the highest 10 percent receives 3.18 percent. The allocation of public spending on education for secondary education is divided between the lowest and highest 10 percent income groups in a ratio of 4.5 to 7.5, with the former representing the lower decile and the latter representing the upper decile. At the higher education level, this share is 4.7 and 38.8 percent for the top and bottom deciles, respectively.

Table 1-2 through Table 1-6. It is elaborated that as income levels increase, the percentage of individuals enrolled in primary education declines because many people choose to send their children to private schools, to maintain their social status. Thus, there is a reduction in government spending as enrollment is described in income deciles. The BIA is based on the benefits accrued to each group because each group is utilizing the provided service. The higher the utilization rate of the provided service, the BIA represents more benefits accrued to that group. (Davoodi et al., 2010; Lanjouw & Ravallion, 1999; Younger, 2003a). Figure 1-13 indicates that as an individual move with higher income deciles, only 4.11 percent of the total population belonging to the upper decile are currently enrolled in primary education, which represents an insignificant proportion of the overall percentage. Figure 1-13 demonstrates the decile-wise enrollment distribution at primary, secondary, and higher levels of education. This figure summarizes the statistics estimated and elaborated in

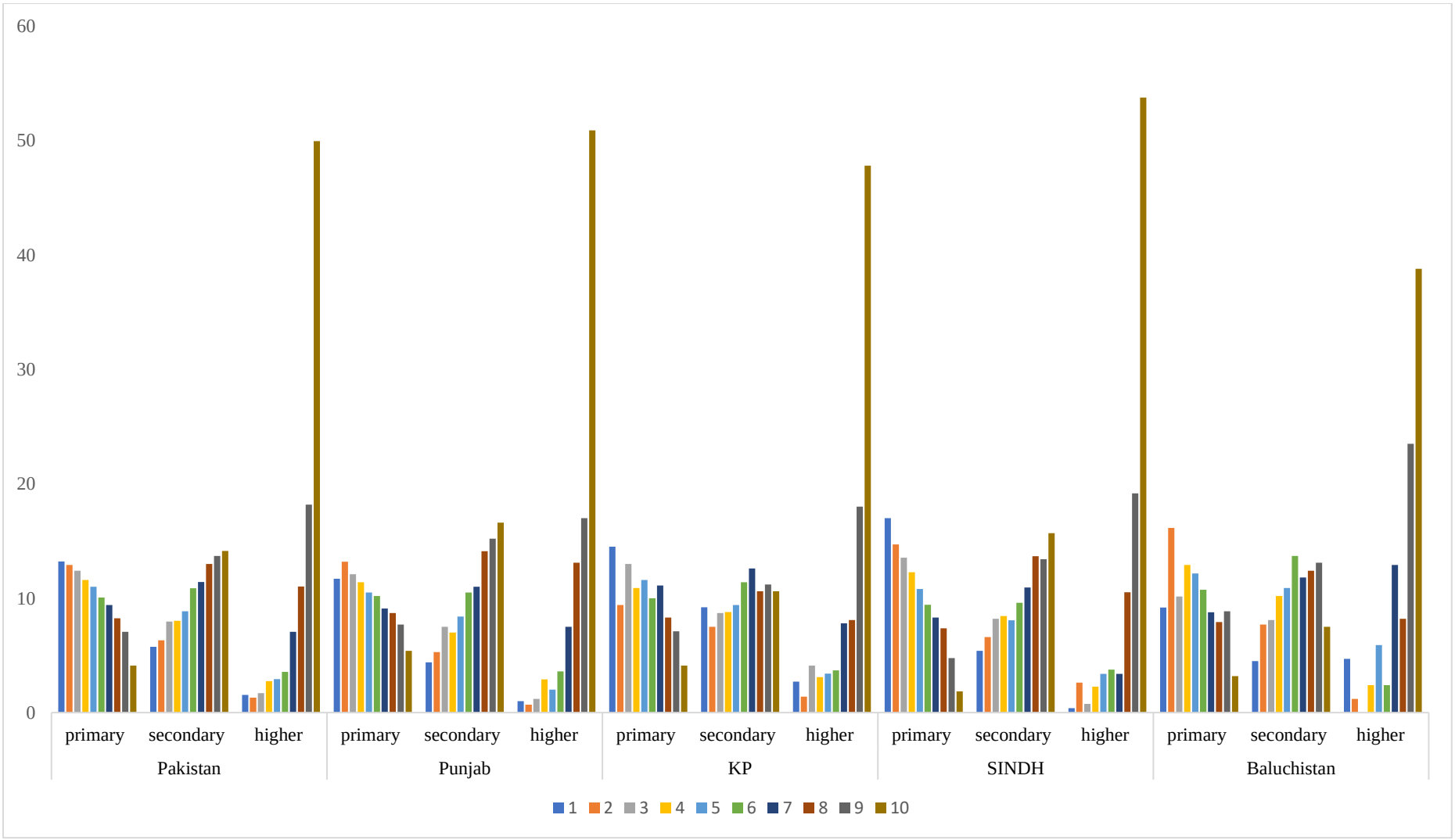


Figure 1-13: Benefit Incident Analysis of Distribution of Educating Enrollments by Education Levels across Regions

In Pakistan, low enrollment levels might be attributed to this class-based education system; individuals believe that government-provided education is substandard, leading them to seek alternative educational opportunities elsewhere to develop a robust understanding of academic concepts for long-term gains. Moreover, public schools are more accessible to low-income families due to location, cost, and availability. Consequently, with a limited enrollment percentage, the government allocated a smaller proportion of the budget. Figure 1-13 exhibited the same trend for Pakistan and provinces among primary, secondary, and higher education enrollments across various income deciles.

As far as secondary education is concerned, it reveals that as the income level increases, people's enrollment in secondary education at public schools also increases because of increasing private school education costs at the secondary level (Haveman & Smeeding, 2006; Naveed & Sutoris, 2020). Many children and high education costs push them to choose private schools. Low-income families consider education less critical due to a lack of awareness, so they prefer to prepare their children for earning instead of sending them to schools. Due to this high proportion enrollment of high-income people, public spending on education shares increases in secondary education more than primary education (James, 1993). A similar association between the decile-wise distribution of enrollments across Pakistan and provinces is observed among primary, secondary, and higher education.

Moving to enrollment in higher education, which demonstrated a declining trend in education enrolment as an individual to the higher income decile. Higher education represents a considerable disparity in enrollments among individuals at the poorest and richest deciles. Lack of awareness and a lower proportion (1.54 percent) of low-income families sent their children for higher education. As the income level increases, people become aware of higher education's importance and send their children to government rather than private institutes. It is revealed from the given data that among the richest deciles, 68 percent of people are enrolled in high education. (Saher et al., 2023; Soomro et al., 2020; Van de Walle, 1995).

Access to higher education is hindered for a substantial percentage of the population, particularly those from rural and poor backgrounds, due to various institutional, sociocultural, and economic obstacles. Insufficient accessibility to academic institutions is

a crucial element that contributes to reduced enrollment rates in higher education. Additionally, socioeconomic deprivation leads to poverty, which challenges low-income families to provide financial support for their children's educational requirements. Furthermore, in Pakistan, a preference for male children when pursuing higher education within families illustrates gender disparities, especially in higher education, due to limited financial means. Insufficient accessibility to academic institutions is a crucial element that contributes to reduced enrollment rates in higher education (Haveman & Smeeding, 2006; McDonough, 1994).

Additionally, socioeconomic deprivation leads to poverty, which challenges low-income families to provide financial support for their children's educational requirements. Furthermore, in Pakistan, a preference for male children when pursuing higher education within families illustrates gender disparities, especially in higher education, due to limited financial means (Qureshi, 2012; Robeyns, 2003; Ullah & Skelton, 2013). The high cost of tuition fees, coupled with the expenses associated with living at reputable public and private academic institutions and the lack of financial assistance, impede individuals from low-income backgrounds who aspire to pursue higher education. In contrast, rich individuals have greater access to higher education in Pakistan, as they can more easily afford tuition fees and other associated costs. In addition, they have a greater understanding of the job market, which gives them an advantage over those with less education when competing for jobs in a society where the wealthy have higher incomes and economic opportunities. (Allen et al., 2013).

More significant barriers to getting higher enrolment rates are language barriers in education in Pakistan, which are often overlooked; however, they are an essential factor in creating an enduring culture of educational inequality in which many people do not have access to educational incentives but often face cultural barriers preventing them from advancing their educational growth. A significant portion of students in Pakistan is not taught in their native language, which may hinder their comprehension and learning of any subject to a great extent (Brock-Utne, 2001a; MananDavidDumanig, 2015); additionally, due to the lack of resources, instructors cannot provide adequate help and advice to students with a language barrier. Moreover, language barriers are not limited to the classrooms; for instance, most of the students in Pakistan come from disadvantaged backgrounds, and they face additional obstacles such as poverty, poor access to resources, and lack of technology,

perpetuating the educational gap in the country and makes it hard for marginalized groups to get an education in their mother language (Rahman, 1995, 2004; Ramanathan, 2005).

1.3.10 Benefit Incident Analysis of Public Education Spending across Various Language Groups

Based on the distribution of public education spending across various income groups, this research presented a comprehensive analysis of the allocation of public spending on education across various language speakers at various education levels and across various income groups at national and provincial levels. This research has utilized BIA, which primarily determines per capita public spending on education, which is assumed to be allocated equally per capita at each level (such as primary, secondary, and higher education). Table 1-7 through Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19) and Pakistan population census data (2017).

Table 1-11 demonstrated the distribution of public education spending by level of education, income, and language groups.

In Pakistan, it is estimated that 1,561,17 individuals speaking Urdu as their mother language are enrolled in primary education among the lowest decile, and the public spending allocated to this group is 1,010.34 million of the total public spending on primary education. As people now prefer private schools to maintain prestige, enrollment declines as income levels rise. (Bangay, 2005). People with Punjabi as their mother language comprise 854954 enrollments in the lowest income decile, sharing PKR 5533 million. In contrast, 265799 Punjabi-speaking individuals are enrolled in primary education in the richest decile, sharing 1720.17 million of the total public spending on primary education. Punjabi-speaking individuals comprise the most significant proportion of the population; therefore, the same statistics can be shown for Punjabi-speaking enrollments. However, as their incomes rise, their enrollment decreases, as people prefer private schools, and public spending gradually declines. However, Punjabi language-based enrollments are higher than other language speakers in Pakistan; consequently, a significant share of public spending is allocated toward Punjabi language speakers' enrollment. Comparative analysis reveals that the public spends more on education for Pushto, Balochi, and Saraiki than their respective enrollments. It is reported that educational provision is costly where people reside primarily in hilly and undeveloped areas, necessitating the movement of more

resources from developed areas, which incurs transportation costs, necessitating that the government allocates more funds to provide education in those areas that incur higher costs (Kousar et al., 2023).

Table 1-7: Benefit Incident Analysis of Public Spending on Education by Levels of Education Enrollments, Language, and Income Group in Pakistan

Income decile	Urdu		Punjabi		Sindhi		Pushto		Balochi		Saraiki		Hindko		Brahvi		Others	
Primary Education																		
	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.
1	156117	1010.34	854954	5533	321194	2078.67	402182	2602.8	66678	431.52	268840	1739.85	53778	348.04	27258	176.4	53726	347.7
2	152338	985.89	834259	5399.07	313419	2028.35	392447	2539.8	65064	421.08	262332	1697.74	52476	339.61	26598	172.13	52426	339.28
3	146433	947.67	801923	5189.81	301271	1949.74	377236	2441.36	62543	404.76	252164	1631.93	50442	326.45	25567	165.46	50394	326.13
4	136986	886.53	750186	4854.98	281834	1823.95	352898	2283.85	58508	378.64	235896	1526.65	47188	305.39	23918	154.79	47142	305.09
5	129901	840.68	711383	4603.86	267257	1729.6	334645	2165.72	55481	359.06	223694	1447.68	44747	289.59	22680	146.78	44704	289.31
6	118682	768.07	649946	4206.25	244175	1580.23	305744	1978.68	50690	328.05	204375	1322.66	40883	264.58	20722	134.1	40843	264.33
7	111006	718.4	607909	3934.21	228383	1478.03	285969	1850.71	47411	306.83	191157	1237.11	38239	247.47	19381	125.43	38202	247.23
8	97425	630.51	533538	3452.9	200442	1297.2	250984	1624.29	41611	269.29	167771	1085.76	33560	217.19	17010	110.09	33528	216.98
9	83491	540.33	457226	2959.03	171773	1111.66	215085	1391.97	35659	230.78	143774	930.46	28760	186.13	14577	94.34	28732	185.95
10	48536	314.11	265799	1720.17	99857	646.24	125035	809.19	20730	134.16	83580	540.91	16719	108.2	8474	54.84	16703	108.1
Total	1180914	7642.52	6467122	41853.28	2429605	15723.68	3042224	19688.37	504375	3264	2033584	13160.75	406793	2632.64	206186	1334.37	406400	2630.1
Secondary Education																		
1	32110	510.96	175848	2798.22	66063	1051.25	82721	1316.32	13714	218.23	55295	879.9	11061	176.01	5606	89.21	11050	175.84
2	35299	561.7	193310	3076.09	72624	1155.64	90936	1447.03	15076	239.91	60786	967.27	12160	193.49	6163	98.07	12148	193.3
3	44529	708.58	243858	3880.45	91614	1457.83	114714	1825.42	19019	302.64	76681	1220.21	15339	244.09	7775	123.72	15324	243.85
4	44865	713.92	245696	3909.7	92305	1468.82	115579	1839.18	19162	304.92	77259	1229.4	15455	245.93	7833	124.65	15440	245.69
5	49508	787.81	271124	4314.32	101857	1620.83	127540	2029.52	21145	336.48	85255	1356.64	17054	271.38	8644	137.55	17038	271.12
6	60864	968.51	333314	5303.94	125221	1992.61	156795	2495.05	25995	413.66	104810	1667.82	20966	333.63	10627	169.1	20946	333.3
7	63885	1016.58	349857	5567.18	131436	2091.51	164578	2618.88	27286	434.19	110012	1750.6	22007	350.19	11154	177.49	21985	349.85
8	72668	1156.34	397955	6332.55	149506	2379.05	187203	2978.92	31037	493.88	125137	1991.27	25032	398.33	12688	201.9	25008	397.94
9	76583	1218.65	419399	6673.8	157562	2507.25	197291	3139.45	32709	520.49	131880	2098.57	26381	419.79	13371	212.78	26355	419.39
10	79045	1257.82	432879	6888.29	162626	2587.83	203632	3240.35	33761	537.22	136119	2166.02	27229	433.29	13801	219.61	27203	432.87
Total	559356	8900.88	3063239	48744.55	1150815	18312.63	1440990	22930.11	238904	3801.62	963234	15327.7	192683	3066.12	97663	1554.08	192497	3063.15
Higher Education																		
1	1381	125.07	7563	684.91	2841	257.31	3558	353.16	590	53.42	2378	215.37	476	43.08	241	21.84	475	43.04
2	1166	105.58	6385	578.17	2399	217.21	3003	298.12	498	45.09	2008	181.81	402	36.37	204	18.43	401	36.33
3	1525	138.06	8349	756.07	3137	284.05	3928	389.85	651	58.97	2625	237.75	525	47.56	266	24.11	525	47.51
4	2475	224.15	13555	1227.51	5092	461.16	6377	632.93	1057	95.73	4262	385.99	853	77.21	432	39.14	852	77.14
5	2619	237.14	14341	1298.67	5388	487.89	6746	669.63	1118	101.28	4510	408.37	902	81.69	457	41.4	901	81.61
6	3202	289.93	17533	1587.75	6587	596.5	8248	818.69	1367	123.83	5513	499.27	1103	99.87	559	50.62	1102	99.78
7	6331	573.36	34674	3139.93	13026	1179.63	16311	1619.03	2704	244.88	10903	987.35	2181	197.51	1105	100.11	2179	197.32
8	9892	895.77	54171	4905.58	20351	1842.96	25483	2529.44	4225	382.59	17034	1542.56	3407	308.57	1727	156.4	3404	308.27
9	16295	1475.63	89238	8081.08	33525	3035.95	41979	4166.82	6960	630.25	28061	2541.09	5613	508.31	2845	257.64	5608	507.82
10	44805	4057.37	245368	22219.65	92181	8347.6	115424	11457.03	19136	1732.93	77156	6986.96	15434	1397.65	7823	708.41	15419	1396.3
Total	89690	8122.04	491177	44479.32	184528	16710.25	231057	22934.7	38307	3468.97	154450	13986.51	30896	2797.83	15660	1418.1	30866	2795.12

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19) and Pakistan population census data (2017).

Moreover, in pursuant 321194, Sindhi-speaking individuals are enrolled in the lowest decile of the population with 2078.67 million public spending in Pakistan. In addition, 402182 Pushto speaking enrollments with 2602.8 million of public spending, 66678 Balochi speaking enrollments with 431.52 million of public spending, 268840 Saraiki speaking enrollments with 1739.85 million of public spending, 53778 Hindko speaking enrollments 348.04 million of public spending, 27258 Brahvi speaking enrollments 176.4 million public spending in Pakistan in the lowest income deciles at the primary level of education. In the highest income decile, 48536 Urdu language speakers are enrolled at the primary level of education, and 314.11 million spending is allocated to this group. Moreover, 265799, 99857, 125035, 20730, 83580, 16719, and 8474 individuals are enrolled in the richest deciles of the population among Punjabi, Sindhi, Pushto, Balochi, Saraiki, Hindko, and Brahvi language speakers respectively in Pakistan.

The data relating to secondary education indicates a lower enrollment of individuals at the lowest low-income backgrounds among Urdu language speakers; however, the lowest benefits accrued to this specific group. Moreover, 32110, 175848, 66063, 82721, 13714, 55295, 11061, 5606, and 11050 students are enrolled among Urdu, Punjabi, Sindhi, Pushto, Balochi, Saraiki, Hindko, Brahvi, and other language speakers in lowest income decile. Similarly, for the richest people, 79045, 136119, 27229, 432879, 162626, 203632, 33761, 13801, and 7203 individuals are enrolled among Urdu, Punjabi, Sindhi, Pushto, Balochi, Saraiki, Hindko, Brahvi, and other language speakers in secondary education showing a disparity in educational enrollments. A lower enrollment level across the lowest income decile may be attributed to inadequate awareness, insufficient alternative resources, and many familial obligations. Additionally, it is reasonable to argue that individuals perceive education as less significant and look for informal employment to support financials in households due to a higher dependency ratio (Alderman et al., 2001). Punjabis with lower incomes exhibit a higher enrollment rate in secondary education and benefit more from public spending on education. One of the primary factors contributing to this significant enrollment is the substantial proportion of the population in Pakistan (Ahmad & Guijun, 2022).

The allocation of public spending on secondary education in Brahvi is comparatively lower, owing to their limited enrollment in public secondary education, which is attributed to their minor population or preference for private educational institutions. As the income level rises, it exhibits a corresponding increase in enrollment in

public secondary education, resulting in a more significant benefit of public education spending accrued to higher income groups. This phenomenon may be attributed to the high tuition fees and additional expenses associated with private institutions, leading individuals to favor public schools. Upon comparing the top 10 percent of all languages, the provided data indicates that Punjabi has a higher enrollment rate than other languages. The low enrolment of Balochi's individuals may be attributed to their adherence to traditional values, which may discourage girls' education at the secondary level, hence, inadequately benefitting from public education spending.

Table 1-7 indicates that Punjabi language speakers with lower incomes exhibit a higher enrollment at higher education in public institutions than speakers of other languages. The allocation of public spending on education is skewed towards higher-income groups, which comprise 684.91 million to this group. As the income level of individuals rises, there is a corresponding increase in the enrollment of all languages for higher education in public institutes. However, this trend is more evident among Punjabi-speaking enrollments, resulting in a corresponding increase in benefits of public education spending accrued to this group. , The allocation of public spending towards the Pushto language appears to be relatively higher than that of enrollments of other language speakers, which is attributed to the fact that these areas are considered underdeveloped and, therefore, require a more significant influx of resources from more developed regions, resulting in significant total expenditures (Bizenjo, 2020; Jimenez & Tan, 1987).

Furthermore, socio-cultural barriers in Pushto language speakers and cultural values may discourage girls from enrolling in schools, reducing educational access and opportunities for Pashto language speakers. (Khan, 2016). In addition, language barriers can also affect access to education, as many individuals might not be proficient in the national language, Urdu, or English, often used in higher education. Language barriers to education may be more pronounced in certain regions, leading to disparities in enrolment rates among various language groups (Altbach, 2008; MananDavidDumanig, 2015).

Consequently, overall enrollments among various Punjabi, Saraiki, Sindhi, Pashto, and Balochi language speakers in Pakistan are lower compared to other languages for a variety of reasons. The most prominent factor is a lack of educational infrastructure, and these communities, especially in remote areas, lack access to essential educational resources such as trained educators. Thus, many students from these remote communities

cannot obtain the necessary resources to excel in their studies. Additionally, due to inadequate resources, many of the teachers from these areas cannot adequately prepare their students for the exams and are typically not equipped with the latest teaching methods (Haidar & Fang, 2019; Panezai & Channa, 2017). Furthermore, the education system in Pakistan is not tailored to serving the Punjabi, Saraiki, Sindhi, Pashto, and Balochi language speakers because these languages have not achieved official language status. Without recognizing these languages in the education system, the students of these communities do not feel recognized, resulting in a lower enrollment rate. Without recognizing these languages in the education system, the students of these communities do not feel recognized, resulting in a lower enrollment rate (Bizenjo, 2020).

The province of Punjab in Pakistan encompasses a significant portion of the country's population. BIA presented in Table 1-8 indicates that a substantial number of low-income individuals are enrolled in public schools at the primary level. Consequently, the poorest decile receives more benefits from public spending, which is required to support the standard of education at a primary level of education. However, as individuals' income levels increase, their enrollment in public schools' declines, and people prefer to send their children to other private schools for their social standing and to sustain their educational foundation. However, the total enrollment rate is low at each educational among various language groups in which language of instruction plays a significant role, and students are not offered instructions in primary education.

In contrast, in Punjab, this behavior is subject to change as individuals' enrollment in public secondary schools increases with a rise in income levels due to the high costs associated with private education and other related expenses. The lower enrollment rates among individuals from low-income backgrounds may be attributed to language barriers and a perceived lack of necessity for education, as they may prioritize preparing their children for immediate earning opportunities (Rahman, 2007; Ramanathan, 2005; Shamim, 2008; Tamim, 2021). A similar pattern is observed in higher education within the public sector. The findings indicate that within the group comprising more than 20 percent, 67.9 percent of individuals are registered in public schools, spending 23461.57 million over a year.

Table 1-8: Benefit Incident Analysis of Public Spending on Education by Levels of Education Enrollments, Language, and Income Group in Punjab

	Urdu		Punjabi		Sindhi		Pushto		Balochi		Saraiki		Hindko		Brahvi		Others	
	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.
Primary Education																		
1	48271	23.65	690793	338.40	1530	0.75	19635	9.62	8257	4.04	205073	100.46	5828	2.86	293	0.14	11852	5.81
2	54272	26.59	776675	380.47	1720	0.84	22076	10.81	9283	4.55	230568	112.95	6553	3.21	329	0.16	13325	6.53
3	49902	24.45	714130	349.83	1581	0.77	20298	9.94	8536	4.18	212001	103.85	6025	2.95	303	0.15	12252	6.00
4	46966	23.01	672123	329.26	1488	0.73	19104	9.36	8034	3.94	199530	97.74	5671	2.78	285	0.14	11531	5.65
5	43313	21.22	619846	303.65	1373	0.67	17618	8.63	7409	3.63	184011	90.14	5229	2.56	263	0.13	10634	5.21
6	42139	20.64	603043	295.42	1335	0.65	17141	8.40	7208	3.53	179023	87.70	5088	2.49	256	0.13	10346	5.07
7	37573	18.41	537698	263.40	1191	0.58	15284	7.49	6427	3.15	159624	78.20	4536	2.22	228	0.11	9225	4.52
8	35877	17.58	513427	251.52	1137	0.56	14594	7.15	6137	3.01	152419	74.67	4332	2.12	218	0.11	8809	4.32
9	31833	15.59	455550	223.16	1009	0.49	12949	6.34	5445	2.67	135237	66.25	3843	1.88	193	0.09	7816	3.83
10	22309	10.93	319258	156.40	707	0.35	9075	4.45	3816	1.87	94777	46.43	2694	1.32	135	0.07	5477	2.68
Total	412456	202.05	5902544	2891.51	13071	6.40	167774	82.19	70550	34.56	1752262	858.39	49798	24.39	2501	1.23	101267	49.61
Secondary Education																		
1	9377	76.57	134192	1095.76	297	2.43	3814	31.15	1604	13.10	39837	325.29	1132	9.24	57	0.46	2302	18.80
2	11220	91.62	160565	1311.11	356	2.90	4564	37.27	1919	15.67	47666	389.22	1355	11.06	68	0.56	2755	22.49
3	15827	129.24	226498	1849.49	502	4.10	6438	52.57	2707	22.11	67239	549.05	1911	15.60	96	0.78	3886	31.73
4	14852	121.27	212536	1735.48	471	3.84	6041	49.33	2540	20.74	63095	515.20	1793	14.64	90	0.74	3646	29.77
5	17833	145.61	255198	2083.84	565	4.61	7254	59.23	3050	24.91	75759	618.62	2153	17.58	108	0.88	4378	35.75
6	22277	181.91	318803	2603.21	706	5.76	9062	73.99	3810	31.11	94642	772.81	2690	21.96	135	1.10	5470	44.66
7	23199	189.43	331990	2710.89	735	6.00	9436	77.05	3968	32.40	98556	804.77	2801	22.87	141	1.15	5696	46.51
8	29757	242.98	425847	3477.29	943	7.70	12104	98.84	5090	41.56	126419	1032.29	3593	29.34	180	1.47	7306	59.66
9	32142	262.46	459977	3755.98	1019	8.32	13074	106.76	5498	44.89	136551	1115.02	3881	31.69	195	1.59	7892	64.44
10	35232	287.69	504190	4117.01	1117	9.12	14331	117.02	6026	49.21	149677	1222.20	4254	34.73	214	1.74	8650	70.63
Total	211715	1728.78	3029796	24740.04	6710	54.79	86119	703.21	36213	295.70	899442	7344.47	25562	208.73	1284	10.48	51981	424.45
Higher Education																		
1	188	17.18	2685	245.80	6	0.54	76	7.19	32	2.94	797	72.97	23	2.07	1	0.10	46	4.22
2	125	11.45	1790	163.86	4	0.36	51	4.79	21	1.96	531	48.65	15	1.38	1	0.07	31	2.81
3	219	20.04	3132	286.76	7	0.64	89	8.39	37	3.43	930	85.13	26	2.42	1	0.12	54	4.92
4	532	48.66	7607	696.43	17	1.54	216	20.37	91	8.32	2258	206.74	64	5.88	3	0.30	131	11.95
5	375	34.35	5370	491.59	12	1.09	153	14.38	64	5.88	1594	145.94	45	4.15	2	0.21	92	8.43
6	657	60.12	9397	860.29	21	1.91	267	25.16	112	10.28	2790	255.39	79	7.26	4	0.36	161	14.76
7	1376	125.96	19690	1802.51	44	3.99	560	52.71	235	21.54	5845	535.10	166	15.21	8	0.76	338	30.92
8	2408	220.42	34457	3154.40	76	6.99	979	92.24	412	37.70	10229	936.43	291	26.61	15	1.34	591	54.12
9	3127	286.26	44750	4096.62	99	9.07	1272	119.80	535	48.96	13285	1216.15	378	34.56	19	1.74	768	70.28
10	9350	855.93	133802	12248.90	296	27.13	3803	358.19	1599	146.40	39721	3636.28	1129	103.34	57	5.19	2296	210.15
Total	18356	1680.36	262681	24047.18	582	53.25	7466	703.21	3140	287.42	77981	7138.78	2216	202.88	111	10.19	4507	412.57

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19) and Pakistan population census data (2017).

The primary rationale behind the substantial allocation of public spending on education towards the education of Punjabi speakers is its comparatively higher enrollment rate concerning other language-based enrolments. The enrollment of Sindhi language speakers in Punjab is relatively low, attributed to language diversity and the low population proportion. Consequently, public education spending towards Balochi, Sindhi, Hindko, Brahvi, and other languages has resulted in a relatively lower allocation of public education spending toward their education in Punjab. The Saraiki language speakers constitute a significant portion of Punjab's population; therefore, considerable public spending is allocated towards their primary education. (Alderman et al., 2001; Malik, 2015).

The public spending on secondary education reveals a different setting for each language group: as incomes rise, so does enrollment in public institutions, which is directly proportional to public spending. The BIA Punjab illustrates that among the top 10 percent of Punjab's population, 504190 students are enrolled with public education spending of 1.74 million at the secondary level of education. Brahvi, Balochi, and Pushto enrollment are lower due to their cultural tendency to view education, preventing their girls from attending school (Anwar et al., 2022; Jamal, 2016).

A similar pattern is observed in higher education regarding language-based enrollment. Individuals with limited financial resources and language of instruction hinder individuals from pursuing formal education. Furthermore, in particular linguistic contexts, as income levels increase, there is a corresponding increase in enrollment for public higher education, which is associated with higher benefits in public spending (Birdsall, 1996; Bizenjo, 2020). The allocation of significant public spending on education towards public education in Punjab may be attributed to the comparatively higher enrollment rates of Punjabi language speakers in Punjab higher education. On the contrary, allocating public spending on education toward education for Sindhi students may contemplate relatively lower enrollment rates, which could be attributed to most of them not pursuing higher education in Punjab (Habib, 2013)

Table 1-9: Benefit Incident Analysis of Public Spending on Education by Levels of Education Enrollments, Language, and Income Group in KP

Income deciles	Urdu		Punjabi		Sindhi		Pushto		Balochi		Saraiki		Hindko		Brahvi		Others	
	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.
Primary Education																		
1	4393	3.02	2633	1.81	434	0.30	375822	258.41	379	0.26	18197	12.51	56126	38.59	1001	0.69	29967	20.60
2	2861	1.97	1715	1.18	282	0.19	244739	168.28	247	0.17	11850	8.15	36550	25.13	652	0.45	19515	13.42
3	3923	2.70	2352	1.62	387	0.27	335664	230.80	339	0.23	16252	11.17	50128	34.47	894	0.61	26765	18.40
4	3286	2.26	1970	1.35	324	0.22	281109	193.29	284	0.19	13611	9.36	41981	28.87	748	0.51	22415	15.41
5	3507	2.41	2102	1.45	346	0.24	300052	206.31	303	0.21	14528	9.99	44810	30.81	799	0.55	23925	16.45
6	3020	2.08	1810	1.24	298	0.21	258378	177.66	261	0.18	12510	8.60	38586	26.53	688	0.47	20602	14.17
7	3374	2.32	2023	1.39	333	0.23	288686	198.50	291	0.20	13978	9.61	43113	29.64	769	0.53	23019	15.83
8	2524	1.74	1513	1.04	249	0.17	215946	148.48	218	0.15	10456	7.19	32250	22.17	575	0.40	17219	11.84
9	2152	1.48	1290	0.89	212	0.15	184123	126.60	186	0.13	8915	6.13	27497	18.91	490	0.34	14681	10.09
10	1231	0.85	738	0.51	122	0.08	105321	72.42	106	0.07	5100	3.51	15729	10.81	280	0.19	8398	5.77
Total	30272	20.81	18145	12.48	2989	2.06	2589841	1780.75	2612	1.80	125396	86.22	386770	265.94	6895	4.74	206504	141.99
Secondary Education																		
1	1136	1.65	681	0.99	112	0.16	97170	141.30	98	0.14	4705	6.84	14511	21.10	259	0.38	7748	11.27
2	933	1.36	559	0.81	92	0.13	79798	116.04	80	0.12	3864	5.62	11917	17.33	212	0.31	6363	9.25
3	1072	1.56	643	0.93	106	0.15	91741	133.40	93	0.13	4442	6.46	13701	19.92	244	0.36	7315	10.64
4	1085	1.58	650	0.95	107	0.16	92827	134.98	94	0.14	4495	6.54	13863	20.16	247	0.36	7402	10.76
5	1168	1.70	700	1.02	115	0.17	99884	145.24	101	0.15	4836	7.03	14917	21.69	266	0.39	7964	11.58
6	1415	2.06	848	1.23	140	0.20	121055	176.03	122	0.18	5861	8.52	18078	26.29	322	0.47	9652	14.04
7	1555	2.26	932	1.35	153	0.22	132997	193.39	134	0.20	6440	9.36	19862	28.88	354	0.51	10605	15.42
8	1307	1.90	783	1.14	129	0.19	111826	162.61	113	0.16	5414	7.87	16700	24.28	298	0.43	8917	12.97
9	1383	2.01	829	1.21	137	0.20	118341	172.08	119	0.17	5730	8.33	17673	25.70	315	0.46	9436	13.72
10	1313	1.91	787	1.14	130	0.19	112369	163.40	113	0.16	5441	7.91	16781	24.40	299	0.44	8960	13.03
Total	12367	17.98	7413	10.78	1221	1.78	1058008	1538.46	1067	1.55	51227	74.49	158004	229.76	2817	4.10	84362	122.67
Higher Education																		
1	24	6.74	14	4.04	2	0.67	2035	41.72	2	0.58	99	27.93	304	86.13	5	1.54	162	45.99
2	12	3.37	7	2.02	1	0.33	1017	20.86	1	0.29	49	13.96	152	43.07	3	0.77	81	22.99
3	36	10.11	21	6.06	4	1.00	3052	62.58	3	0.87	148	41.89	456	129.20	8	2.30	243	68.98
4	27	7.58	16	4.55	3	0.75	2289	46.94	2	0.65	111	31.42	342	96.90	6	1.73	183	51.74
5	30	8.43	18	5.05	3	0.83	2543	52.15	3	0.73	123	34.91	380	107.67	7	1.92	203	57.49
6	33	9.27	20	5.56	3	0.92	2798	57.37	3	0.80	135	38.40	418	118.43	7	2.11	223	63.23
7	68	19.38	41	11.62	7	1.91	5850	119.95	6	1.67	283	80.29	874	247.63	16	4.41	466	132.22
8	71	20.22	43	12.12	7	2.00	6104	125.16	6	1.75	296	83.78	912	258.40	16	4.61	487	137.97
9	158	44.66	94	26.77	16	4.41	13480	276.40	14	3.85	653	185.01	2013	570.64	36	10.17	1075	304.67
10	419	118.82	251	71.22	41	11.73	35863	735.33	36	10.25	1736	492.19	5356	1518.11	95	27.06	2860	810.55
Total	877	248.60	526	149.01	87	24.55	75033	1538.46	76	21.45	3633	1029.76	11206	3176.19	200	56.62	5983	1695.83

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19) and Pakistan population census data (2017).

Table 1-10: Benefit Incident Analysis of Public Spending on Education by Levels of Education Enrollments, Language, and Income Group in Sindh

Income deciles	Urdu		Punjabi		Sindhi		Pushto		Balochi		Saraiki		Hindko		Brahvi		Others
	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.
Primary Education																	
1	92190	2420.51	26922	706.86	312077	8193.74	27673	726.56	10127	265.89	11305	296.81	7980	209.52	3706	97.29	13927
2	79727	2093.28	23283	611.30	269888	7086.04	23932	628.34	8758	229.94	9776	256.68	6901	181.19	3205	84.14	12044
3	73496	1929.67	21463	563.52	248793	6532.19	22061	579.23	8073	211.97	9012	236.62	6362	167.03	2954	77.56	11103
4	66531	1746.81	19429	510.12	225217	5913.18	19971	524.34	7308	191.88	8158	214.20	5759	151.20	2674	70.21	10051
5	58650	1539.89	17128	449.69	198538	5212.72	17605	462.23	6443	169.15	7192	188.82	5077	133.29	2357	61.90	8860
6	51135	1342.59	14933	392.08	173100	4544.84	15349	403.00	5617	147.48	6270	164.63	4426	116.21	2055	53.97	7725
7	45087	1183.79	13167	345.70	152626	4007.28	13534	355.34	4953	130.04	5529	145.16	3903	102.47	1812	47.58	6811
8	39955	1049.05	11668	306.35	135254	3551.17	11993	314.89	4389	115.23	4899	128.64	3459	90.81	1606	42.17	6036
9	25843	678.51	7547	198.15	87481	2296.85	7757	203.67	2839	74.53	3169	83.20	2237	58.73	1039	27.27	3904
10	10080	264.67	2944	77.29	34124	895.94	3026	79.45	1107	29.07	1236	32.45	873	22.91	405	10.64	1523
Total	542696	14248.76	158483	4161.07	1837097	48233.95	162901	4277.04	59613	1565.18	66546	1747.20	46976	1233.37	21814	572.74	81985
Secondary Education																	
1	14259	646.47	4164	188.79	48270	2188.39	4280	194.05	1566	71.01	1749	79.27	1234	55.96	573	25.99	2154
2	17447	790.98	5095	230.99	59060	2677.56	5237	237.43	1916	86.89	2139	96.99	1510	68.47	701	31.79	2636
3	21641	981.11	6320	286.51	73257	3321.20	6496	294.50	2377	107.77	2654	120.31	1873	84.92	870	39.44	3269
4	22312	1011.54	6516	295.40	75528	3424.19	6697	303.63	2451	111.11	2736	124.04	1931	87.56	897	40.66	3371
5	21305	965.90	6222	282.07	72121	3269.71	6395	289.93	2340	106.10	2612	118.44	1844	83.61	856	38.83	3219
6	25331	1148.44	7398	335.38	85750	3887.61	7604	344.73	2783	126.15	3106	140.82	2193	99.41	1018	46.16	3827
7	28854	1308.15	8426	382.02	97675	4428.27	8661	392.67	3170	143.70	3538	160.41	2498	113.23	1160	52.58	4359
8	36068	1635.19	10533	477.52	122094	5535.34	10826	490.83	3962	179.62	4423	200.51	3122	141.54	1450	65.73	5449
9	35397	1604.77	10337	468.64	119823	5432.36	10625	481.70	3888	176.28	4340	196.78	3064	138.91	1423	64.51	5347
10	41436	1878.57	12101	548.60	140266	6359.20	12438	563.89	4552	206.36	5081	230.35	3587	162.61	1666	75.51	6260
Total	264050	11971.12	77110	3495.93	893843	40523.83	79260	3593.36	29005	1314.99	32378	1467.91	22856	1036.22	10614	481.19	39890
Higher Education																	
1	119	25.71	35	7.51	404	87.05	36	13.51	13	2.82	15	3.15	10	2.23	5	1.03	18
2	835	180.00	244	52.56	2828	609.32	251	94.56	92	19.77	102	22.07	72	15.58	34	7.24	126
3	239	51.43	70	15.02	808	174.09	72	27.02	26	5.65	29	6.31	21	4.45	10	2.07	36
4	716	154.28	209	45.06	2424	522.27	215	81.05	79	16.95	88	18.92	62	13.35	29	6.20	108
5	1074	231.43	314	67.58	3636	783.41	322	121.58	118	25.42	132	28.38	93	20.03	43	9.30	162
6	1193	257.14	348	75.09	4040	870.45	358	135.09	131	28.25	146	31.53	103	22.26	48	10.34	180
7	1074	231.43	314	67.58	3636	783.41	322	121.58	118	25.42	132	28.38	93	20.03	43	9.30	162
8	3341	719.99	976	210.26	11311	2437.27	1003	378.25	367	79.09	410	88.29	289	62.32	134	28.94	505
9	6086	1311.42	1777	382.97	20602	4439.32	1827	688.95	669	144.06	746	160.81	527	113.52	245	52.71	919
10	17065	3677.11	4983	1073.83	57767	12447.50	5122	1931.77	1875	403.92	2093	450.89	1477	318.29	686	147.80	2578
Total	31743	6839.94	9270	1997.47	107455	23154.10	9528	3593.36	3487	751.35	3892	838.72	2748	592.06	1276	274.94	4795

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19) and Pakistan population census data (2017).

Table 1-11: Benefit Incident Analysis of Public Spending on Education by Levels of Education Enrollments, Language, and Income Group in Baluchistan

Income deciles	Urdu		Punjabi		Sindhi		Pushto		Balochi		Saraiki		Hindko		Brahvi		Others	
	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.	Enrol.	Exp.
Primary Education																		
1	549	17.34	760	24.01	3069	97.00	23795	752.05	23894	755.21	1783	56.35	187	5.92	11529	364.39	1760	55.63
2	964	30.48	1335	42.20	5394	170.47	41816	1321.62	41991	1327.17	3133	99.03	329	10.40	20261	640.36	3093	97.76
3	605	19.13	838	26.49	3385	106.99	26244	829.47	26354	832.95	1966	62.15	206	6.53	12716	401.90	1941	61.36
4	771	24.36	1067	33.73	4310	136.23	33417	1056.19	33558	1060.62	2504	79.14	263	8.31	16192	511.75	2472	78.13
5	726	22.95	1006	31.78	4062	128.39	31493	995.36	31625	999.54	2360	74.58	248	7.83	15259	482.28	2330	73.63
6	641	20.27	888	28.08	3588	113.41	27819	879.24	27935	882.93	2084	65.88	219	6.92	13479	426.01	2058	65.04
7	524	16.58	726	22.95	2934	92.72	22745	718.87	22840	721.89	1704	53.86	179	5.66	11020	348.31	1682	53.18
8	472	14.92	654	20.66	2640	83.45	20470	646.99	20556	649.70	1534	48.48	161	5.09	9918	313.48	1514	47.86
9	529	16.70	732	23.13	2956	93.44	22920	724.40	23016	727.44	1717	54.28	180	5.70	11105	350.99	1695	53.58
10	190	5.99	263	8.30	1061	33.52	8223	259.90	8258	260.99	616	19.47	65	2.04	3984	125.93	608	19.22
Total	5971	188.72	8268	261.33	33399	1055.62	258941	8184.11	260028	8218.45	19402	613.23	2037	64.39	125463	3965.39	19154	605.38
Secondary Education																		
1	98	8.21	136	11.37	547	45.93	4244	356.11	4262	357.60	318	26.68	33	2.80	2056	172.54	314	26.34
2	167	13.98	231	19.36	932	78.21	7227	606.35	7257	608.89	541	45.43	57	4.77	3502	293.79	535	44.85
3	177	14.87	245	20.59	991	83.17	7686	644.84	7718	647.55	576	48.32	60	5.07	3724	312.44	569	47.70
4	222	18.64	308	25.82	1243	104.28	9636	808.46	9676	811.85	722	60.58	76	6.36	4669	391.72	713	59.80
5	238	19.97	330	27.66	1332	111.73	10324	866.21	10367	869.84	774	64.90	81	6.82	5002	419.70	764	64.07
6	299	25.08	414	34.73	1672	140.28	12962	1087.57	13017	1092.14	971	81.49	102	8.56	6281	526.95	959	80.45
7	257	21.53	355	29.81	1435	120.42	11127	933.58	11174	937.50	834	69.95	88	7.35	5391	452.34	823	69.06
8	270	22.64	374	31.35	1509	126.62	11701	981.70	11750	985.82	877	73.56	92	7.72	5669	475.66	865	72.62
9	286	23.97	396	33.19	1598	134.07	12389	1039.45	12441	1043.81	928	77.89	97	8.18	6003	503.64	916	76.89
10	164	13.76	227	19.05	917	76.97	7112	596.72	7142	599.23	533	44.71	56	4.70	3446	289.13	526	44.14
Total	2177	182.65	3015	252.93	12177	1021.68	94407	7921.00	94803	7954.24	7074	593.51	743	62.32	45743	3837.91	6983	585.92
Higher Education																		
1	12	5.72	17	7.92	67	31.99	521	372.75	523	249.09	39	18.59	4	1.95	252	120.19	39	18.35
2	3	1.43	4	1.98	17	8.00	130	93.19	131	62.27	10	4.65	1	0.49	63	30.05	10	4.59
3	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
4	6	2.86	8	3.96	34	16.00	261	186.38	262	124.55	20	9.29	2	0.98	126	60.09	19	9.17
5	15	7.15	21	9.90	84	39.99	651	465.94	654	311.37	49	23.23	5	2.44	316	150.23	48	22.94
6	6	2.86	8	3.96	34	16.00	261	186.38	262	124.55	20	9.29	2	0.98	126	60.09	19	9.17
7	33	15.73	46	21.78	185	87.99	1433	1025.07	1439	685.00	107	51.11	11	5.37	694	330.51	106	50.46
8	21	10.01	29	13.86	118	55.99	912	652.32	916	435.91	68	32.53	7	3.42	442	210.33	67	32.11
9	60	28.60	83	39.60	336	159.97	2606	1863.77	2617	1245.46	195	92.93	21	9.76	1262	600.93	193	91.74
10	99	47.19	137	65.35	555	263.96	4299	3075.21	4317	2055.01	322	153.34	34	16.10	2083	991.54	318	151.37
Total	255	121.55	354	168.31	1428	679.89	11074	7921.00	11120	5293.21	830	394.96	87	41.47	5366	2553.97	819	389.90

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19) and Pakistan population census data (2017).

The overall analysis of KP reveals that the enrolment for primary education decreases as the income level increases, and public spending is allocated according to the individual's share in total enrolments. KP population consists of a large proportion of Pushto and Hindko language speakers. However, it illustrates the same behavior described in Table 1-9 regarding decile-wise enrollments across various language groups; for instance, at the primary level of education, the number of enrollments decreases with an increase in income-wise deciles. However, secondary education enrolment numbers increase as one moves to a high-income level. The analysis reveals that KP's upper 10 percent population is taking more share than the poorest deciles among different language speakers in KP. The richest 10 percent of the population, Pushto, and Hindko are enrolled in public secondary schools at a higher rate compared to other languages, which might be because they are native language speakers. A significant portion of public spending for higher education is taken by Pushto, which is 1538.46 million, and their total enrolment for higher education is 75033. Saraiki also covers significant enrolment after Pushto, so public spending for higher education is 1029.76 million.

As discussed above, the same trend is followed in Sindh, but the primary beneficiaries are Sindhi and Urdu language enrollments, as their population enrolment is significant here. Therefore, enrolment for primary education decreases as the income level increases, and public spending is directly associated with enrolment level distributed among language base enrollments enrolled in primary education. Hence, the analysis reveals that more public spending is devoted to the primary education of Sindhi and Urdu language than other languages in Sindh—Punjabi language speakers' enrollment is lower in Sindh, which is concentrated in Punjab than in Sindh. However, as income increases, all language speakers prefer sending their children to private schools to maintain their social status and prestige (Haidar & Fang, 2019).

As the case of secondary education is distributed among different language groups, as demonstrated, among the richest decile of Sindhi language enrolments, 140266 people are enrolled in public secondary education and getting the public spending of 6359.20 million. The Urdu language enrollments are getting the second most share of public spending in Sindh. Other languages are getting a low proportion of public spending on their secondary education, and the share in enrollments decreases as there is an increase in income deciles. In higher education, the primary beneficiaries of public spending for higher education are Sindhi and Urdu language groups. The same trend is followed for public

primary, secondary, and higher education, and the public enrolled in them, but here, the primary beneficiaries are Balochi, Pushto, and Brahvi language speakers. However, their enrollment share is more comparable to other language speakers, and the benefit of public spending accrues to their education is also higher.

It is evident from the initial analysis, and it is indispensable to discuss that the language of instruction offered in educational institutions is the major obstacle for lower enrollments in the lowest deciles. BIA is based on the average benefit accrued to a particular group, which significantly depends on the beneficiaries of the service provided. Besides cultural factors, foreign language instruction is a significant obstacle (Nekatibeb, 2007). As income increases, people prefer to send their children to private schools where they can learn foreign language skills; though questionable, it is the complex reality of society. Some exterior issues are putting the core issues under the carpet; for instance, private schools claiming to provide English language instructions cannot develop cognitive abilities and comprehension if the child is not sharing the mother language as the language of instruction, which is evident in Pakistan. Furthermore, a summary of language wis enrollments is also illustrated in Figure 1-14.

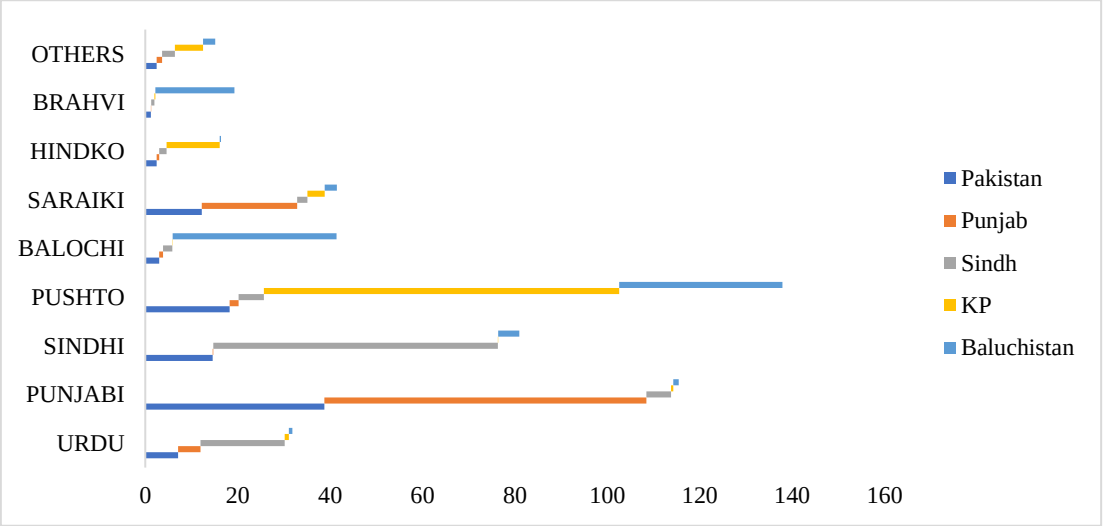


Figure 1-14: Distribution of Enrolments by Language Groups and Region Based on BIA

The impact of language barriers on education in Pakistan can be significant. Urdu is the official language of Pakistan; however, various Indigenous languages are also spoken within the country's regions. Furthermore, English is the designated language for instructional and communicative purposes in numerous academic establishments. It is also the primary language utilized in textbooks, assessments, and supplementary resources. The

linguistic diversity among students in Pakistan can present significant obstacles to effective classroom instruction. Studies have revealed that students who encounter difficulties comprehending the language of instruction due to linguistic obstacles exhibit significantly lower academic performance in fundamental subject domains than their counterparts. (Quang, 2012; Rahman, 1998; Ratna et al., 2017a; YAMEOGO, 2020).

Hence, the presence of linguistic challenges in the educational system of Pakistan represents a substantial hurdle to achieving educational goals, which impacts both primary and higher education. However, the consequences are particularly detrimental for primary learners, making it difficult to obtain a quality education in their mother language in Pakistan. In education, language barriers impact children; for instance, students who cannot communicate, especially in a foreign language, are frequently unable to interact and participate in school, resulting in inadequate comprehension of fundamental concepts, which often prevents them from moving up the educational ladder, leading to a lack of opportunities (MacKenzie, 2009; Mweri, 2020; Nekatibeb, 2007; Sheeba, 2021). Likewise, high-education learners encounter similar challenges, such as difficulty engaging in a foreign language and lacking the necessary understanding to learn a particular concept properly. Hence, language barriers create a feeling of marginalization among students in the educational setting when they are taught in a language that is not understandable to a student, causing learners to give up on the educational process, leading to reduced enrollment rates across different educational levels (Tupas, 2015).

1.3.11 Concentration of Public Spending

BIA focused on quintiles or deciles in the distribution of benefits of specific public spending. However, this research considers the decile-wise income-based distribution of the individuals. The Lorenz income distribution curve represents the income concentration across various population groups. In a similar vein, a concentration curve for public benefits compares, on the horizontal axis, the cumulative proportion of people from poorest to richest to those who have received public benefits on the vertical axis. (Ajwad & Wodon, 2002; Davoodi et al., 2010).

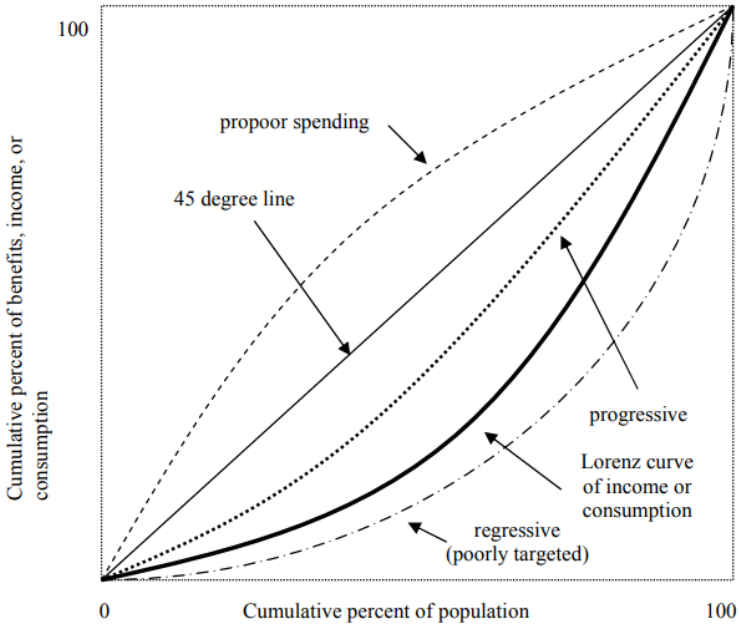


Figure 1-15: Concentration Curves for Public Spending and Various Benchmarks

Three potential concentration curves and two benchmarks, the 45-degree line and the Lorenz income curve, are depicted in Figure 1-15. Studies of BIA that have access to the underlying data depict the various distributions in Figure 1-15, which summarize the entire benefits structure of public spending using inequality measures comparable to the Gini coefficient of income, a concentration coefficient. However, this methodology is rarely employed in BIA studies. Nonetheless, this study provides information on decile shares of benefits based on a concentration curve. Nonetheless, defining concepts based on concentration curves is essential, as some BIA studies have begun to display concentrative curves and report concentration coefficients. In this regard, targeting and progressiveness help implement the fifth step of a BIA.

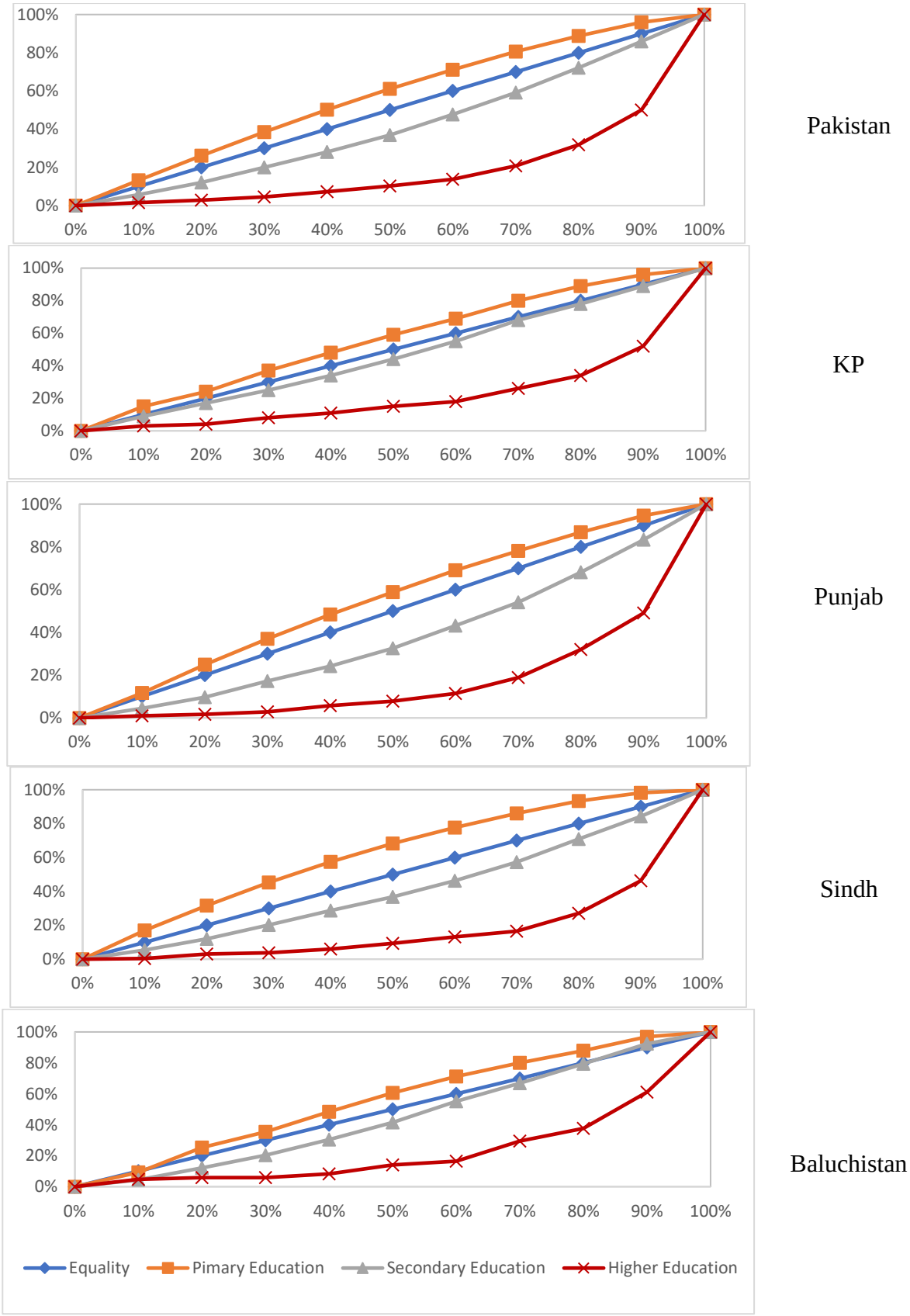
1.3.11.1 Targeting

If the benefits concentration curve in Figure 1-15 is greater than the 45-degree line, then public spending on education is considered pro-poor. This results in a concave, rather than convex, concentration curve and a negative concentration coefficient, indicating that the bottom decile receives a disproportionately large share of the benefits from public spending (Coady et al., 2004). Similarly, if the concentration curve for the benefits lies below the 45-degree line, the benefits are considered pro-rich because of the positive concentration coefficient. It is worth noting that more money is spent on anti-poverty programs, which might also be beneficial. For instance, the most pro-poor targeting strategy involves spending a small amount exclusively on the poorest user. If people with low incomes are not getting their fair share of the benefits, then it implies that public

spending does not necessarily target low-income people. A well-targeted program minimizes leakage to the non-poor, so any given resource transfer significantly impacts poor households (Coady et al., 2004).

1.3.11.2 Progressivity

The progressive nature of public spending on service is determined by positioning the concentration curve for said benefits concerning the Lorenz curve (LC) for income and the 45-degree line, as depicted in Figure 1-15. The abovementioned notion pertains to the phenomenon wherein public spending yields more advantages to individuals from lower socioeconomic strata (Davoodi et al., 2010). The benefit distributions that support low-income individuals are considered progressive and exhibit a positive concentration coefficient, i.e., the proportion of benefits from public spending decreases as income rises. The evidence suggests progressivity, as a downward trend is observed from Q1 to Q10 in the decile benefit shares allocated to the poorest and richest groups (Ilie & Rose, 2018; Younger, 2003b). The above-explained concepts wherein public spending yields more advantages to individuals from lower socioeconomic strata (Davoodi et al., 2010). The benefit distributions that support low-income individuals are considered progressive and exhibit a positive concentration coefficient, i.e., the proportion of benefits from public spending decreases as income rises. The evidence suggests progressivity, as a downward trend is observed from Q1 to Q10 in the decile benefit shares allocated to the poorest and richest groups (Ilie & Rose, 2018; Sahn & Younger, 2000).



Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19) and Pakistan population census data (2017).

Figure 1-16: Lorenz Curves - Cumulative Distribution of Public Education Spending

Table 1-12: Concentration of Public Education Spending Using The GINI Concentration Index Across Various Education Levels

	Primary Education	Secondary education	Higher Education
Pakistan	-0.1511	0.1646	0.6140
KP	-0.1340	0.0620	0.5580
Punjab	-0.1189	0.2259	0.6387
Sindh	-0.2498	0.1765	0.6489
Baluchistan	-0.1301	0.0944	0.5329

Source: Authors' estimations using MS Excel (MS Office 365) based on HIES (2018/19) and Pakistan population census data (2017).

Table 1-12 contemplated a comprehensive concentration analysis of Pakistan's public education spending, including its four provinces, KP, Punjab, Sindh, and Baluchistan, utilizing the Gini Coefficient method. The analysis depicted that public education spending in Pakistan at the primary level has a negative concentration coefficient, i.e., a Gini coefficient of -0.1511, illustrating an unequal distribution of public education spending. Moreover, public education spending is concentrated among low-income individuals, supporting this socio-economically deprived class. However, it is reported that in a class-based education system, low-income households are inclined to enroll their children in public primary school based on a variety of reasons, including lack of socio-economic resources, large family size, lack of information, and lack of trust over private institutions (Fiala & Delamonica, 2022). This pro-poor concentration of public education spending is also because only the low-income class is the beneficiary of the public primary schools. In contrast, the high-income class considers it against their status and prestige at the primary level of education (Asghar & Zahra, 2012).

Moreover, the analysis reveals that public education spending across secondary education is not equally distributed; however, the concentration of public spending is now toward high-income individuals, where a Gini coefficient of 0.1646 provides empirical evidence of inequality in education. As previously mentioned, at the primary level of education, low-income individuals were the beneficiaries of public spending on education; however, at the secondary level of education, most middle-income families, because of the high cost of education at other private primary schools, including all commentary expenses on essential education resources. The higher concentration of public education spending among secondary education compared with primary education illustrates that education

enrolment is declining among low-income families as the levels of education are increasing (Alderman et al., 2001).

The public education spending across higher education estimated a concentration coefficient of 0.6140, which indicates that high-income families rather than low-income individuals currently utilize a significant portion of public education spending. The findings support the argument that low-income families unaware of higher education opportunities view it as insignificant and prefer their children to prepare for the workforce (Hirani & Karmaliani, 2013). Enhancing children's skills and abilities through quality education yields a low current value of resources. Moreover, the high utilization of publicly provided higher education across high-income families is that the private sector education costs are exceptionally high, bearing the benefits of higher education, including their children's skills and abilities enhancement; they also get a high share in higher education level enrolment.

Comparative analysis of the concentration of public education spending across the provinces of Pakistan reveals that at the primary level, Sindh has a Gini coefficient of -0.2498, which indicates that the education spending is highly pro-poor, as a large proportion of low-income families send their children to public schools. However, in KP and Baluchistan, public spending on education at this level is minimal for low-income families. It could be that there are no excellent schools or that cultural factors discourage parents from educating their children. However, in Punjab, compared to other provinces, low-income families prefer to send their children to private schools at the primary level, resulting in a low concentration of public education spending on these families.

The concentration of public spending on education at the secondary education level in KP and Baluchistan demonstrates that high public education spending is allocated to high-income decile. In Punjab, there is large public education spending on high-income families at the secondary education level because the families prefer public institutions because of high private school costs. As there is a large concentration of families who cannot afford high private fees at higher education levels, in Sindh and Punjab, the large concentration of public education spending is on high-income families. One reason might be that higher education students from other provinces also move towards these big cities. Many low incomes could not afford this because of other expenditures.

1.4 Conclusion and Policy Recommendation

This study examined the distributional impact of public spending in Pakistan as per SDGs and UNESCO's declaration, a previously unexplored area in the literature concerning incorporating language-based enrollments in the analysis. It has incorporated the inequity issues associated with distributing benefits from public spending to various income and language groups. This study analyzed the BIA of public education spending. There is substantial diversity in public spending on education, ranging from enrollments at various educational levels, income brackets, and language groups. However, only the benefit incidence of public spending on education across income and language groups at various levels of education and among various language groups (Urdu, Punjabi, Sindhi, Pushto, Balochi, Saraiki, Hindko, Brahvi, and Others) was analyzed in this study.

According to the BIA, the poorest decile of Pakistan's population is entitled to a more significant share of public spending on primary education, whereas the richest decile receives a relatively smaller portion of public spending on education. The group with the lowest income receives more significant benefits from public spending on primary education than the group with the highest income. In the context of secondary education in Pakistan and four provinces, it is revealed that as people's incomes increase, their enrollment in public secondary schools increases due to the rising costs of private secondary school education. The selection of private schools is based on the number of students and the cost of education. Due to a lack of knowledge, low-income families view education as less important, so they prepare their children for the workforce rather than enroll them in school. Due to the high percentage of enrollees with high incomes, secondary education receives a greater increase in public funding than primary education. The relationship between primary, secondary, and higher education enrollments in Pakistan and its provinces and decile distribution is similar. Significant disparities exist in Pakistan in the distribution of public spending on higher education, which is the highest level of education. A significant enrollment disparity exists between the poorest and wealthiest deciles in higher education.

Consequently, it is stated that low-income groups benefit more from primary education than the class with the highest income; however, higher-income groups receive more benefits than the poor, and state spending on secondary and higher education favors the wealthy more than the poor. Higher education is regressive, whereas spending on

primary education is highly progressive. Four Pakistani provinces exhibit the same pattern: Punjab, KP, Sindh, and Baluchistan.

The second section of the analysis, based on the BIA of language-based enrollment at various levels of education and income groups, reveals that in Pakistan, Punjabi language speakers with lower incomes enroll at a higher rate than speakers of other languages in higher education at public institutions. Because public spending on education is skewed toward higher-income groups, enrollment in all languages for higher education in public institutions increases proportionally as income increases. However, this trend is more pronounced among Punjabi-speaking enrollments, increasing the benefits accruing to this group due to public education spending. The allocation of public spending on education for the Pushto language is relatively more significant than that for speakers of other languages. The allocation of public spending on education for the Pushto language is relatively more significant than that for speakers of other languages. In addition, sociocultural barriers and cultural values may discourage girls from enrolling in school, diminishing educational access and opportunities for Pushto speakers. In addition, language barriers can impede access to education, as many Pashto speakers may not be fluent in the national language, Urdu, or English, frequently employed in higher education. In some regions, language barriers to education may be more severe, resulting in enrollment rate disparities between speakers of different languages.

Pakistani Punjabi, Saraiki, Sindhi, Pashto, and Balochi speakers have lower enrollment rates due to inadequate educational infrastructure and lack of access to essential resources, particularly in remote locations. This results in students lacking the necessary resources for academic success. Teachers in these regions often lack modern teaching techniques and cannot adequately prepare for exams. The education system in Pakistan is not designed to serve speakers of these languages, as they are not recognized as official. Without these languages' recognition, students from these communities feel unacknowledged, leading to a lower enrollment rate (Bizenjo, 2020).

According to the BIA's findings, increasing enrollment at all educational levels is essential to improve socioeconomic well-being. Consequently, improving the quality of instruction in public schools could increase enrollment rates and educational outcomes. In addition, increasing the availability of high-quality education, especially in rural areas, may increase enrollment rates and maximize the public spending benefits accruing to this group.

Despite the relatively low allocation of resources to educational spending, there is an urgent need for effective and transparent management. Frequently, financial obstacles impede students' ability to obtain an education. To encourage enrollment in higher education, it is recommended that the government provide financial aid to students from low socioeconomic backgrounds.

In addition, the government of Pakistan may prioritize implementing bilingual education programs at the primary level of education in mother language instructions along with Urdu. Moreover, Primary education in a student's mother language can improve their ability to speak, read, and write. Early education in Urdu/mother language is recommended for optimal language acquisition because it is a critical period in children's linguistic development, which can be achieved through hiring bi-lingual teaching staff and keeping the instruction in the national language as well On the other hand, foreign language instruction can be delayed until the intermediate level, after students have developed cognitive capacities and proficient comprehension of fundamental concepts, to maximize language acquisition results while ensuring a strong foundation in the mother language. These programs would involve instructing students in their mother language at the elementary level and gradually introducing the foreign language of instruction (English) at the secondary level. This strategy is anticipated to reduce the language barrier and boost enrollment rates and academic performance by fostering enhanced student comprehension and learning outcomes.

1.5 Study Limitations and Future Research Endeavors

This study is currently limited to using the BIA approach due to the unavailability of comprehensive population census data required for calculating language-based enrolment statistics over time. To overcome this limitation, future research could expand the scope by incorporating the Marginal BIA approach, which relies on time-varying data to provide a more dynamic analysis of the distribution of public expenditure benefits. In addition to using household income as a metric for classifying income deciles in this study, future research could consider alternative indicators such as consumption expenditures to categorize individuals into different socioeconomic groups to capture the other dimension of BIA, which could provide an understanding of economic disparities, as consumption often better reflects an individual’s standard of living than income alone. Moreover, future studies could investigate the role of gender in influencing the distribution and allocation

disparities of public education spending across different income and language groups in Pakistan. Gender-based analysis could uncover unique access and benefit distribution patterns, offering insights into how public education spending might differentially affect men and women across various socioeconomic strata and linguistic communities. This expansion would provide a more comprehensive understanding of the intersectional factors affecting equity in public service provision, guiding more inclusive policy formulations that address the needs of diverse population segments.

1.6 References

Aaron, H., & McGuire, M. (1970). Public goods and income distribution. *Econometrica: Journal of the Econometric Society*, 907-920.

Ablo, E., & Reinikka, R. (1998). Do budgets matter? Evidence from public spending on education and health in Uganda. *Evidence from Public Spending on Education and Health in Uganda (June 1998)*.

Ahmad, N., & Guijun, Z. (2022). Inclusion or exclusion: Language ideology and language-in-education policies in Pakistan. *European Journal of Language Policy, 14*(2), 181-203.

Ahmed, M., Shuai, C., Abbas, K., Rehman, F. U., & Khoso, W. M. (2022). Investigating health impacts of household air pollution on woman's pregnancy and sterilization: Empirical evidence from Pakistan, India, and Bangladesh. *Energy, 247*, 123562.

Ahuja, D., & Pandit, D. (2022). Social spending as a development tool: evidence from developing countries. *European Journal of Government and Economics, 11*(1), 73-96.

Ajwad, M. I., & Wodon, Q. (2002). Who benefits from increased access to public services at the local level? A marginal benefit incidence analysis for education and basic infrastructure.

Akram, M., & Khan, F. J. (2007). Health care services and government spending in Pakistan. Retrieved from

Alderman, H., Orazem, P. F., & Paterno, E. M. (2001). School quality, school cost, and the public/private school choices of low-income households in Pakistan. *Journal of human resources*, 304-326.

Alesina, A., Baqir, R., & Easterly, W. (1999). Public goods and ethnic divisions. *The quarterly journal of economics, 114*(4), 1243-1284.

Alesina, A., & La Ferrara, E. (2005). Ethnic diversity and economic performance. *Journal of Economic Literature, 43*(3), 762-800.

Alesina, A., Perotti, R., & Spolaore, E. (1995). Togetheror separately? Issues on the costs and benefits of political and fiscal unions. *European Economic Review, 39*(3-4), 751-758.

Allen, K., Quinn, J., Hollingworth, S., & Rose, A. (2013). Becoming employable students and 'ideal'creative workers: exclusion and inequality in higher education work placements. *British Journal of Sociology of Education, 34*(3), 431-452.

Altbach, P. G. (2008). The imperial tongue: English as the dominating academic language. *International Educator, 17*(5), 56.

Alvaredo, F., Chancel, L., Piketty, T., Saez, E., & Zucman, G. (2018). *World inequality report 2018*: Belknap Press.

Amakom, U. (2020). Public spending and poverty reduction in Nigeria: A benefit incidence analysis in education and health. AERC,

Amin, B., Akram, M. B., Abbas, Z., & Iqbal, S. (2021). The State Of Education In Pakistan From 1947 To 2019: A Content Analysis Of The Three Selected English Newspapers Of Pakistan. *Ilkogretim Online, 20*(1), 6549-6559.

Amjad, R., & Kemal, A. R. (1997). Macroeconomic policies and their impact on poverty alleviation in Pakistan. *The Pakistan development review*, 39-68.

Anbumozhi, V., Kalirajan, K., & Kimura, F. (2022). Introduction: Regional Catalysts for the Realisation of the SDGs in the Post Pandemic Era. In *Sustainable Development Goals and Pandemic Planning: Role of Efficiency Based Regional Approaches* (pp. 1-24): Springer.

Angelopoulos, K., Malley, J., & Philippopoulos, A. (2007). Public education expenditure, growth and welfare.

Anlimachie, M. A., & Avoada, C. (2020). Socio-economic impact of closing the rural-urban gap in pre-tertiary education in Ghana: context and strategies. *International Journal of Educational Development, 77*, 102236.

Anwar, J., Kelly, P., & Gray, E. (2022). Girls' education in Balochistan, Pakistan: exploring a postcolonial Islamic governmentality. *British Journal of Sociology of Education, 43*(3), 433-450.

Asante, A. D., Ir, P., Jacobs, B., Supon, L., Liverani, M., Hayen, A., . . . Wiseman, V. (2019). Who benefits from healthcare spending in Cambodia? Evidence for a universal health coverage policy. *Health policy and planning, 34*(Supplement_1), i4-i13.

Asghar, Z., & Zahra, M. (2012). A Benefit Incidence Analysis of Public Spending on Education in Pakistan Using PSLM Data. *Lahore Journal of Economics, 17*(2).

Asif, M., Hayat, M., & Khan, S. (2021). Factors associated to high school students dropout in Malakand District Pakistan.

Awan, A. G., & Zia, A. (2015). Comparative Analysis of Public and Private Educational Institutions: A case study of District Vehari-Pakistan. *Journal of Education and Practice, 6*(16), 122-130.

Bangay, C. (2005). Private education: Relevant or redundant? Private education, decentralisation and national provision in Indonesia. *Compare: A Journal of Comparative and International Education, 35*(2), 167-179.

Barro, R. J. (2002). Education as a determinant of economic growth.

Barro, R. J., & Lee, J. W. (2001). International data on educational attainment: updates and implications. *oxford Economic papers, 53*(3), 541-563.

Baumfield, V., & Mattick, K. (2016). Cost, value and quality in professional learning: Promoting economic literacy in medical and teacher education. *British Educational Research Association (BERA), London, UK. URL: https://www. bera. ac. uk/proje ct/cost-value-and-quali ty-in-profe fission al-learn ing-promo ting-econ o mic-liter acy-in-medic al-and-teach er-educa tion [accessed 27 June 2020]*.

Becker, G. S. (1975). Investment in human capital: effects on earnings. In Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education, Second Edition (pp. 13-44): NBER.

Becker, W. E., & Lewis, D. R. (1993). *Higher education and economic growth*: Springer.

Berne, R., & Stiefel, L. (1984). The measurement of equity in school finance: Conceptual, methodological, and empirical dimensions: Johns Hopkins University Press.

Betts, J., & Roemer, J. E. (2005). Equalizing opportunity for racial and socioeconomic groups in the United States through educational finance reform.

Birdsall, N. (1996). Public spending on higher education in developing countries: too much or too little? *Economics of Education review, 15*(4), 407-419.

Birdsall, N., Ross, D., & Sabot, R. (1995). Inequality and growth reconsidered: lessons from East Asia. *The World Bank Economic Review, 9*(3), 477-508.

Bizenjo, S. (2020). Education in Pakistan: Are low-cost private schools closing the gender gap? *International Journal of Educational Development, 77*, 102209.

Blankenau, W. F., & Simpson, N. B. (2004). Public education expenditures and growth. *Journal of Development Economics, 73*(2), 583-605.

Bose, N., Haque, M. E., & Osborn, D. R. (2003). Public expenditure and growth in developing countries: Education is the key. *Centre for Growth and Business Cycle Research Discussion Paper Series, 30*.

Brennan, G. (1976). The distributional implications of public goods. *Econometrica: Journal of the Econometric Society*, 391-399.

Brock-Utne, B. (2001). Education for All-in whose language? *Oxford Review of Education, 27*(1), 115-134.

Brown, P., & James, D. (2020). Educational expansion, poverty reduction and social mobility: Reframing the debate. *International Journal of Educational Research, 100*, 101537.

Brueckner, M., Van Long, N., & Vespignani, J. (2022). Trade, education, and income inequality. *Applied Economics, 54*(40), 4608-4631.

Calarco, J. M. (2011). “I need help!” Social class and children’s help-seeking in elementary school. *American Sociological Review, 76*(6), 862-882.

Carnoy, M. (2011). As higher education expands, is it contributing to greater inequality? *National Institute Economic Review, 215*, R34-R47.

Chabbott, C., & Ramirez, F. O. (2000). Development and education. In *Handbook of the Sociology of Education* (pp. 163-187): Springer.

Chiswick, B. R., & Miller, P. W. (1995). The endogeneity between language and earnings: International analyses. *Journal of labor economics, 13*(2), 246-288.

Chowdhury, E. K., & Chowdhury, R. (2023). Role of financial inclusion in human development: Evidence from Bangladesh, India and Pakistan. *Journal of the Knowledge Economy*, 1-26.

Christian, M. (2002). Development Centre Studies Education and Health Expenditure, and Development the Cases of Indonesia and Peru: The Cases of Indonesia and Peru: OECD Publishing.

Coady, D., Grosh, M. E., & Hoddinott, J. (2004). Targeting of transfers in developing countries: Review of lessons and experience.

Colclough, C., & Lewin, K. M. (1993). Educating all the children: strategies for primary schooling in the South: Clarendon Press.

Condron, D. J., & Roscigno, V. J. (2003). Disparities within: Unequal spending and achievement in an urban school district. *Sociology of Education*, 18-36.

Corak, M. (2013). Income inequality, equality of opportunity, and intergenerational mobility. *Journal of Economic perspectives, 27*(3), 79-102.

Crompton, R. (2008). *Class and stratification*: Polity.

Cuenca, J. S. (2008). Benefit incidence analysis of public spending on education in the Philippines: A methodological Note. Retrieved from

Cuesta, J., Jellema, J., & Ferrone, L. (2021). Fiscal policy, Multidimensional poverty, and equity in Uganda: A Child-Lens analysis. *The European Journal of Development Research, 33*, 427-458.

Dale-Olsen, H., & Finseraas, H. (2020). Linguistic diversity and workplace productivity. *Labour Economics, 64*, 101813.

Davoodi, H. R., Tiongson, E. R., & Asawanuchit, S. S. (2010). Benefit incidence of public education and health spending worldwide: evidence from a new database. *Poverty & Public Policy, 2*(2), 5-52.

De Wulf, L. (1975). Fiscal Incidence Studies in Developing Countries: Survey and Critique (Etude sur l'incidence de la politique budgétaire dans les pays en voie de développement: examen analytique et critique)(Estudios de incidencia fiscal en los países en desarrollo: Investigación y crítica). *Staff Papers-International Monetary Fund*, 61-131.

Demery, L. (2003). Analyzing the incidence of public spending. The impact of economic policies on poverty and income distribution: Evaluation techniques and tools, 41-68.

Demery, L., & Gaddis, I. (2009). Social Spending, Poverty and Gender Equality in Kenya-A Benefit Incidence Analysis. *Eschborn: German Technical Cooperation*, 1-38.

Di Gioacchino, D., Sabani, L., & Tedeschi, S. (2019). Individual preferences for public education spending: does personal income matter? *Economic Modelling, 82*, 211-228.

Dreze, J., & Sen, A. (2003). Basic education as a political issue. Education, society and development: National and international perspectives, 3.

Duflo, E., & Banerjee, A. (2011). *Poor economics* (Vol. 619): PublicAffairs New York, NY, USA.

Easterbrook, M. J., & Hadden, I. R. (2021). Tackling educational inequalities with social psychology: Identities, contexts, and interventions. *Social Issues and Policy Review, 15*(1), 180-236.

Easterly, W., Alesina, A. F., & Baqir, R. (1997). Public Goods and Ethnic Divisions. *Available at SSRN 46092*.

Easterly, W., & Levine, R. (1997). Africa's growth tragedy: policies and ethnic divisions. *The quarterly journal of economics*, 1203-1250.

Ferraro, S., Agasisti, T., Porcelli, F., & Soncin, M. (2021). Local governments' efficiency and educational results: empirical evidence from Italian primary schools. *Applied Economics, 53*(35), 4017-4039.

Fiala, O., & Delamonica, E. (2022). Public Spending and Investment in Children: Measuring and Assessing Social and Economic Justice. In *Social Justice for Children in the South* (pp. 43-59): Springer.

Furqan, U., Hanif, A., & Hanif, M. Z. (2022). The Struggle to Reform Higher Education Sector of Pakistan: Past reforms, Recent Initiatives and Confronted Challenges. *Journal of the Research Society of Pakistan, 59*(2), 138.

Gafar, J. (2006). The benefit–incidence of public spending: The Caribbean experience. *Journal of International Development: The Journal of the Development Studies Association, 18*(4), 449-468.

Gallagher, M. (1993). A public choice theory of budgets: implications for education in less developed countries. *Comparative Education Review, 37*(2), 90-106.

Gannon, K. E., Pettinotti, L., Conway, D., Surminski, S., Ndilanha, E., & Nyumba, T. (2022). Delivering the Sustainable Development Goals through development corridors in East Africa: A Q-Methodology approach to imagining development futures. *Environmental Science & Policy, 129*, 56-67.

Gillespie, I. (1966). The Incidence of Taxes and Public Expenditures in the Canadian Economy. Studies of the Royal Commission on Taxation. *Carleton University, Dept. of Economics (2)*.

Gisselquist, R. M., Leiderer, S., & Nino-Zarazua, M. (2016). Ethnic heterogeneity and public goods provision in Zambia: Evidence of a subnational “diversity dividend”. *World Development, 78*, 308-323.

Glewwe, P., & Kremer, M. (2006). Schools, teachers, and education outcomes in developing countries. *Handbook of the Economics of Education, 2*, 945-1017.

Glewwe, P., Lambert, S., & Chen, Q. (2020). Education production functions: updated evidence from developing countries. In *The Economics of Education* (pp. 183-215): Elsevier.

Glewwe, P. W., Hanushek, E. A., Humpage, S. D., & Ravina, R. (2011). School resources and educational outcomes in developing countries: A review of the literature from 1990 to 2010.

Glick, P. (2008). What policies will reduce gender schooling gaps in developing countries: Evidence and interpretation. *World Development, 36*(9), 1623-1646.

Günther, J., Overbeck, A. K., Muster, S., Tempel, B. J., Schaal, S., Schaal, S., . . . Otto, S. (2022). Outcome indicator development: Defining education for sustainable development outcomes for the individual level and connecting them to the SDGs. *Global Environmental Change, 74*, 102526.

Gupta, M. S., Tiongson, M. E., & Verhoeven, M. (1999). *Does higher government spending buy better results in education and health care?* : International Monetary Fund.

Habib, M. (2013). Education in Pakistan's Punjab: Outcomes and Interventions. *Lahore Journal of Economics, 18*.

Haidar, S., & Fang, F. (2019). English language in education and globalization: A comparative analysis of the role of English in Pakistan and China. *Asia Pacific Journal of Education, 39*(2), 165-176.

Haider, S. A., Gul, A., Anwar, B., Tehseen, S., & Iqbal, S. (2021). The impacts of the COVID-19 outbreak on the education sector: Evidence from Pakistan. In *Impact of infodemic on organizational performance* (pp. 311-328): IGI Global.

Hakro, A. N. (2007). The Incidence of Government Expenditures on Education and Health: Microeconomic Evidence from Pakistan Ahmed Nawaz Hakro and Muhammed Akram. *Lahore Journal of Economics, 12*(2), 27-48.

Hanushek, E. A. (1986). The economics of schooling: Production and efficiency in public schools. *Journal of Economic Literature, 24*(3), 1141-1177.

Hanushek, E. A. (1994). Money might matter somewhere: A response to Hedges, Laine, and Greenwald. *Educational Researcher, 23*(4), 5-8.

Haveman, R., & Smeeding, T. (2006). The role of higher education in social mobility. *The Future of children*, 125-150.

Hedges, L. V., Laine, R. D., & Greenwald, R. (1994). An exchange: Part I: Does money matter? A meta-analysis of studies of the effects of differential school inputs on student outcomes. *Educational Researcher, 23*(3), 5-14.

Heltberg, R., Simler, K. R., & Tarp, F. (2003). *Public spending and poverty in Mozambique*. Retrieved from

Heymann, J., Raub, A., & Cassola, A. (2014). Constitutional rights to education and their relationship to national policy and school enrolment. *International Journal of Educational Development, 39*, 121-131.

Heyneman, S. P., & Stern, J. M. (2014). Low cost private schools for the poor: What public policy is appropriate? *International Journal of Educational Development, 35*, 3-15.

Hirani, S. A. A., & Karmaliani, R. (2013). The experiences of urban, professional women when combining breastfeeding with paid employment in Karachi, Pakistan: a qualitative study. *Women and birth, 26*(2), 147-151.

Ilie, S., & Rose, P. (2018). Who benefits from public spending on higher education in South Asia and sub-Saharan Africa? *Compare: A Journal of Comparative and International Education, 48*(4), 630-647.

Jabeen, S. (2020). Language planning and policy, and the medium of instruction in the multilingual Pakistan: a void to be filled. *International Journal of Multilingualism*, 1-18.

Jackson, B., & Marsden, D. (1966). Education and the Working Class (1962). *Both published by Routledge & Kegan Paul, London*.

Jackson, M. I., & Schneider, D. (2022). Public investments and class gaps in parents' developmental expenditures. *American Sociological Review, 87*(1), 105-142.

Jamal, A. (2016). Why he Won't send his daughter to school—Barriers to girls' education in Northwest Pakistan: A qualitative Delphi study of Pashtun men. *Sage Open, 6*(3), 2158244016663798.

James, E. (1993). Why do different countries choose a different public-private mix of educational services? *Journal of human resources*, 571-592.

Jenkins, G. (1980). Who benefits from government expenditures? A case study of colombia: Marcelo Selowsky (Oxford University Press, New York, 1979) pp. xv+ 186, cloth $12.50 paperback $4.98. *Journal of Development Economics, 7*(4), 584-587.

Jimenez, E., & Tan, J. P. (1987). Decentralised and private education: The case of Pakistan. *Comparative Education, 23*(2), 173-190.

Judson, R. (1998). Economic growth and investment in education: how allocation matters. *Journal of Economic Growth, 3*(4), 337-359.

Kang, E. (2022). Whose money matters in public education: A "public" good that parents purchase. *Policy Futures in Education, 20*(8), 960-985.

Khan, S. (2016). Impact of father education on female education in Pashtun society of district Charsadda, Pakistan. *Imperial Journal of Interdisciplinary Research, 2*(4), 1013-1019.

Kirama, S. L. (2021). Public Social Spending and Poverty in Tanzania: A Benefit Incidence Analysis. *Tanzanian Economic Review, 11*(1).

Klees, S. J. (2008). A quarter century of neoliberal thinking in education: Misleading analyses and failed policies. *Globalisation, Societies and Education, 6*(4), 311-348.

Kotlikoff, L. J., & Summers, L. H. (1987). Tax incidence. In *Handbook of public economics* (Vol. 2, pp. 1043-1092): Elsevier.

Kousar, S., Ahmed, F., Afzal, M., & Segovia, J. E. (2023). Is government spending in the education and health sector necessary for human capital development? *Humanities and Social Sciences Communications, 10*(1), 1-11.

Krishnaratne, S., & White, H. (2013). Quality education for all children? What works in education in developing countries. Retrieved from

Lanjouw, P., & Ravallion, M. (1999). Benefit incidence, public spending reforms, and the timing of program capture. *The World Bank Economic Review, 13*(2), 257-273.

Love-Koh, J., Griffin, S., Kataika, E., Revill, P., Sibandze, S., & Walker, S. (2020). Methods to promote equity in health resource allocation in low-and middle-income countries: an overview. *Globalization and health, 16*, 1-12.

MacKenzie, P. J. (2009). Mother tongue first multilingual education among the tribal communities in India. *International Journal of Bilingual Education and Bilingualism, 12*(4), 369-385.

Mainardi, S. (2007). Unequal access to public healthcare facilities: theory and measurement revisited. *Surveys in Mathematics and its Applications, 2*, 91-112.

Malik, A. H. (2015). A comparative study of elite English-medium schools, public schools, and Islamic Madaris in contemporary Pakistan: Lulu. com.

Malik, S. M., & Ashraf, N. (2016). Equity in the use of public services for mother and newborn child health care in Pakistan: a utilization incidence analysis. *International journal for equity in health, 15*(1), 1-12.

Manan, S. A., David, M. K., & Dumanig, F. P. (2015). Disjunction between language policy and children's sociocultural ecology–an analysis of English-medium education policy in Pakistan. *Language and Education, 29*(5), 453-473.

McDonough, P. M. (1994). Buying and selling higher education: The social construction of the college applicant. *The Journal of Higher Education, 65*(4), 427-446.

McMahon, W. W. (2009). The Private and Social Benefits of Higher Education. In: Baltimore: The Johns Hopkins University Press.

Meerman, J. (1979a). Public expenditure in Malaysia: Who benefits and why.

Meerman, J. (1979b). Public expenditure in Malaysia; who benefits and why.

Meredith, B., & Underwood, J. (1995). Irreconcilable differences-defining the rising conflict between Regular and Special Education. *JL & Educ., 24*, 195.

Mieszkowski, P. (1969). Tax incidence theory: The effects of taxes on the distribution of income. *Journal of Economic Literature, 7*(4), 1103-1124.

Miguel, E., & Gugerty, M. K. (2005). Ethnic diversity, social sanctions, and public goods in Kenya. *Journal of Public Economics, 89*(11-12), 2325-2368.

Mingat, A. (1998). The strategy used by high-performing Asian economies in education: Some lessons for developing countries. *World Development, 26*(4), 695-715.

Miningou, É. W., Pierre-Louis, M., & Bernard, J. M. (2022). Improving learning outcomes in francophone Africa: More resources or improved efficiency? *African Development Review, 34*(1), 127-141.

Mitra, A. (2015). Public spending in higher education in India: A benefit incidence analysis. *Higher Education for the Future, 2*(1), 71-91.

Morris, P. (1996). Asia's four little tigers: A comparison of the role of education in their development. *Comparative Education, 32*(1), 95-110.

Mweri, J. (2020). Sustainable Development Goals: Reaching People through Their Mother Tongue. *Linguistics and Literature Studies, 8*(1).

Nafula, N. N. (2002). Achieving sustainable universal primary education through debt relief: The case of Kenya: WIDER Discussion Paper.

Naveed, A., & Sutoris, P. (2020). Poverty and education in South Asia. *Handbook of education systems in South Asia*, 1-23.

Nawab, A. (2017). What difference could in-service training make? Insights from a public school of Pakistan. *Teacher Development, 21*(1), 142-159.

Nekatibeb, T. (2007). The impact of learning with the mother tongue on academic achievement: A case study of Grade 8 students in Ethiopia. *Language and development: Africa and beyond, 51*.

Nguyen, N. N. (2004). Trends in the education sector. *Economic growth, poverty, and household welfare in Vietnam*, 425-466.

Norman, G., Tugwell, P., Feightner, J., MUZZIN, L. J., & Jacoby, L. (1985). Knowledge and clinical problem-solving. *Medical Education, 19*(5), 344-356.

Panezai, S. G., & Channa, L. A. (2017). Pakistani government primary school teachers and the English textbooks of Grades 1–5: A mixed methods teachers'-led evaluation. *Cogent Education, 4*(1), 1269712.

Pritchett, L., & Filmer, D. (1999). What education production functions really show: a positive theory of education expenditures. *Economics of Education review, 18*(2), 223-239.

Pučėtaitė, R., Novelskaitė, A., Pušinaitė-Gelgotė, R., Rusteikienė, A., & Butkevičienė, E. (2019). Understanding the Role of Social Enterprises in Attaining the Sustainable Development Goals through the Human Capability Approach.

Quang, C. D. (2012). The mother language teaching program addressing the language, culture, and identity rights of the Cham minority in Ninh Thuan province, Vietnam. University of Hawai'i at Manoa,

Qureshi, M. G. (2012). The gender differences in school enrolment and returns to education in Pakistan. *The Pakistan Development Review*, 219-256.

Qureshi, N., & Kalsoom, Q. (2022). Teacher Education in Pakistan: Structure, Problems, and Opportunities. In *Handbook of Research on Teacher Education: Innovations and Practices in Asia* (pp. 971-986): Springer.

Rahman, T. (1995). *Language planning and politics in Pakistan*: Sustainable Development Policy Institute.

Rahman, T. (1998). Language and ethnicity in Pakistan. In *Text in Education and Society* (pp. 238-245): World Scientific.

Rahman, T. (2004). *Language policy and localization in Pakistan: proposal for a paradigmatic shift.* Paper presented at the SCALLA Conference on computational linguistics.

Rahman, T. (2007). Language planning in higher education: A case study of Pakistan. In: JSTOR.

Ramanathan, V. (2005). The English-vernacular divide: Postcolonial language politics and practice (Vol. 49): Multilingual Matters.

Ratna, N., Grafton, R. Q., & To, H. (2017). The 'Paradox of Diversity': Economic Evidence from US Cities 1980-2010. *Asia & the Pacific Policy Studies, 4*(1), 20-37. doi:10.1002/app5.162

Rehman, A., Jingdong, L., & Hussain, I. (2015). The province-wise literacy rate in Pakistan and its impact on the economy. *Pacific Science Review B: Humanities and Social Sciences, 1*(3), 140-144.

Ricardo, D. (1822). *On protection to agriculture*: J. Murray.

Robeyns, I. (2003). Sen's capability approach and gender inequality: selecting relevant capabilities. *Feminist economics, 9*(2-3), 61-92.

Sabir, M., & Abdullah, T. (2002). Gender and Public Spending on Education in Pakistan: A Case Study of Disaggregated Benefit Incidence [with Comments]. *The Pakistan Development Review*, 477-493.

Sah, P. K. (2022). English medium instruction in South Asia's multilingual schools: unpacking the dynamics of ideological orientations, policy/practices, and democratic questions. *International Journal of Bilingual Education and Bilingualism, 25*(2), 742-755.

Saher, A., Mehmood, R., & Farhad, A. (2023). Corpus based Investigation of Gender Representation in Education: A Content Analysis of Pakistani and Indian High Secondary Schools' Text Books. *Journal of Development and Social Sciences, 4*(1), 28-35.

Sahn, D. E., & Younger, S. D. (2000). Expenditure incidence in Africa: microeconomic evidence. *Fiscal studies, 21*(3), 329-347.

Sajjad, M., Munir, H., Kanwal, S., & Naqvi, S. A. A. (2022). Spatial inequalities in education status and its determinants in Pakistan: A district-level modelling in the context of sustainable development Goal-4. *Applied Geography, 140*, 102665.

Salmi, J., & D'Addio, A. (2021). Policies for achieving inclusion in higher education. *Policy Reviews in Higher Education, 5*(1), 47-72.

Scherf, R., & Weinzierl, M. (2020). Understanding different approaches to benefit-based taxation. *Fiscal studies, 41*(2), 385-410.

Schultz. (1999). Women's Role in the Agricultural Household: Bargaining and Human Capital.

Schultz, T. W. (1961). Investment in human capital. *The American economic review, 51*(1), 1-17.

Selowsky, M. (1979a). Target group-oriented food programs: Cost effectiveness comparisons. *American Journal of Agricultural Economics, 61*(5), 988-994.

Selowsky, M. (1979b). *Who benefits from government expenditure?* : Published for the World Bank [by] Oxford University Press.

Sen, A. (1999). *Economic policy and equity: an overview*: International Monetary Fund Washington, DC.

Shah, D., Haider, G., & Taj, T. (2019). Causes of Dropout Rate at Primary Level in Pakistan. *International Journal of Curriculum and Instruction, 11*(2), 38-74.

Shallwani, S. (2019). Conceptualizing early schooling in Pakistan: perspectives from teachers and parents. *Early Childhood and Development Work: Theories, Policies, and Practices*, 133-152.

Shamim, F. (2008). Trends, issues and challenges in English language education in Pakistan. *Asia Pacific Journal of Education, 28*(3), 235-249.

Sheeba, C. (2021). The Link between Mother Tongue and creativity. *International Journal of Modern Agriculture, 10*(1), 901-905.

Sibanda, L. (2023). Strategies for Achieving Equity-Based Education: Towards an Equitable Education System. In *Social Justice and Culturally-Affirming Education in K-12 Settings* (pp. 133-152): IGI Global.

Soomro, K. A., Kale, U., Curtis, R., Akcaoglu, M., & Bernstein, M. (2020). Digital divide among higher education faculty. *International Journal of Educational Technology in Higher Education, 17*, 1-16.

Stichnoth, H., & Van der Straeten, K. (2013). Ethnic diversity, public spending, and individual support for the welfare state: A review of the empirical literature. *Journal of Economic Surveys, 27*(2), 364-389.

Tamim, T. (2021). Language, Class, and Education: Deconstructing the Centre to Rethink Inclusivity in Education in Pakistan. *Cogent Education, 8*(1), 1897933.

Tanzi, V., & Chu, K.-y. (1998). *Income distribution and high-quality growth*: Mit Press.

Teles, V. K., & Andrade, J. (2008). Public investment in basic education and economic growth. *Journal of Economic Studies*.

Tilak, J. B. (1987). *The economics of inequality in education*: Sage Publications India (Pvt) Ltd.

Todd, P. E., & Wolpin, K. I. (2007). The production of cognitive achievement in children: Home, school, and racial test score gaps. *Journal of Human capital, 1*(1), 91-136.

Tupas, R. (2015). Inequalities of multilingualism: Challenges to mother tongue-based multilingual education. *Language and Education, 29*(2), 112-124.

Ugwoji, C. (2022). The Relationship Between Developmental Social Work, Poverty Alleviation, and Sustainable Development in Nigeria: Issues, Challenges, and Opportunities. In *Microfinance and Sustainable Development in Africa* (pp. 279-305): IGI Global.

Ullah, H., & Skelton, C. (2013). Gender representation in the public sector schools textbooks of Pakistan. *Educational Studies, 39*(2), 183-194.

Van de Walle, D. (2002). The static and dynamic incidence of Vietnam's public safety net: World Bank Publications.

Van de Walle, D., & Nead, K. (1995). *Public spending and the poor: Theory and evidence*: World Bank Publications.

Van de Walle, D. P. (1995). Public spending and the poor: what we know, what we need to know. *What We Need to Know (June 1995)*.

Vegas, E., & Coffin, C. (2015). When education expenditure matters: An empirical analysis of recent international data. *Comparative Education Review, 59*(2), 289-304.

YAMEOGO, S. (2020). Official language, ethnic diversity and industrialization in Africa. KDI School,

Yang, M., & Lee, H. J. (2022). Do school resources reduce socioeconomic achievement gap? Evidence from PISA 2015. *International Journal of Educational Development, 88*, 102528.

Younger, S. D. (2003a). Benefits on the margin: evaluating alternatives to traditional benefit incidence analysis. *World Bank Economic Review, 17*(1), 89-106.

Younger, S. D. (2003b). Benefits on the margin: Observations on marginal benefit incidence. *The World Bank Economic Review, 17*(1), 89-106.

Zaman, A. (2008). Gender Sensitive Teaching: A Reflective Approach for Early Childhood Education Teacher Training Programs. *Education, 129*(1).

Chapter 2

2 Essay 2: Assessment and Implications of Language Diversity and its Impact on Educational Attainment in Pakistan

Abstract

Essay 2 examines the notion of "Education for all – but in whose language?" considering the insufficient attention given to the linguistic context of primary learners in Pakistan. The study examined data from various districts in Pakistan to determine the impact of linguistic diversity on enrollment in primary education. The findings indicated an inverse relationship between the level of language diversity and the rates at which individuals enrolled. Early exposure to multiple languages in instruction has a negative impact on enrollment rates, whereas higher levels of education display a distinct enrollment pattern. Policy formulation should recognize the significance of utilizing the native language in Pakistani primary educational institutions to enhance educational outcomes. The government might consider implementing an education policy that involves a phased shift from teaching mother-language instruction (primary education) to foreign language (secondary/higher education) instruction during secondary and higher education.

Keywords: Language Diversity; Mother Language; Education Enrollments; Language Groups

2.1 Introduction and Research Background

The primary function of the mother language is to serve as a "medium of comprehension," "medium of thinking," "medium of understanding," and "medium of creativity." The "medium of communication" is the secondary function of the mother language. The spoken language of an individual is crucial because it is the best medium for acquiring knowledge from the heart, which fosters logical development and the sharing of meaning and experience through the mother language. One of the popular criteria used to define the mother language is that it is

> “The language one thinks, dreams and counts in”
>
> (Skutnabb-Kangas, 1981)

One might assume that the functions are typically acquired in one's mother language and are subsequently conducted in that language, suggesting a strong connection between language and the mind. It relates to the way an individual forms and processes ideas. Hence, it is apparent that, in most cases, thinking is impossible without language. This point highlights the psychological significance of language to humans, specifically the mother language, which is the language that a child learns first (Chumbow, 1990).

Brock-Utne (2001b) argued, *"Education for all – but in whose language?"* Disregarding the linguistic context of young students, this concept appears entirely impractical. How can you learn if you do not understand what you are being taught? According to UNESCO (2012), approximately 40 percent of the global population does not have access to education in their mother language. Hence, access to education becomes more challenging in linguistically diverse regions (UNDP, 2004).

Since 1953, UNESCO has promoted mother-language instruction in primary education and emphasized the benefits of mother-language education from the start of school enrollment, where children are more likely to learn and comprehend the concepts and improve cognitive capabilities (Benson, 2005; Bialystok, 2001; Cummins, 2000; Kosonen, 2005). Furthermore, using the mother language in education decreases the probability of repeating grades (Hovens, 2002; UNESCO, 2012). Thus, mother-language-based instructions in education proved a successful model for attaining the objective of "Education for all" (Kosonen & Benson, 2013; Yiakoumetti, 2012). Thus, the mother language is a driving force to promote education with actual learning, and such benefits transmit additional economic gains (Sheeba, 2021). Distinguishing people's profound importance on their first language is fundamental for increasing overall economic development and reducing income and Education disparities (Ginsburgh & Weber, 2020; Mweri, 2020).

2.1.1 UNESCO's Position

Several UNESCO declarations emphasized the educational rights of individuals who speak their mother language and the endorsement of their cultural diversity[2] following

[2] Article 5 of the 1960 Convention against Discrimination in Education
Article 22 of the 1976 Recommendation on the Development of Adult Education
Article 9 of the 1978 Declaration on Race and Racial Prejudice
Article 6 of the 2001 Universal Declaration on Cultural Diversity

international agreements that outline the rights of individuals who belong to minority groups to use their language in education. These agreements also state that children must be taught to "read and write in their mother language with adequate measures to ensure its pursuance.

“Pupils should begin their schooling through the medium of the mother tongue” and “the use of the mother tongue is extended to as late a stage in education as possible.”

(UNESCO, 1953)

To support these rights, UNESCO provides national policymakers and planners with guidance on implementing bilingual and multilingual education policies, the language of instruction policies, the development of teaching-learning materials in national languages, the promotion of cultural and linguistic diversity, and mother language instruction in education. These documents demonstrated three common and fundamental guiding principles (UNESCO, 2003); first, UNESCO considers and supports mother-language instruction to enhance educational quality, which capitalizes on learners' and teachers' knowledge and experience. Second, UNESCO supports bilingual/multilingual education at all levels of education to promote social and gender equality, a fundamental component of linguistically diverse societies. Thirdly, UNESCO promotes language as an essential component of intercultural education to foster mutual understanding between diverse population groups and ensure the protection of human rights.

Instruction in one's mother language is crucial because it promotes educational inclusion. According to UNESCO (2005), a linguistic divergence between school and community can impede access to school services, particularly regarding girls' education, where all individuals perhaps do not have adequate knowledge of the languages used in education. Consequently, they are underprivileged regarding educational access due to the prevalent language policies and threatened with exclusion from education.

The 2006 Education for All Report “Literacy for Life” reviewed the educational disadvantages experienced by Indigenous groups. According to the report, between 300 and 350 million Indigenous people speak 4,000 and 5000 languages in more than 70 countries. The report illustrated substantial disparities between Indigenous and non-Indigenous groups concerning education, as Indigenous people have significantly lower literacy rates than non-Indigenous people because of not using their mother language in education. It is widely acknowledged that early education in the mother language benefits

a child's cognitive development. However, most countries facing significant literacy challenges are linguistically diverse, necessitating a balance between pedagogical effectiveness and cost preferences, as well as political and ethnic sensitivity and learner preferences. The 2008 report titled Education for All “By 2015: Will We Succeed?" highlighted that effective teaching and improved learning outcomes are intimately entangled with language issues. In many countries, the number of spoken languages exceeds that of instructional languages.

"Globally, there are 50-75 million 'marginalized' children who are not enrolled in schools because the mother language is not the language of instruction in schools. Children's first language is the optimal language for literacy and learning throughout the primary school.”

(UNESCO, 2008).

Consequently, many students enter school with a second language as a medium of instruction, which is not spoken at home and differs from the medium of instruction. The 2008 Report noted that research consistently demonstrates that children acquire linguistic and cognitive skills more quickly in their mother language and can subsequently transfer them to a widely used, national or regional language. The report also revealed that, despite much work to be done, significant progress is being made, and there is a growing acceptance of multilingualism and mother language instruction in primary education. According to UNESCO (2017), teaching children in their mother language is crucial for their cognitive abilities and the community's cultural and linguistic identity.

In addition to UNESCO's declarations, literature contemplated the significance of the mother language (Clegg & Milligan, 2021; Mohanty, 2019; Mohanty et al., 2009; Rahman et al., 2019). It conceded that the use of the mother language is a significantly good education model that carries the potential to develop cognitive skills and better academic performance, which is essential for linguistic and cultural (re) vitalization (MananDavidDumanig, 2015; MananDavidDumanig et al., 2015; Mohanty, 2019). Incomprehension of subject matter, lack of creativity and critical thinking, and parents' disengagement with their children's learning processes are some of the disadvantages associated with being educated in a language that is not spoken at home, which may cause students to drop out of school, especially in rural areas (Fujii et al., 2023; Wong & Benson, 2019).

Contradictory stakeholder interests compromise these languages and all their embodied knowledge; people are forced to abandon their mother language and native cultures in their home countries (Hornberger, 2008; Skutnabb-Kangas, 2000). According to Johnson and Pratt (2014), language instruction has historically been used to eradicate, subjugate, and marginalize minority and indigenous languages and their speakers. Schools serve as their implementation instruments. To promote regional, mother, and indigenous languages, Manan et al. (2017) emphasize the importance of mother language early childhood education for the development of cognitive skills, culture, and ethnolinguistic identity (Bazai et al., 2022; Benson, 2019). Moreover, Manan et al. (2019) discovered that mother language learning practices increase young students' engagement, participation, academic performance, and dropout rates.

The literature on the role of instruction medium in primary school educational outcomes is limited, with most of the studies originating from bilingual education literature; however, the scant research on the subject has not yielded conclusive results. In the United States, it has been documented that immigrant students taught in their mother language outperformed their peers taught in English (Willig, 1985). Students taught in their foreign language performed less well than those taught in their mother language in other countries (Airey, 2009; Bamgbose, 1999; Gfeller & Robinson, 1998; Yip et al., 2003).

However, mother languages, known as the first languages (such as Punjabi, Saraiki, Pushto, and Balochi) in Pakistan, receive little recognition and support in planning education (Richards & Schmidt, 2014). English has risen to the top of the country's linguistic hierarchy with the recognition of institutional support. English is the official language in all central government domains and is a stepping stone to socioeconomic advancement (Manan et al., 2017). On the other hand, neglecting mother languages lowers their status and prevents most of their speakers from achieving formal literacy in their mother language. The vision and formulation of the state's language policy were based on the traditional "one nation, one language" ideology, consequently demonstrating the state’s neglect of several other more significant languages used by the major ethnolinguistic groups in Pakistan (Manan & Hajar, 2022).

2.1.2 Significance, Research Gap, and Literature Contributions

It is essential to recognize that providing education in a language that a child does not understand can cause them psychological distress. In the multilingual environment of

Pakistan, the medium of instruction in schools is not the children's mother language, which remains the practice in public schools despite research indicating that children acquire linguistic and cognitive skills more effectively in their mother language. According to Rahman (2020a) and the British Council's (2020) report, in Pakistan, only 60 percent of children complete primary school, and 10 percent complete secondary school, with 59 percent of girls attending primary school compared to 73 percent of boys because of their distress with the language of instruction. The medium of instruction in many public schools is not the same as used at home, and they face significant obstacles, particularly in their early years of schooling, such as slower progress in reading and writing; however, the situation is worse when students are required to learn English on compulsory grounds that facts are illustrated in the table below (MICS, 2019).

Table 2-1: Percentage Distribution of Total Enrolments Who Use Same Language at School and at Home

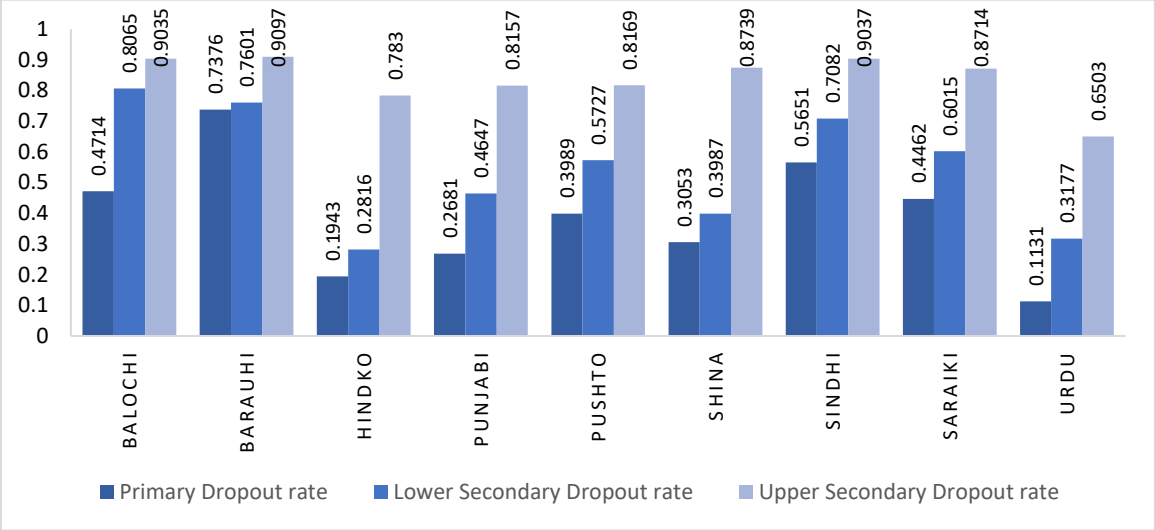
	PUNJAB	SINDH	KPK	BALUCHISTAN
	7.7	71.5	3.4	3.8
	Area of residence			
Rural	8.2	71.4	2.2	2.1
Urban	7.9	71.5	9.1	6.6
	Sex			
Male	8.9	71.1	3.5	3.7
Female	6.4	72	3.4	3.8
	Age at the beginning of the school year			
6	10.4	71.9	5.7	0.9
7	7.7	69.3	3.7	3.6
8	7.9	71.7	3.2	3.4
9	7.5	68.7	2.2	4.1
10	7.6	74.7	3.7	3.5
11	8.1	71.9	4.1	5.8
12	6.3	74.4	3.8	3.3
13	6	71.4	2.1	4
14	4.7	68	4.2	3.6
	Wealth index quintile			
Poorest	13.2	67.1	2.1	-
Poor	6.8	73.6	1.9	-
Middle	4.8	72.9	1.3	-
Rich	4.7	71.7	1.9	-
Richest	9.6	70.2	9.6	-

Source: Multiple Indicator Cluster Survey (MICS)

Note: (-) indicates missing observations.

Empirical studies from developed and developing countries demonstrated that individuals with a language of instruction other than their mother language yield achievement levels and experience higher dropout rates.

This is illustrated by the findings of WIDE (2019), which revealed that across various language groups, dropouts are increasing as there is an increase in the level of education because higher education forces an individual to learn in a foreign language, not in their mother language is illustrated in Figure 2-2:, which demonstrate the relevant ration. The problem is even more severe in rural areas, where the children have little or no exposure to English outside the school setting (Rahman, 2020a; Tamim, 2021).



Source: UNESCO's World Inequality Database on Education 2019

Figure 2-1: Percentage Distribution of Dropouts by Education Level and Language Groups

Effective education requires student-centered content and an approach to teaching that meets the student's needs and abilities and that the learning objectives be stated in terms of the learner's behavior. However, learning starts in a language unfamiliar to the learner; they encounter an obstruction. The Pakistani education system perhaps assumes a student to learn a new language and simultaneously base literacy development with other skills based on a foreign language, which is irrational and contrasts with the accepted learning principles (Teimouri et al., 2019). How individuals can read and write what they do not speak and understand is the same as asking them to run when they have not learned to stand alone! The barrier of starting school in a language, not the student's mother language reinforces passiveness and silence in classrooms, suppressing the student's

potential and liberty to express themselves; consequently, it inhibits their creativity and makes the learning experience unpleasant.

Most of these studies were conducted on micro-level classes; however, the conclusions vary based on class-specific variables. In addition, the literature is silent, presenting empirical evidence on the macro level data, i.e., the investigation of language diversity and the effect on educational outcomes in Pakistan necessitates an answer that has not been explored. This research focuses on bridging this literature gap in Pakistan, a multilingual nation, by bringing evidence of the significance of language diversity concerning educational outcomes. However, incorporating language diversity in the presence of a colonial legacy impedes the successful implementation of teaching in the mother language in public schools in Pakistan.

2.1.3 Policy Relevance

Access to education in one's mother language is considered a fundamental right from a Policy standpoint. The UN declaration (1992) on the rights of persons belonging to any national, ethnic, religious, and linguistic groups have the right to receive instruction in their mother language. The 1960 Convention against Discrimination in Education also protects the linguistic rights of minorities to "carry out their educational activities in their mother language. Moreover, UNESCO's Education for All initiative in 1990, mother language-based education policies gained momentum in several countries that have a growing body of research on the positive effects of mother language instruction on children's cognitive development, participation, and learning outcomes, enrolment, and success in schools (Trudell, 2016; Kosonen, 2005), and reducing inequalities for disadvantaged groups incorporating mother language as the language of instruction for all primary students.

Despite widespread international recognition and evidence of the benefits of mother language-based education, UNESCO (2016) contemplated that 40 percent of children do not have access to education in their mother language. Furthermore, according to Ethnologue, a language database, approximately 35 percent of children worldwide commence their education in a language that is not their mother language. Knowledge acquisition is a fundamental component of human well-being; however, a significant proportion of children worldwide attend educational institutions where the language of instruction (LOI) differs from their mother language, which impedes their capacity to

acquire knowledge and excel academically. Refer to the interactive map presented below to ascertain the impact of this issue on individual countries.

Moreover, the Ethnologue language database demonstrated that 35 percent of children begin their education in an unfamiliar language. Learning is crucial to human flourishing. However, research shows that over one-third of children spend their school days in classrooms where the language of instruction (LOI) is not used at home. Many of these students experience difficult setbacks, which curtail their ability to learn and perform well academically.

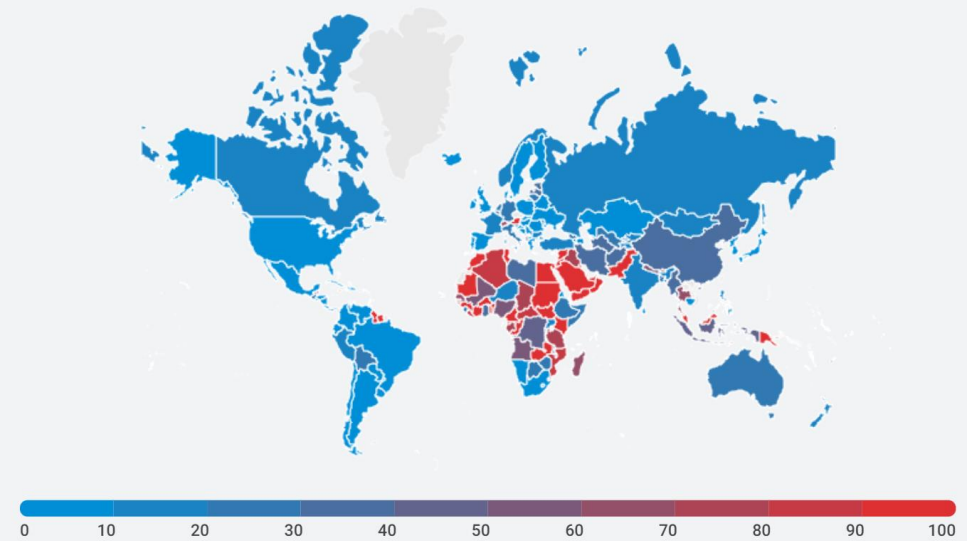


Figure 2-2: Percent of Children Whose First Language is not A Language of Instruction in Their Country[3]

Similarly, after 75 years of independence in Pakistan, "recognizing language diversity in education" and "language choice in education" are contentiously debated, closely tied to national and political identities, and exacerbated by ethnolinguistic diversity and resource constraints. Education systems in Pakistan prioritize using national or 'global' languages, such as English, to exclude speakers of minority language groups. In Pakistan, 93 percent of the students are not getting an education in their mother language (Ethnologue, 2021). Some consequences of attempting to educate students in a language they do not fully comprehend include limited comprehension, poor performance, high dropout rates, and expanding inequalities for vulnerable and marginalized groups.

On the other hand, historical evidence suggests that successive government policies in Pakistan have viewed linguistic diversity as a liability rather than an asset, resulting in

[3] https://www-ethnologue-com.eu1.proxy.openathens.net/insights/languages-of-instruction/

an acute decline of mother languages in more literate domains such as education (Tsui & Tollefson, 2004). However, in Pakistan, language diversity is considered a problem in education; therefore, English language instructions are presented as the only viable explanation for their children's education, which signifies many things, including elitism, social power, and a passport to prestigious working opportunities (Rahman, 2020a). This research draws on and analyzes data through the lens of other related critical language policy concepts by addressing these tensions in Pakistan, where language diversity is not considered in language instruction, and encourages policymakers to actively consider language diversity in the language in education policy. In addition, this study aims to provide recommendations for adopting a comprehensive approach that considers the language of instruction at all levels of education, from early childhood education to primary and secondary schools and higher institutions.

2.1.4 Research Objective

Children learn better when they understand better Brock-Utne (2010). However, it is the most significant and the least prioritized issue. Language is integral to communication, and children are taught to act, believe, and contribute to their communities (Chall, 1989). These language skills determine the Individual's social and economic status, education efficiency, and other aspects of life. Based on theoretical and empirical facts and the identified research gap, this chapter is focused on the following core objective.

1. Based on the theoretical contemplations, to bring empirical evidence on the relationship between language diversity and educational outcomes, at various levels of education, i.e., primary, secondary, and higher at the district level in Pakistan.

2.1.5 Research Hypothesis

This section aims to examine the relationship between language diversity and educational outcomes at various levels of education in Pakistan. The following hypotheses have been formulated to explore these relationships in a structured manner.

Null Hypothesis 1 (H_0): There is no significant relationship between language diversity and educational outcomes at the district level in Pakistan.

Alternative Hypothesis 1 (H_A): There is a significant relationship between language diversity and educational outcomes at the district level in Pakistan.

By assessing the influence of linguistic diversity on primary, secondary, and higher education, the study seeks to provide empirical evidence on how this socio-cultural factor impacts academic performance across districts in Pakistan. This analysis further conducted analysis abed on following three hypotheses.

Hypothesis 1A:

H_0: There is no significant relationship between language diversity and educational outcomes at the primary education level in districts across Pakistan.

H_A: There is a significant relationship between language diversity and educational outcomes at the primary education level in districts across Pakistan.

Hypothesis 1B:

H_0: There is no significant relationship between language diversity and educational outcomes at the secondary education level in districts across Pakistan.

H_A: There is a significant relationship between language diversity and educational outcomes at the secondary education level in districts across Pakistan.

Hypothesis 1C:

H_0: There is no significant relationship between language diversity and educational outcomes at the higher education level in districts across Pakistan.

H_A: There is a significant relationship between language diversity and educational outcomes at the higher education level in districts across Pakistan.

This disaggregation by education level (primary, secondary, and higher) allows a comprehensive understanding of how language diversity impacts students' achievements at different stages of their academic journey.

2.2 Theoretical and Empirical Literature Review

Extensive literature is available on the impact of language diversity on educational achievements. The relationship between the acquisition of knowledge and economic gains is conditional upon the quality of education provided (Coombs, 1985), and it is essential to consider language diversity when assessing these results. Furthermore, language serves as a medium of communication that has the power to influence and convey the values, beliefs, and customs that define our lives and individual identities (Alesina & Reich, 2015).

2.2.1 The Economics of Language: A Brief

The origin of language economics as a separate discipline is usually credited to Marschak (1965), who explicitly introduced economic concepts such as costs and benefits into linguistic analysis. However, the following definitions describe the economics of language:

“Economics of Language is the study of the determinants and consequences of language proficiency using the methodology and tools of economics. The methodology of economics is the scientific method applied to maximizing behavior” (Friedman, 1953).

The economics of language refers to the paradigm of mainstream theoretical economics and uses the concepts and tools of economics in the study of relationships featuring linguistic variables; it focuses principally, but not exclusively, on those relationships in which economic variables also play a part (Grin, 1999). Fishman et al. (1968) comprehended language diversity into economic interactions with a long-standing legacy in the education context (Humboldt, 1988). Subsequently, (Pool, 1972) posited that economic interactions are fundamentally intertwined with culture and diversity. In addition, some other researchers have emphasized the significance of language in shaping social, political, and economic consequences (Bretton, 1976).

Greenberg (1956) recognized the potential links between language and economics by contributing to the field, which developed language diversity indices incorporating linguistic distances and non-linguistic factors such as political, economic, geographic, and historical considerations. The notion was subsequently employed by various scholars such as (Alesina et al., 1999; Alesina & Ferrara, 2005; Dale-Olsen & Finseraas, 2020; Easterly et al., 1997; Fearon, 2003a; Humboldt, 1988).

2.2.2 Language Diversity and Education

Furthermore, an Individual's language reflects an individual's ethnic identity and the culture of one's community and strengthens a linguistic group (Global Educational Monitoring Report, 2016). Based on the *"World Crisis in Education"* in the 1980s, "The issue of what language or languages to adopt as the medium of instruction at successive levels of education is one of the most difficult and politically explosive issues schools face in many countries. Paradoxically, however, the choice of language of instruction is also one of the least appreciated of all the major educational problems that come before

international forums" (Coombs, 1985). In addition to this language of instruction in linguistically diverse societies, language choices are political issues (Pinnock & Vijayakumar, 2009).

Researchers have investigated the role of various factors in an educational context, e.g., social class, ethnicity, and language background, and these factors become increasingly critical predictors for one's educational outcomes (Herbers et al., 2012) irrespective of the income level of the Individual (Williams, 2003). Education that concentrates on the diverse socioeconomic backgrounds of individuals leads toward more equitable educational outcomes (Tupas, 2015), while the educational outcomes lead to favorable results far behind the front of the linguistically diverse background not considered (Lipman, 2004). Socioeconomic status is linked with high-quality education with more educational resources (Williams, 2014), but the language of instruction is the critical determinant of the quality of Education (Foorman & Nixon, 2006; Mac Iver & Kemper, 2002; Williams, 2014). Therefore, the language of instructions in schooling is critical (Herbers et al., 2012; Sleeter, 2012).

The increasing levels of linguistic diversity have significantly affected the quality of Education (Agirdag et al., 2011). The language heterogeneity among various population groups determines the economic and educational outcomes (Agirdag et al., 2011; Perez & Hirschman, 2009). Many studies have examined how a school's ethnic diversity affects educational outcomes (Agirdag et al., 2011; Perez & Hirschman, 2009). Some are the proponents of the existence of a positive link between linguistic diversity and gain in education established that ethnically diverse schools offer more opportunities to interact with different linguistic and cultural backgrounds by providing them with a gain of cultural assets (Driessen, 2010; Meeuwisse et al., 2010), While the opponents of the view of diversity, conclude that ethnic diversity inversely affects the quality of education, and hence the economic productivity (Bellmore et al., 2012; Raabe & Beelmann, 2011). Various linguistically diverse societies tend to experience higher tensions among groups than linguistically homogeneous societies; thus, educational outcomes might be enhanced if the student's linguistic background is considered critical in education (Maume & Wilson, 2015).

South Asian economies provide English language teaching and learning and use it as a medium of instruction as these economies remain the legacy of British colonialism.

Pakistan still reflects colonialism in its education policies regarding the language of instruction even after gaining independence many decades ago (Rahman & Singh, 2020; Rahman, 2020b). Therefore, all the economic and educational development is based on the critical considerations of the language in education policy at various levels of Education (Hamid et al., 2013; Rahman & Singh, 2020).

2.2.3 Mother Language Instructions in Education

Post-independence, numerous ex-colonies have encountered challenges regarding the decision to either persist with the colonial language in their education system or switch back to their Indigenous language. In certain nations, like Pakistan, the language of instruction in schools persisted as the colonial language. Teaching students in their mother language appears to be an unambiguous decision for specific individuals. However, research indicates that children who exhibit an established understanding of their mother language before entering school demonstrate enhanced literacy skills. Extant research has generally established the significance of children's mother language concerning their individual and academic growth (Cummins, 2000; Macaro et al., 2018; Skutnabb-Kangas, 2000). When parents engage in activities with their children, such as narratives or discussing topics, facilitating the development of their mother language's vocabulary and concepts, it can enhance their children's willingness to learn and academic achievement (Meighan, 2023).

When children acquire knowledge through their mother language, they acquire intellectual skills and concepts equally applicable to their general cognitive development. UNESCO (2008) determined that applying the mother language for educational purposes holds significant cognitive and emotional benefits. Krishna et al. (2017) asserted that various psychological, social, and educational experiments have demonstrated that learning is more significant, expeditious, and effective when conducted through the mother language medium. Utilizing students' mother language in the classroom for imparting subject content has been found to develop students' cognitive abilities (Dekker & Young, 2005).

Empirical evidence supports the notion that children acquire knowledge most effectively when initially instructed in their mother language, which serves as a basis for subsequent bilingual and multilingual educational pursuits. Thomas and Collier (2002) concluded that six to eight years of language education is essential to acquire the necessary

literacy and verbal skills for academic success in secondary education (Collier, 1987; Liu, 2023; Moats, 1994). However, acquiring a foreign language, such as a lingua franca, is not impeded in children who receive primary school instruction primarily in their mother language (Yi, 2022).

Developing fluency and literacy in one's mother language is a fundamental cognitive and linguistic basis for acquiring proficiency in other languages. When primary school students receive formal instruction in their mother language and gradually shift towards academic learning in their foreign language, they exhibit rapid proficiency (Van den Boer & Zeguers, 2022). Students can emerge as proficient bilingual learners with continued opportunities to enhance their primary language abilities during their secondary education. In this case, it is plausible that their primary language acquisition is not harmed; however, many other transition strategies typically involve introducing the dominant language as the primary mode of instruction in the third year of primary education. This practice has been linked to less favorable outcomes in acquiring mother and second languages (Jaekel et al., 2017). A thorough examination is necessary to formulate efficacious language policies for early childhood and primary education. The research indicates that the extent to which children can retain their mother language while acquiring additional languages is contingent upon various interrelated factors. However, it is crucial to offer them continuous formal education in their first language to cultivate their abilities in reading and writing. Moreover, it is essential to expose them to favorable parental attitudes toward preserving their mother language for cultural identification and practical purposes (Grimshaw et al., 1998; Krashen & Seliger, 1975).

2.3 Data Sources and Methodology

2.3.1 Data sources

District Census Reports (2017) published by PBS are collected and cross-referenced with Ethnologue Languages of the World to provide empirical evidence regarding the role of language diversity in determining educational outcomes. In addition, educational outcomes are gathered from the PSLM (2019/20) survey and cross-verified with the World Inequality Database on Education (2019) and the Annual School Census 2017-18 Report at the district level. In addition, other socioeconomic variables are measured by the Pakistan Bureau of Statistics (PBS) using the PSLM (2019/20) survey.

2.3.2 Variables of Study

The core variables of the research are language diversity and education enrollment in Pakistan. Data is collected and utilized at various levels of education at the district level. Language diversity is measured by using the different indexes used in the literature.

Table 2-2: Data Sources and Variables of the Study

Variable	Abb.	Definition	Used in literature	source	Source link
Herfindahl Language Concentration Index	HLCI	The probability that two randomly selected individuals from the population belong to different language groups	(Alesina et al., 2003; Easterly & Levine, 1997) (Easterly et al., 1997; Easterly & Levine, 1997) (Alesina et al., 1999; Alesina & Ferrara, 2005) (Dale-Olsen & Finseraas, 2020)	Pakistan population census 2017	https://www.pbs.gov.pk/content/final-results-census-2017
Language Diversity index	LDI	The probability that two randomly selected individuals from the population belong to similar language groups	(Alesina et al., 2003) (Easterly et al., 1997; Easterly & Levine, 1997) (Alesina et al., 1999; Alesina & Ferrara, 2005) (Dale-Olsen & Finseraas, 2020)	Pakistan population census 2017	https://www.pbs.gov.pk/content/final-results-census-2017
Primary Education Enrolment	EEP	Number of students enrolled in Primary education from grades 1 to 5, where children are admitted to schools at 5 and over.	(Hou, 2022) (Easterly & Levine, 1997)	PSLM 2019/20	https://www.pbs.gov.pk/content/pslm-district-level-survey-2019-20-microdata
				Pakistan Education Statistics 2017/2018	http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202017-18.pdf
Secondary Education Enrolment	EES	Number of students enrolled at Secondary education, (1) middle-level education 6 to 8 grades (2) secondary-level 9 to 10 grades (3) the higher secondary education of grades 11 to 12	(Hou, 2022) (Easterly & Levine, 1997)	PSLM 2019/20	https://www.pbs.gov.pk/content/pslm-district-level-survey-2019-20-microdata
				Pakistan Education Statistics 2017/2018	http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202017-18.pdf

Education enrolment at Higher education	EEH	Number of students enrolled in universities and post-graduate institutes, which include BA/BSc, BS, MS/MPhil, and PhD level.	(Hou, 2022) (Easterly & Levine, 1997)	PSLM 2019/20	https://www.pbs.gov.pk/content/pslm-district-level-survey-2019-20-microdata
				Pakistan Education Statistics 2017/2018	http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202017-18.pdf
Log of educational expenditures on education per student	LEEX	Expenditures per student based on annual estimations as a ratio to total income earned a year	(Fiala & Delamonica, 2022; Rajkumar & Swaroop, 2008) (McMahon, 2000)	PSLM 2019/20	https://www.pbs.gov.pk/content/pslm-district-level-survey-2019-20-microdata
Log of employment income	LNEY	Total yearly income earned by the household from different employment sources	(Bove & Elia, 2017)	PSLM 2019/20	https://www.pbs.gov.pk/content/pslm-district-level-survey-2019-20-microdata
Human development index	HDI	Human capital skills embodied in individuals	(Anand & Sen, 2000) (Ranis et al., 2000)	MICS 2018/19	https://microdata.worldbank.org/index.php/catalog/4181
Average household size	AHS	Average household size	(Duncan et al., 1994) (Hanushek & Woessmann, 2012)	Pakistan population census 2017	https://www.pbs.gov.pk/content/final-results-census-2017
Population growth rate	PGR	Annual population growth rate	(Barro & Lee, 1994) (Barro & Lee, 2013) (Bove & Elia, 2017)	Pakistan population census 2017	https://www.pbs.gov.pk/content/final-results-census-2017
Dummy Variable Province (Punjab, Sindh, KP, Baluchistan)	PP, PS, PK, PB	Dummy Variable	(Alesina et al., 2003; Easterly & Levine, 1997) (Alesina et al., 1999; Alesina & Ferrara, 2005)		

Note: Data is compiled for 124 districts of Pakistan

2.3.2.1 Language Diversity

In recent decades, economists have exhibited a growing interest in investigating the impact of diversity on the economic and social progress of societies comprised of multiple distinct demographic groups. (Hjort, 2014b) assert that ethnic and cultural diversity was pivotal in developing urban areas. Nonetheless, an alternative strand of scholarly research, initially proposed by (Mauro, 1995), and subsequently developed by (Easterly & Levine, 1997; Ginsburgh & Weber, 2014), posited that it is necessary to consider the estimation of diversity and the implementation of an appropriate index that effectively captures societal fractionalization. Since Gini's seminal work in 1912, various diversity indices have been employed to assess the extent of dissimilarities among groups of individuals, regions, and nations across social, economic, cultural, and other domains. The Gini index, employed initially as a metric for assessing income inequality, was reinterpreted by Simpson in 1949. The measure of industry concentration, commonly referred to as the inverse Hirschman-Herfindahl index (Hirschman, 1945, Herfindahl, 1950), has also been utilized by (Greenberg, 1956) to quantify linguistic diversity. The index's value is determined by its capacity to quantify the likelihood of two individuals selected randomly from a given society belonging to distinct groups. Consequently, the most empirical literature on linguistic diversity used the index of diversity introduced by (Greenberg, 1956), and the other widely used index of ethnolinguistic fractionalization (ELF) was constructed by (Hudson & Taylor, 1972).

1) Herfindahl linguistic concentration index

The first is the classical linguistic diversity index, also known as the Herfindahl index. It assesses the likelihood of two randomly selected individuals in the population belonging to distinct linguistic groups.

$$HLCI = \sum_{i} s_i^2$$

Equation 2-1

Where si is the share of group i over the population's total, if we consider language diversity, si is the proportion of people who speak a language i (or belong to language group i).

The Herfindahl concentration index can quantify how concentrated or dispersed language speakers are among different languages within a region or population. A higher HLCI value indicates less diversity, meaning a few languages dominate. A lower value suggests a more even distribution among languages; for instance, in a region with four languages spoken by different population proportions, HLCI assesses the concentration of language speakers in that region. In the context of language diversity, the HLCI measures how concentrated or evenly distributed speakers are among various languages in a population. Higher HLCI values indicate less language diversity, as most of the population speaks a few dominant languages. In comparison, lower HLCI values indicate greater language diversity, with a more even distribution of speakers among various languages.

2) Linguistic Diversity Index (LDI)

Most empirical literature utilized the linguistic fictionalization index (Hudson & Taylor, 1972). Subsequently, Easterly and Levine (1997) used as a measure of fragmentation the probability that two randomly drawn individuals from the unit of observation belong to two different groups. The diversity (fractionalization) index LDI captures the degree to which a society is split (diverse) into distinct language groups.

$$LDI = 1\text{-}\sum_{k=1}^{k}(p)_{k}^{2}$$

Equation 2-2

Where p_k is the fraction of the total population speaking the language k, K is the total number of languages in a country. The LDI emphasizes language diversity rather than concentration. A higher LDI value (closer to 1) indicates greater linguistic diversity, meaning there is a higher probability that two randomly selected individuals speak different languages. A lower LDI value suggests less diversity, indicating that most of the population speaks the same or a few languages. For instance, in a country with many languages spoken by similar proportions of the population, the LDI would be high, reflecting a high level of linguistic diversity. Conversely, if the vast majority speak one language, the LDI would be low, indicating low diversity.

Consequently, the HLCI measures the concentration of language speakers and is particularly sensitive to how many people speak each language, with higher values indicating

less diversity. In contrast, the LDI measures diversity or fragmentation, focusing on how spread-out language groups are across the population, with higher values indicating greater diversity. HLCI is calculated by summing the squared shares of each language group, making it more sensitive to the size of the largest groups. LDI subtracts the sum of squared shares from 1, directly measuring linguistic diversity or fragmentation likelihood. The HLCI is useful when the goal is to understand the dominance or concentration of a few languages within a population. In contrast, the LDI is better suited for evaluating the overall linguistic diversity within a population and understanding how fragmented a society is regarding language.

This research has utilized two language diversity indexes used in the literature (Desmet et al., 2016; Greenberg, 1956; Montalvo & Reynal-Querol, 2005). District-level Language diversity indexes are estimated using district-level data in Pakistan to achieve the research objectives. However, empirical models incorporate various Linguistic diversity indexes to check outcomes' robustness (Alesina & Ferrara, 2005).

2.3.2.2 Education Measures

i. Education Enrollment

Barro's (1998) and Barro and Lee's (2001) research utilized UNESCO's dataset to examine the relationship between income growth and education enrollment at primary, secondary, and higher education levels. (Hanushek & Kimko, 2000) utilized examination scores to measure educational excellence. The current research extracted data on Total Education Enrollment (EET), Primary Education Enrollment (EEP), Secondary Education Enrollment (EES), and Higher Education Enrollment (EEH) from PSLM 2017/18 at the district level. The enrollments for each level of education represent the total number (counts) of students currently enrolled at that stage. Chapter 1 explained each education category's definition.

ii. Expenditures per student

Expenditures per student as a share of GDP per capita (McMahon, 2000) highlighted the spending per student as a percentage of income per capita, as a measure of costs per student or unit costs. Education cost per student specified education level is as under:

$$s_i = \frac{\left(\frac{P_i}{S_i}\right)}{\left(\frac{I}{T}\right)}$$

Equation 2-3

Where,

Pi is expenditures at a certain education level; Si is the number of students enrolled in that specific education level; I is the total income, and T is the total population. This ratio can also be expressed as:

$$s_i = \left(\frac{P_i}{I}\right)\left(\frac{N}{S_i}\right)$$

Equation 2-4

It demonstrates that the ratio increases if public spending toward the education level, i.e., primary, secondary, and higher, increases relative to income. On the other hand, if students enrolled in this education level increase compared with the country's total population, the ratio decreases. McMohan (2000) stated that higher unit costs (per student) reflect quality education (and enhance growth; conversely, it also reflects inefficiency with too many resources spent per student (and retard growth, e.g., too much is spent per student, especially if few are enrolled.

2.3.3 Methodological Underpinnings

The Poisson distribution was derived as a limiting case of the binomial distribution (Poisson, 1837). Early applications include the classic study of the annual number of deaths in the Prussian army from being kicked by mules (Bortkiewicz, 1898). The statistical analysis of counts within the framework of discrete parametric distributions for univariate independently and identically distributed random variables has a long and rich history (Chandra et al., 2013; Hanley & Bhatnagar, 2022; Johnson et al., 2005; Wallis, 1936). During the past few decades, Poisson regression among the regression methods has found extensive use in economics and its various subfields. For instance, in organizational ecology, Poisson and the related negative binomial regression models are extensively utilized (Hannan & Carroll, 1992). Similarly, in demography, incorporating heterogeneity in individual shortcomings into analyses extensively used the Poisson regression model (Manton et al., 1981).

Linear regression models for continuous outcome data analysis assume that the errors usually are independently and identically distributed, with a mean of zero. However, discrete data follows a highly skewed distribution, so it is appropriate to investigate alternative analytical methods, perhaps not conforming to the underlying assumptions of normality of error term. Alternatively, the normality assumption can be addressed by introducing data transformations, although data transformations are not without inherent challenges; for instance, they fail to produce normality of distribution and can complicate the interpretation of regression coefficients due to their estimation on varying scales. Chang et al. (2010) have provided evidence that the conventional ordinary least squares (OLS) linear regression model encounters challenges when the error distribution cannot be adjusted to approximate a widely recognized distribution.

Thus, alternative methods, such as Poisson regression, are required to model count variables. The Poisson distribution postulates that the count-dependent variable exhibits equality between its mean and variance. Poisson (1837) defined univariate Poisson distribution with a notable and restrictive property that its mean and variance of a dependent variable must be identical and equal to $E[y_i] = Var[y_i] = \lambda$ (Cox, 1983; Dean & Lawless, 1989). The Poisson regression model considered in this study is the one used by (Miaou, 1994):

$$p(Y_i = y_i) = p(y_i) = \frac{\mu_i^{y_i} e_i^{-\mu_i}}{y_i!}$$

$$\boldsymbol{i = 1, 2, 3, \ldots\ldots\ldots\ldots, n}$$

Equation 2-5

Where,

$$\mu_i = E(y_i) = v_i (e^{x'\beta})$$

$$\boldsymbol{i = 1, 2, 3, \ldots\ldots\ldots\ldots, n}$$

Equation 2-6

$$= v_i (e^{\sum_{j=1}^{k} x_{ij}\beta_j})$$

$$\boldsymbol{i = 1, 2, 3, \ldots\ldots\ldots\ldots, n}$$

Equation 2-7

Where β is the K×1 vector of unknown regression parameters, the transpose of which is denoted by

$$\beta' = (\beta_1, \beta_2, \beta_3, \dots\dots\dots\dots \beta_k)$$

Equation 2-8

This model assumes that y_i i = 1, 2, . . ., n, are independently and Poisson distributed with mean μ_i. The expected value of $E(y_i)$ in this model is proportional to v_i . The model also assumes an exponential rate function,

$$(\lambda_i) = \frac{E(y_i)}{(e^{x'\beta})}$$

Equation 2-9

Which ensures that the value of the dependent variable is always non-negative. This type of rate function has been widely employed in the statistical literature and is very flexible in fitting different types of count data (Cox & Lewis, 1966; Frome et al., 1990).

Nonetheless, numerous investigations on distinct dependent variables contemplated that the sampling distribution frequently exhibits overdispersion concerning the Poisson distribution, which occurs when the variance exceeds the mean model (Dean & Lawless, 1989). Despite these widespread applications, specific properties of the Poisson regression model and its relatives are not widely understood among economists, especially the structural assumptions these models make about the data they are applied to. For instance, although the notion that the negative binomial regression model should be adopted "when the variance of the dependent variable is significantly larger than the mean" is generally appreciated, a clear understanding of precisely what this means and the implications of the then chosen probability distribution for the data are often lacking. In educational enrolment design studies, the overdispersion could come from several possible sources, e.g., omitted variables, uncertainty in exposure data and covariates, and a nonhomogeneous study environment (Miaou, 1994). Similarly, knowledge of recent developments in this statistical methodology considerably relaxes the constraints of the conventional Poisson and negative binomial, which is not widespread.

Consequently, a standard generalization of the Poisson is the negative binomial distribution. It was derived by Greenwood and Yule (1920) due to unobserved heterogeneity.

It is imperative to utilize models that accommodate a more significant variance and overdispersion, which entails the adjustment of standard errors and test statistics. Therefore, an alternative methodology for analyzing count data, which avoids the problems inherent in the previously described methods, is to fit a negative binomial regression model (Abdel-Aty & Radwan, 2000; Berk & MacDonald, 2008; Land et al., 1996).

2.3.3.1 Negative Binomial Regression

The Poisson distribution was rejected because the mean and variance of the dependent variables are different, indicating substantial overdispersion in the data. Such over-dispersion suggests a Negative Binomial model. The Negative Binomial modeling approach is an extension of the Poisson regression methodology and allows the variance of the process to differ from the mean (Berk & MacDonald, 2008; Land et al., 1996). The usual functional form for the negative binomial regression model is given by

$$\log \lambda_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \cdots + \beta_k x_{ik} + \sigma\varepsilon_i$$

Equation 2-10

Or

$$\lambda_i = e^{\beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \cdots + \beta_k x_{ik} + \sigma\varepsilon_i}$$

Equation 2-11

Where λ_i Is the expected value of the outcome variable yi for subject i, xi are the independent variables with corresponding regression coefficients βk, and σεi is the disturbance term. The property that the variance of the Poisson distribution equals its mean is, in practice, quite restrictive. The negative binomial distribution offers a remedy to this problem. Following methodological design, the negative binomial distribution and the resulting probability distribution are as follows:

$$p(Y_i = y_i) = p(y_i) = \left(\frac{\xi\left(y_i + \frac{1}{\alpha}\right)}{\xi\left((y_i + 1)\xi\left(\frac{1}{\alpha}\right)\right.}\right)\left(\left(\frac{1}{1 + \alpha\mu_i}\right)^{\frac{1}{\alpha}}\right)\left(\left(\frac{\alpha\mu_i}{1 + \alpha\mu_i}\right)^{y_i}\right)$$

$$i = 1, 2, 3, \ldots \ldots \ldots \ldots, n$$

Equation 2-12

Where,

$$\mu_i = E(y_i) = v_i\,(e^{x'\beta})$$

$$i = 1, 2, 3, \ldots\ldots\ldots\ldots, n$$

Equation 2-13

$$= v_i\,(e^{\sum_{j=1}^{k} x_{ij}\beta_j})$$

$$i = 1, 2, 3, \ldots\ldots\ldots\ldots, n$$

Equation 2-14

And the variance of y_i is

$$Var(y_i) = \mu_i + \alpha\mu_i$$

Equation 2-15

Compared with the Poisson model, this model has an additional parameter α where $\alpha \geq 0$ is usually referred to as the dispersion parameter, from eq. (8) one can see that this model allows the variance to exceed the mean. Also, the Poisson regression model can be regarded as a limiting model of the negative binomial regression model as α approaches 0.

The choice between the Negative Binomial model and the Poisson model can largely be determined by the statistical significance of the estimated coefficient, α is not significantly different from zero (Gardner et al., 1995). The Negative Binomial model reduces to a Poisson regression with $E[y_i] = Var[y_i] = \lambda$. If α is significantly different from zero, then the Negative Binomial is the correct approach (Lawless, 1987).

2.3.3.2 Endogeneity in Recursive Models

The occurrence of count regressions with endogenous regressors is a common phenomenon. Neglecting the feedback effect of the endogenous regressor on the response variable and conditioning the outcome merely on variables that are jointly determined with it results in parameter estimates that lack consistency. The estimation methodology ought to incorporate the possibility of stochastic interdependence between the response variable and endogenous covariates. When contemplating this matter, it is pertinent to consider the extant body of literature about estimating simultaneous equations in non-linear models, as expounded by (Amemiya, 1985).

In linear models that include additive errors, estimating models with endogenous regressors through instrumental variable (IV) and generalized method of moments (GMM) techniques has been well-established, contingent upon the availability of valid instruments. Various methodologies have been postulated for non-linear models. The degree of variability in functional form assumptions and the presence of additive or separable error terms significantly impact the outcome. A body of research about semiparametric and nonparametric regression has been farmed to reduce dependence on robust assumptions. Blundell and Powell (2004) evaluated the significance of separable errors and contrasted the IV and control function estimators. The question of discreteness is an additional challenge when dealing with count data. Chesher (2010) explored essential conditions for the point identification of single equation models through instrumental variable estimation.

2.3.3.3 Control Function Approach

Control function estimation is a two-step method introduced by (Heckman & Robb Jr, 1985). Our general presentation follows (Blundell & Matzkin, 2014) such as:

$$y_1 = g(x, y_2, \mu_1)$$

Equation 2-16

$$\boldsymbol{y_2 = h(z, \mu_2)}$$

Equation 2-17

is specified where z includes x plus at least one extra regressor and μ_1 and $\mu_2$are correlated, so y_2 is endogenous in the first equation. The interest lies in estimating a function $\alpha\ (x, y_2)$. In this model, if μ_1 is known, then the model for y_1 can be worked with directly without an endogeneity problem.

A control function defines a function of μ_1 that depends on observables, and conditioning on this eliminates the endogeneity. Formally, a function $k(z, y_2)$ is a control function if it allows recovery of $\alpha\ (x, y_2), \mu_1$ is independent of y_2 conditional on a known function $\rho(k(z, y_2 0)$, and K $(\cdot)$ is identified. Finding a control function is not always possible, and it may rely on strong distributional assumptions when it does exist. The least squares estimate from the regression of y_1 on x, y_2, and μ^2 is easily equivalent to the two-stage least squares estimator. Consider the following model:

$$\mathrm{E}\,\lambda_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \cdots + \beta_k x_{ik} + \sigma\varepsilon_i$$

Equation 2-18

$$E(y_{1i}|xi, y_{2i}, \mu_{1i}) = \exp(\beta_1 x'_i + \gamma_1 y_{i2} + \mu_{1i}$$

Equation 2-19

$$y_{2i} = \beta_2 z'_i + \mu_{2i}$$

Equation 2-20

where z_i includes at least one variable not in $x_i$xi. If the errors μ_1 and μ_2 are correlated, then y_2 and μ_1 are correlated, so Poisson regression of y1 on x and y2 yields inconsistent parameter estimates. In this recursive model, however, the problem would disappear if the error u1 was observed, since then one can do Poisson regression of y_1 on x, y_2, and u2. Wooldridge (1997b) assumes that

$$\mu_{1i} = \rho\,\mu_{2i} + \varepsilon i,$$

Equation 2-21

Where εi is independent of u2i, which implies

$$(y_{1i}|xi, y_{2i}, \mu_{1i}) = \exp\left(\beta_1 x'_i + \gamma_1 y_{i2} + \rho\mu_{2i}\right)$$

Equation 2-22

And

$$y2i = z'_i\beta_2 + \mu_{2i}$$

Equation 2-23

Poisson regression of y_1 on x, y_2, and μ_{2i}, where $u\hat{}2i = y2i - z\,i\beta\hat{}2$ and $\beta\hat{}2$ is the estimate from OLS estimation of $y2\ on\ z$, which yields consistent estimates of β1 and γ 1 under assumptions E [y1i|xi, y2i, u1i] = exp (x iβ1 + γ 1y2i + u1i) AND y2i = z iβ2 + u2i, though statistical inference which is based on standard errors that control for the estimation error in u^. Wooldridge (1997) notes that under the null hypothesis of no endogeneity, $H0$: $\rho = 0$, there is no need to correct for two-step estimation – one can do a t-test based on ρ with the usual robust standard errors for Poisson regression. Terza, Basu, and Rathouz (2008) call this method two-stage residual inclusion and provide many relevant references. More generally, the method is called a control function approach since the additional regressor u^2 is included

as a control for the endogeneity of y2. This method requires the stronger assumption that ε is statistically independent of u2 and not just mean independent for non-linear models.

Furthermore, this research has utilized different measures of linguistic diversity to incorporate different assumptions about diversity utilizing various established measures of language diversity to check, under various assumptions, how educational outcomes respond to language diversity (Desmet et al., 2016; Greenberg, 1956; Montalvo & Reynal-Querol, 2014) (Laitin & Ramachandran, 2016).

Empirical Model Specification: contemplation between language diversity and educational outcomes

This section presents a comprehensive model examining how language diversity impacts educational enrollment across different levels of education. While empirical models typically account for the influence of various control variables, such as educational spending and household income, on enrollment rates (Clegg & Milligan, 2021; Mohanty, 2019; Mohanty et al., 2009; Rahman et al., 2019); however, the role of language diversity in shaping education enrollment has not been widely considered in Pakistan. To address this gap, this chapter introduces six empirical models specifically designed to explore the relationship between language diversity and educational enrollment in the Pakistani context.

Model 1 explores the impact of language diversity, measured by the Herfindahl HLCI, on primary education enrollment (EEP). In addition to language diversity, Model 1 includes several control variables to provide a more nuanced analysis. These variables are the logarithm of employment income (LNEY), the logarithm of education expenditures (LEEX), the Human Development Index (HDI), average household size (AHS), and the population growth rate (PGR). Additionally, the model incorporates dummy variables for the provinces of Punjab (PP), Khyber Pakhtunkhwa (PK), Sindh (PS), and Baluchistan (PB), with Khyber Pakhtunkhwa (PK) serving as the base category. These controls allow the model to isolate the specific impact of language diversity on educational enrollment, controlling for other socio-economic and regional factors.

Model 1

$$\boldsymbol{EEP = \alpha_0 + \alpha_1 HLCI_i + \alpha_2 LEEX_i + \alpha_3 LNEY_i + \alpha_4 HDI_i + \alpha_5 AHS_i + \alpha_6 PGR_i + \alpha_7 PP_i + \alpha_8 PS_i + \alpha_9 PB_i + \varepsilon_i}$$

` **Equation 2-24**

Model 2 substitutes total education enrollment with secondary education enrollment (EES) while maintaining the same control variables as in the first specification. This adjustment allows for examining the specific impact of language diversity on secondary education enrollment. The following equation represents the second specification, incorporating these controls to assess how factors such as language diversity, income, human development, household size, population growth rate, and provincial differences influence secondary education enrollment.

Model 2

$$EES = \beta_0 + \beta_1 HLCI_i + \beta_2 LEEX_i + \beta_3 LNEY_i + \beta_4 HDI_i + \beta_5 AHS_i + \beta_6 PGR_i + \beta_7 PP_i + \beta_8 PS_i + \beta_9 PB_i + \mu_i$$

Equation 2-25

The third model specification replaces secondary education enrollment with higher education enrollment. Despite this change in the dependent variable, all other control variables remain the same as those used in the previous models. This approach allows for a focused analysis of how language diversity and other socioeconomic factors influence higher education enrollment while ensuring consistency across the models for comparative purposes.

Model 3

$$EES = \gamma_0 + \gamma_1 HLCI_i + \gamma_2 LEEX_i + \gamma_3 LNEY_i + \gamma_4 HDI_i + \gamma_5 AHS_i + \gamma_6 PGR_i + \gamma_7 PP_i + \gamma_8 PS_i + \gamma_9 PB_i + e_i$$

Equation 2-26

The specification of these three models—focusing separately on primary, secondary, and higher education enrollment—allows for a nuanced understanding of how language diversity and other socio-economic factors affect educational outcomes at different levels of education. By examining each enrollment level independently, the models can reveal distinct patterns and impacts that language diversity might have across different educational stages.

Primary, secondary, and higher education have unique characteristics, challenges, and determinants that could influence enrollment differently. For instance, the factors affecting primary education enrollment, such as basic accessibility and early childhood interventions, might differ significantly from those influencing higher education, which could be more affected by socioeconomic status, regional disparities, and labor market demands.

Moreover, this research has further specified three additional models using the LDI instead of the Herfindahl Language Concentration Index (HLCI) to investigate the impact of language diversity on educational enrollment. Models 4, 5, and 6 retain the same set of independent variables as those used in the previous models, ensuring consistency in the analysis. By substituting LDI for HLCI, these models aim to understand better how variations in language diversity, measured differently, affect enrollment rates at various educational levels. This approach allows us to compare the effects of different language diversity measures while keeping other socio-economic and demographic factors constant.

2.3.4 Results and Discussion

Table 2-3 and

Table 2-4 presents the empirical estimation results of the abovementioned six models. The results in Table 2-3 correspond to the first three models, which utilize the HLCI, while Table 2-4 provides the results for the next three models, which use the LDI. Both tables depict the outcomes of the Poisson regression analyses conducted for these models. In each table, the first column lists the variables examined in the study.

In Table 2-3, columns 2 and 3 display the Poisson regression results for the first model, capturing the relationship between the independent variables and primary education enrollment. Columns 4 and 5 show the Poisson regression results for the second model, focusing on secondary education enrollment. Columns 6 and 7 present the results for the third model, which examines higher education enrollment. Bs denote the parameters estimated through Poisson regression, and the incident rate ratios are presented by coefficients labelled as “irr.” Specifically, the Poisson distribution postulates that the count-dependent variable exhibits equality between its mean and variance. Poisson (1837) defined Poisson distribution with a unique and restrictive property, stating that a dependent variable's mean and variance

must be identical. Nonetheless, the estimations in the initial model on distinct dependent variables contemplated that the Poisson distribution exhibits overdispersion, which occurs when the variance exceeds the mean model (Dean & Lawless, 1989).

Table 2-3: Poisson Regression Estimates of Language Diversity (HLCI) and Education Enrollment

Variables	Primary Education Enrollment		Secondary Education Enrollment		High Education Enrollment	
	βs	irr	βs	irr	βs	irr
HLCI	-0.452**	0.636**	-0.223	0.800	0.303**	1.354**
	(0.207)	(0.132)	(0.159)	(0.128)	(0.122)	(0.165)
LEEX	0.306***	1.358***	0.403***	1.496***	0.627***	1.871***
	(0.0640)	(0.0869)	(0.0454)	(0.0679)	(0.0566)	(0.106)
LNEY	0.312***	1.366***	0.357***	1.429***	0.467***	1.595***
	(0.102)	(0.140)	(0.0761)	(0.109)	(0.0557)	(0.0888)
HDI	-0.728**	0.483**	1.067***	2.905***	0.0517	1.053
	(0.371)	(0.179)	(0.240)	(0.697)	(0.314)	(0.330)
AHS	-0.126**	0.882**	0.0530	1.054	-0.00630	0.994
	(0.0549)	(0.0484)	(0.0365)	(0.0385)	(0.0440)	(0.0437)
PGR	0.0528	1.054	-0.0346	0.966	0.0164	1.017
	(0.0673)	(0.0710)	(0.0580)	(0.0560)	(0.0440)	(0.0448)
PP	0.568***	1.764***	0.183**	1.200**	-0.322***	0.724***
	(0.123)	(0.217)	(0.0779)	(0.0935)	(0.0849)	(0.0615)
PS	0.128	1.136	0.202*	1.223*	0.157	1.171
	(0.178)	(0.202)	(0.108)	(0.132)	(0.125)	(0.146)
PB	-0.163	0.849	0.178*	1.195*	0.119	1.126
	(0.171)	(0.145)	(0.107)	(0.128)	(0.121)	(0.137)
Constant	-2.075	0.126	-5.498***	0.00410***	-11.05***	1.58e-05***
	(1.283)	(0.161)	(0.951)	(0.00389)	(0.603)	(9.55e-06)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Table 2-4: Poisson Regression Estimates of Language Diversity (LDI) and Education Enrollment

Variables	Primary Education Enrollment		Secondary Education Enrollment		Higher Education Enrollment	
	βs	irr	βs	irr	βs	irr
LDI	0.453**	1.572**	0.222	1.249	-0.302**	0.739**
	(0.207)	(0.326)	(0.159)	(0.199)	(0.121)	(0.0896)
LEEX	0.306***	1.358***	0.403***	1.496***	0.627***	1.871***
	(0.0639)	(0.0868)	(0.0454)	(0.0679)	(0.0566)	(0.106)
LNEY	0.312***	1.366***	0.357***	1.429***	0.467***	1.595***
	(0.102)	(0.140)	(0.0761)	(0.109)	(0.0557)	(0.0889)
HDI	-0.727**	0.483**	1.067***	2.906***	0.0514	1.053
	(0.371)	(0.179)	(0.240)	(0.697)	(0.314)	(0.330)
AHS	-0.126**	0.882**	0.0531	1.055	-0.00652	0.993
	(0.0549)	(0.0485)	(0.0365)	(0.0385)	(0.0440)	(0.0437)
PGR	0.0526	1.054	-0.0348	0.966	0.0166	1.017
	(0.0673)	(0.0709)	(0.0580)	(0.0560)	(0.0441)	(0.0448)
PP	0.568***	1.764***	0.183**	1.200**	-0.322***	0.724***
	(0.123)	(0.217)	(0.0779)	(0.0935)	(0.0849)	(0.0615)
PS	0.128	1.137	0.202*	1.224*	0.157	1.170
	(0.178)	(0.202)	(0.108)	(0.132)	(0.125)	(0.146)
PB	-0.163	0.850	0.179*	1.196*	0.119	1.126
	(0.171)	(0.145)	(0.107)	(0.128)	(0.121)	(0.137)
Constant	-2.531*	0.0796*	-5.721***	0.00328***	-10.75***	2.15e-05***
	(1.374)	(0.109)	(1.042)	(0.00341)	(0.664)	(1.43e-05)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

All estimated Poisson regression models presented in Tables 2-3 and 2-4, which estimate the effects of language diversity (HLCI and LDI) on education enrollment at different levels, were tested for overdispersion to ensure their suitability for the data. Overdispersion, which occurs when the variance exceeds the mean of the dependent variable, can result in underestimated standard errors and inflated test statistics, potentially leading to misleading

conclusions. In this study, the dispersion statistic was estimated by dividing the Pearson chi-square statistic by its degrees of freedom, which resulted significantly greater than one, confirming the presence of overdispersion. In educational enrolment design studies, the overdispersion could come from several possible sources, e.g., omitted variables, uncertainty in exposure data and covariates, and a nonhomogeneous study environment (Miaou, 1994). Similarly, knowledge of recent developments in this statistical methodology considerably relaxes the constraints of the conventional Poisson and negative binomial, which is not widespread.

This finding suggests that the data variability is not fully captured by the Poisson model, indicating that a negative binomial model, which accounts for overdispersion, may be more appropriate for accurately estimating the effects of language diversity on education enrollment. The present model constitutes a generalized version of the Poisson regression model, including an additional term that rectifies the issue of overdispersion. Incorporating the dispersion parameter enables a more precise variance estimation, resulting in a statistically sound analysis. According to McCullagh and Nelder (1989), overdispersion can be attributed to intrasubject variability, wherein the count of incidents for a particular individual follows a Poisson distribution. However, it is noted that the joint distribution within the population no longer conforms to the Poisson distribution; however, the negative binomial model is utilized to tackle the issue of unaccounted intrasubject variations that arise from unobserved factors. The alpha is the dispersion parameter reported in the two models. If the dispersion parameter equals zero, the model reduces to the simpler Poisson model. If the dispersion parameter, alpha, is significantly greater than zero, the data are over-dispersed and are better estimated using a negative binomial model than a Poisson model, illustrating the overdispersion (Hoffman, 2003; Lawless, 1987; Wang et al., 2020).

The results presented in Tables 2-5 and 2-6 demonstrate the presence of overdispersion in the Poisson regression models, as evidenced by the significant values of `LNALPHA` (the natural logarithm of the overdispersion parameter). In theory, a Poisson model assumes that the mean and variance of the dependent variable are equal; however, in practice, this assumption often does not hold, particularly in datasets where variability exceeds what the model predicts. Both tables' significant and positive `LNALPHA` values confirm that the

variance is greater than the mean, indicating substantial overdispersion. This finding aligns with theoretical criteria that suggest moving to a more flexible model, like the Negative Binomial regression, when overdispersion is detected. The Negative Binomial model allows an additional parameter to account for this extra variability, providing more accurate standard errors and test statistics. Therefore, the statistically significant `LNALPHA` values validate the choice of the Negative Binomial regression over the Poisson regression, ensuring the robustness and reliability of the study's results.

Table 2-5: Negative Binomial Regression Estimates of Language Diversity (HLCI) and Education Enrollment

	Primary Education Enrollment		Secondary Education Enrollment		Higher Education Enrollment	
Variables	βs	irr	βs	irr	βs	irr
HLCI	-0.435**	0.648**	-0.0922	0.912	0.184	1.202
	(0.183)	(0.119)	(0.123)	(0.112)	(0.142)	(0.171)
LEEX	0.343***	1.409***	0.360***	1.433***	0.612***	1.844***
	(0.0804)	(0.113)	(0.0520)	(0.0745)	(0.0624)	(0.115)
LNEY	0.250**	1.284**	0.405***	1.500***	0.392***	1.479***
	(0.127)	(0.163)	(0.0714)	(0.107)	(0.0702)	(0.104)
HDI	-0.291	0.748	0.974***	2.649***	0.401	1.493
	(0.385)	(0.288)	(0.225)	(0.596)	(0.299)	(0.447)
AHS	-0.172***	0.842***	0.0188	1.019	0.0282	1.029
	(0.0545)	(0.0459)	(0.0418)	(0.0426)	(0.0456)	(0.0469)
PGR	0.109**	1.115**	0.0176	1.018	-0.0139	0.986
	(0.0525)	(0.0586)	(0.0375)	(0.0381)	(0.0515)	(0.0508)
PP	0.550***	1.734***	0.150	1.162	-0.252***	0.777***
	(0.121)	(0.209)	(0.0953)	(0.111)	(0.0869)	(0.0675)
PS	0.132	1.141	0.0897	1.094	0.413***	1.511***
	(0.172)	(0.197)	(0.134)	(0.146)	(0.140)	(0.212)
PB	-0.0391	0.962	0.0865	1.090	0.292**	1.339**
	(0.191)	(0.184)	(0.107)	(0.117)	(0.119)	(0.160)
LNALPHA	**-1.712*** **	**0.180*** **	**-2.657*** **	**0.0702*** **	**-2.371*** **	**0.0934*** **
	(0.190)	**(0.0343)**	**(0.194)**	**(0.0136)**	**(0.199)**	**(0.0186)**
CONSTANT	-1.732	0.177	-5.474***	0.00419***	-10.08***	4.18e-05***
	(1.291)	(0.228)	(0.833)	(0.00349)	(0.850)	(3.55e-05)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Table 2-6: Negative Binomial Regression Estimates of Language Diversity (LDI) and Education Enrollment

	Primary Education Enrollment		**Secondary Education Enrollment**		**Higher Education Enrollment**	
Variable	βs	irr	βs	irr	βs	irr
LDI	0.435**	1.545**	0.0919	1.096	-0.184	0.832
	(0.183)	(0.282)	(0.123)	(0.134)	(0.142)	(0.118)
LEEX	0.343***	1.409***	0.360***	1.433***	0.612***	1.844***
	(0.0804)	(0.113)	(0.0520)	(0.0745)	(0.0624)	(0.115)
LNEY	0.250**	1.284**	0.405***	1.500***	0.392***	1.479***
	(0.127)	(0.163)	(0.0714)	(0.107)	(0.0702)	(0.104)
HDI	-0.290	0.748	0.974***	2.649***	0.401	1.493
	(0.385)	(0.288)	(0.225)	(0.596)	(0.299)	(0.447)
AHS	-0.172***	0.842***	0.0188	1.019	0.0282	1.029
	(0.0545)	(0.0459)	(0.0418)	(0.0426)	(0.0456)	(0.0469)
PGR	0.109**	1.115**	0.0176	1.018	-0.0138	0.986
	(0.0525)	(0.0586)	(0.0375)	(0.0381)	(0.0515)	(0.0508)
PP	0.550***	1.734***	0.150	1.162	-0.252***	0.777***
	(0.121)	(0.209)	(0.0953)	(0.111)	(0.0869)	(0.0675)
PS	0.132	1.141	0.0898	1.094	0.413***	1.511***
	(0.172)	(0.197)	(0.134)	(0.146)	(0.140)	(0.212)
PB	-0.0388	0.962	0.0865	1.090	0.292**	1.339**
	(0.191)	(0.184)	(0.107)	(0.117)	(0.119)	(0.160)
LNALPHA	**-1.712*** **	**0.180*** **	**-2.657*** **	**0.0702*** **	**-2.371*** **	**0.0934*** **
	(0.190)	**(0.0343)**	**(0.194)**	**(0.0136)**	**(0.199)**	**(0.0186)**
Constant	-2.170*	0.114*	-5.566***	0.00382***	-9.899***	5.02e-05***
	(1.316)	(0.150)	(0.883)	(0.00338)	(0.925)	(4.64e-05)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

The present study employed a negative binomial in the final model to assess linguistic diversity's influence on school enrollment. In the model, income is an endogenous variable due to its correlation with the error terms such as education, skills, and assets. Given the study's restricted scope, the potential presence of omitted variables represents an alternative explanation for endogeneity. Unobserved factors, such as socio-economic status and parents' level of education, can impact income and participation in educational programs. Income endogeneity occurs when income becomes correlated with unobserved variables. The

differences in earnings have the potential to result in endogeneity. In cases where income is inaccurately measured, it is possible for the error term associated with the measurement to exhibit a correlation with the error term present in the regression model, leading to the issue of endogeneity. Endogeneity within the income variable suggests that the association between income and enrollment in education cannot be exclusively attributed to a direct causal relationship. Rather than being solely determined by a single factor, the estimation of coefficients can be influenced by various other factors, potentially resulting in biased or inconsistent estimates (Chesher, 2010; Heckman & Navarro-Lozano, 2004).

Allison and Waterman (2002) elaborated that instruments correlate with income, considered the endogenous variable, although not directly influenced by the error term. The instruments above are expected to meet the relevance criterion about income and substantially influence enrollment in education. In the initial phase, a regression model is computed to estimate the anticipated values of the endogenous variable (income) utilizing the instruments. The regression model aims to capture the association between the instruments and income. The Control Function is then executed, incorporating the anticipated income values from the initial phase into the negative binomial regression model as a control variable. The control above function is exogenous and mitigates the issue of endogeneity (Yasmin et al., 2022). In the second stage, the negative binomial regression is estimated by incorporating the control function and other variables. The coefficients of interest, which encompass the influence of income on education enrollment, may be construed as the causal effect while accounting for endogeneity. The analysis is based on income endogeneity, the control function approach, and negative binomial regression. The method yields coefficient estimates that are both consistent and unbiased, thereby enabling a more precise examination of the correlation between income and education enrollment while mitigating any potential endogeneity-related bias (Gu et al., 2019).

Table 2-7: Control Function With Negative Binomial Regression - Estimates of Language Diversity (HLCI) and Education Enrollment

Variables	Primary Education Enrollment	Secondary Education Enrollment	Higher Education Enrollment
HLCI	-0.561***	-0.225*	-0.0419
	(0.183)	(0.119)	(0.145)
LNEY	0.610***	0.782***	1.033***
	(0.0840)	(0.0553)	(0.0593)
HDI	0.282	1.575***	1.422***
	(0.397)	(0.210)	(0.251)
AHS	-0.141***	0.0515	0.0838*
	(0.0520)	(0.0416)	(0.0438)
PGR	0.0954*	0.00348	-0.0379
	(0.0526)	(0.0377)	(0.0514)
PP	0.412***	0.00517	-0.498***
	(0.117)	(0.0964)	(0.0913)
PS	-0.171	-0.228*	-0.127
	(0.159)	(0.128)	(0.143)
PB	-0.376**	-0.267**	-0.309**
	(0.178)	(0.115)	(0.132)
LNALPHA	-1.712***	-2.657***	-2.371***
	(0.190)	(0.194)	(0.199)
V4HAT	0.343***		
	(0.0804)		
V5HAT		0.360***	
		(0.0520)	
V6HAT			0.612***
			(0.0624)
Constant	-2.839**	-6.633***	-12.06***
	(1.220)	(0.841)	(0.873)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Table 2-8: Control Function With Negative Binomial Regression - Estimates of Language Diversity (LDI) and Education Enrollment

Variables	Primary Education Enrollment	Secondary Education Enrollment	Higher Education Enrollment
LDI	0.562***	0.225*	0.0421
	(0.182)	(0.118)	(0.144)
LNEY	0.610***	0.782***	1.033***
	(0.0840)	(0.0553)	(0.0593)
HDI	0.283	1.575***	1.422***
	(0.397)	(0.210)	(0.251)
AHS	-0.141***	0.0516	0.0839*
	(0.0520)	(0.0416)	(0.0438)
PGR	0.0953*	0.00342	-0.0379
	(0.0526)	(0.0377)	(0.0514)
PP	0.412***	0.00510	-0.498***
	(0.117)	(0.0964)	(0.0914)
PS	-0.171	-0.228*	-0.127
	(0.159)	(0.128)	(0.144)
PB	-0.376**	-0.267**	-0.309**
	(0.178)	(0.115)	(0.132)
LNALPHA	-1.712***	-2.657***	-2.371***
	(0.190)	(0.194)	(0.199)
V10HAT	0.343***		
	(0.0804)		
V11HAT		0.360***	
		(0.0520)	
V12HAT			0.612***
			(0.0624)
Constant	-3.404***	-6.859***	-12.10***
	(1.237)	(0.886)	(0.953)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

2.3.4.1 **Results**

Table 2-7 and Table 2-8 illustrate the estimates of three models, Models 1 through 3, which individually examine the impact of language diversity on education enrollment across

different levels—primary, secondary, and higher education. Table 2-7 and Table 2- 8 employs the LDI as core independent variables. The residuals from the first-stage regressions (i.e., the residuals for total, primary, secondary, and higher education enrollment) used in Models 1 to 3 show statistically significant coefficients, indicating the presence of endogeneity issues. As a result, the econometric estimates of the negative binomial regressions using the control function (CF) approach are applied, and the results are presented in Table 2-7, the estimates for the negative binomial regression with a control function approach are provided for 6 models.

In Model 1, Table 2-7, the coefficient for language diversity (β1) is 0.562, which is highly significant and indicates a negative association between language concentration and primary education enrollment. This finding suggests that enforcing a common language in early education can reduce enrollment rates, as demonstrated by data from various districts in Pakistan where education is not provided in the children's mother tongue. The study highlights that Pakistan has a significant number of children affected by this policy, with severe implications if not addressed. The LNEY coefficient is 0.610, which indicates a high level of statistical significance and suggests a positive relationship between the variable LNEY and primary education enrollment. In addition, the HDI coefficient is 0.283, which is not statistically significant, indicating that HDI has a negligible effect on the EEP in the model. Consequently, the AHS coefficient is -0.141, which indicates a high significance level and suggests that a one-unit increase in the variable AHS is anticipated to result in a 0.141-unit decrease in the dependent variable. The PGR coefficient is also statistically significant at 0.0953. PGR is anticipated to have a positive influence on EEP. In addition, the model includes dummy variables, demonstrating that PP is highly significant and indicating statistical significance, which means that if a district is in Punjab, it substantially affects EEP. The PS dummy variable is insignificant, indicating that a district's affiliation with the Province of Sindh has no significant effect on the dependent variable. If a district belongs to Baluchistan, its EEP is significantly impacted, as indicated by the statistical significance of the PB dummy variable. All the values of the dummy variable are presented relative to the province KP, which is considered the model's base category.

In Model 2, where (β1) in Model 2 is 0.225, which is highly significant and illustrates a negative association between HLCI and education enrollment at the secondary level of education. However, the significance of language diversity is lower than its importance in primary education. The LNEY coefficient is 0.782, indicating a high statistical significance level and a positive relationship between the variable LNEY and secondary education enrollment. In addition, the HDI coefficient is 1.575, which is highly statistically significant, indicating that HDI substantially affects the EES in the model. Consequently, the AHS coefficient is 0.0515, which is insignificant and has a negligible impact on EES. The PGR coefficient is also statistically significant at 0.00348. PGR is anticipated to have a positive but insignificant influence on EES. In addition, the model includes dummy variables, demonstrating that PP is insignificant, which means that if a district is in Punjab, it has no substantial effect on EES. The PS dummy variable is significant, indicating that a district's affiliation with the Province of Sindh substantially affects the dependent variable, EES. If a district belongs to Baluchistan, its EES is significantly impacted, as indicated by the statistical significance of the PB dummy variable. All the values of the dummy variable are presented relative to the province KP, which is considered the model's base category.

In Model 3, the coefficient for language diversity HLCI (β1) is 0.0419, which is highly insignificant and demonstrates a negative association between language concentration and higher education enrollment. However, the insignificance of language concentration is recognized at the university level rather than at the elementary and secondary levels. The LNEY coefficient is 1.033, indicating a statistically significant relationship between the variable LNEY and higher education enrollment. In addition, the HDI coefficient is 1.422, which is statistically highly significant, indicating that HDI substantially impacts the EEH in the model. Consequently, the AHS coefficient is 0.838, indicating that AHS substantially impacts EEH. At -0.00342, the PGR coefficient is expected to have a negative but insignificant effect on EEH. In addition, the model contains dummy variables, demonstrating that PP is significant, meaning that a district's location in Punjab has no significant effect on EEH. The significance of the PS dummy variable indicates that a district's affiliation with Sindh Province has no substantial effect on the dependent variable, EEH. The statistical significance of the PB dummy variable indicates that if a district is in Baluchistan, its EEH is significantly impacted.

All dummy variable values are presented relative to the province KP, the model's base category.

The results for Models 4, 5, and 6 in **Table 2-8** provide insights into the impact of language diversity, as measured by the LDI, on educational enrollment across different levels—primary, secondary, and higher education—using a control function approach with Negative Binomial regression. These models build on the previous analysis by incorporating the LDI, which provides a broader understanding of language diversity's effects on education outcomes.

In Model 4, the coefficient for LDI is 0.562 and statistically significant, indicating a positive association between LDI and primary education enrollment, which suggests that primary education enrollment rates tend to be higher in regions with higher language diversity. This finding contrasts with the typical expectation that linguistic diversity might create educational barriers due to potential language mismatches between home and school. Instead, it implies that diverse linguistic environments may encourage more inclusive educational practices or policies that accommodate multiple languages, thereby boosting enrollment. For secondary education enrollment in Model 5, the LDI coefficient is 0.225 and statistically significant, although its effect size is smaller than primary education. This result suggests that while language diversity continues to influence enrollment at the secondary level positively, the impact is less pronounced than at the primary level, which might indicate that as students' progress in their education, other factors—such as academic readiness and socioeconomic conditions—begin to play a more substantial role, reducing the direct impact of language diversity on enrollment. In Model 6, which focuses on higher education enrollment, the coefficient for LDI is 0.0419 and not statistically significant, indicating that language diversity does not have a meaningful impact on enrollment at this level. This lack of significance suggests that language barriers are largely overcome when students reach higher education or language diversity is no longer a critical factor influencing whether students pursue further education. At this stage, other determinants, such as economic capacity, educational preparation, and personal aspirations, are likely to be more influential.

Compared to the HLCI models in Table 2-7, the LDI models in Table 2-8 show some distinct differences. While both LDI and HLCI measure aspects of linguistic environments,

the LDI results in Table 2-8 consistently show a positive association with educational enrollment, particularly at the primary and secondary levels. In contrast, the HLCI models in Table 2-7 generally show a negative association with enrollment at the primary level, as indicated by the significant negative coefficient (-0.561) for HLCI, which suggests that regions with a dominant single language (high HLCI) might have lower enrollment rates, possibly due to less inclusive language policies or fewer multilingual educational resources. The differing impacts of LDI and HLCI suggest that while linguistic concentration (as measured by HLCI) might restrict access to education at lower levels due to a lack of language inclusivity, language diversity (as captured by LDI) could foster more inclusive environments that encourage enrollment. This difference highlights the importance of promoting multilingual education policies, particularly in linguistically diverse regions, to enhance educational access and participation across different education levels.

2.3.4.2 Discussion

This study demonstrated a synthesis of data and analysis from 124 districts of Pakistan that outlines the effects of language diversity, i.e., where education is not provided in the children's mother language. The analysis revealed that Pakistan has the most significant number of affected children and that the consequences of inaction are likely to be the most severe. There is a missing link behind students' below-average academic performance, low enrolments, and high school dropout rate among children, despite implementing measures to enhance the standard of education, which is the instruction not in the mother language. It is established that using the mother language in educational institutions to impart the curriculum is a crucial determinant of academic achievement among children. Recently, substantial evidence has surfaced about the role of language in education (Lone & Efstratopoulou, 2022; Marongedza et al., 2023).

Annually, 10 percent of European students finish their education without earning a degree. According to Van Den Berghe et al. (2024), the "early leavers from training and education" cohort consists of individuals aged 18 to 24 who have not completed upper secondary education and are not enrolled in further education. These early leavers see educational language as an essential and predictable factor. On the one hand, it is not uncommon for the conventional educational language to differ from the student's mother

language. As a result, the content of lessons and courses is frequently unclear, making it difficult to achieve academic excellence. Speaking a language other than one's mother tongue has significant disadvantages compared to those who speak their mother language. In contrast, due to the intensive nature of language lessons, acquiring a foreign language result in a delay before students begin formal education. The delay may cause a decrease in motivation to pursue further education (De Coninck et al., 2023).

There is extensive documentation on the relationship between high school dropout and various individual and societal consequences. Children who do not speak English as their primary language are significantly more likely to drop out of school before completing their education (Levin, 1972; Lloyd et al., 2000; Reyes & Jason, 1993). Dropout rates among American Indian youth, many of whom are poor and do not speak English, are significantly higher as a result of their exposure to a foreign language during their early education (Lloyd et al., 2000). The estimated dropout rate among American Indians, as reported by the Washington State Advisory Committee on Civil Rights in 1974, ranges between 38 percent and 60 percent. According to Steinberg et al. (1984), the dropout rates among American Indians in Nome, Alaska, Minneapolis, and certain parts of California are estimated to be 90 percent, 62 percent, and 70 percent, respectively. The dropout rate among Hispanic youths aged 16 and 17, who come from families with incomes below $10,000, is slightly higher than that of white non-Hispanics. Rumberger (1983) conducted a study with data from the National Longitudinal Survey of Youth Labor Market Experience, focusing on people aged 14 to 21. This study found that Hispanics in poor households have a 1.5 times higher dropout rate than similarly disadvantaged whites.

Additionally, individuals without proficiency in a second language have a four-fold higher dropout rate than those who do. The importance of a person's proficiency in a second or foreign language as a predictor of dropping out outweighs the influence of their non-native background. Individuals who do not speak English and come from a non-English-speaking background have a dropout rate of 40 percent, compared to 12 percent for non-native speakers of second/foreign languages. Individuals of Hispanic descent have a 1.5 times higher dropout rate than individuals of non-English language backgrounds who speak English. Individuals of Hispanic descent have a 1.5 times higher dropout rate than people of non-Hispanic descent

when their primary language is not English and they come from non-English language backgrounds (Steinberg et al., 1984). Language barriers have a significant impact on people's well-being. Linguistic barriers can make public communication impossible and exclude people from fair participation in education and social life (Bodis, 2021). As estimated by UNESCO, the prevalence of linguistic exclusion is significant, with approximately 40 percent of students worldwide experiencing a disparity between their mother language and the language used for educational purposes (Crawford & Marin, 2021; Unicef, 2021). Even in OECD countries, over 30 percent of adults lack the literacy skills to navigate complex bureaucratic procedures.

Language barriers include language selection, medium, and platform (Matta, 2020). Language choice barriers exist when institutions prefer a specific language when communicating with multilingual populations. These barriers primarily affect people with a different mother language (Piller & Bodis, 2024). The language barrier between the institution and its stakeholders can be highly significant. Furthermore, fluent individuals in the institution's language may face language barriers due to the institution's emphasis on written communication. The relationship between written communication and the audience's educational background is frequently incongruent (Birdsong, 2006; Piller et al., 2024). Furthermore, there is a growing convergence of these two types of language barriers, which can be exacerbated by unequal access to an institution's communication platform. However, in the current situation, all three barriers contribute to social exclusion. To effectively reach everyone in the community, it is critical to provide information in crucial stakeholders' languages and tailor the communication medium and platform to their abilities. There is no universal solution that works in all situations (Piller et al., 2023).

Empirical evidence indicates that using a child's first language, commonly known as the mother language, significantly influences their school attendance, particularly in rural regions. Using an unfamiliar language in teaching school curricula negatively impacts the enrollment rates of students not exposed to those languages in their home environment, particularly those who lack consistent access to it beyond the school setting—according to international assessments of learning outcomes, using a language other than a student's mother language, especially for primary educational instruction can be excessively challenging for them, especially when they encounter additional obstacles to learning, such as poor

circumstances, hunger, and inadequate learning environments (Espinosa, 2005). Pedagogically, children acquire knowledge by connecting novel information to their pre-existing cognitive schema. Immediate transitions into an unfamiliar language disjoint those relationships—lack of access to primary education in the mother language results in the exclusion of individuals from education. Empirical evidence suggests that excluding linguistic communities from education due to their lack of comprehension of the language utilized for instruction contributes to political instability and conflict (Benson, 2005).

The predominant focus of language-teaching literature has been on the instruction of English. However, a significant portion of this literature operates under the assumption that foreign language acquisition research, which posits that acquiring a new language is a universally consistent process, implicitly asserts its applicability to teaching any language. From this study's perspective, the lack of differentiation is a significant drawback. Although the psycholinguistic aspects of language learning may share specific common characteristics, the sociolinguistic factors differ significantly. As the English language expands and locates its status as the prevailing global language, it gives rise to distinct concerns regarding power dynamics and identity. While these issues are somewhat common among other dominant and widely spoken languages, they differ significantly from those encountered in the instruction of smaller and more geographically limited languages (Phillipson, 1992; Selvi et al., 2023); the rapid and extensive dissemination of English poses a potential danger to other languages (Seargeant, 2012).

Littlewood and Yu (2011) highlight the significance of the learners' mother language in the educational setting and the potential negative consequences of foreign language (English) instruction. Allwright and Bailey (1991) observe that excluding the learners' first language deprives them of their usual mode of communication, thereby hindering their ability to engage in typical social interactions fully. Chen (2003), learners attribute their reserve in the classroom to the challenges posed by communicative language teaching. Similarly, Brooks-Lewis (2009) examines the stress encountered by adult learners in a monolingual language classroom and their perception of bias towards their teacher. Similarly, the perspective on the matter is more explicitly political, highlighting the potential reinforcement of teacher power and authority through monolingual instruction. Consequently, using one's

language can be seen as a means to alleviate anxiety and improve the emotional atmosphere conducive to learning (Auerbach, 1993; Cummins, 2021).

Stibbard (1998) emphasizes the emotional and humanistic advantages of using the mother language with novice learners in Hong Kong. Levine (2003) proposes that using one's mother language in a moral and meaningful manner can help decrease learner anxiety. According to Canagarajah (1999), using one's mother language helps Sri Lankan learners feel comfortable and creates a less intimidating environment, mainly when talking about local events. Similarly, Edstrom (2006) found that using the learners' mother language helps to establish a connection with students and address cultural stereotypes in a light-hearted manner, which one believed could not be adequately addressed in a foreign language. It is observed that Finnish learners in a monolingual content-based class used their language for affective and interpersonal functions, which positively impacted in-class relationships (Nikula, 2007).

(Fang et al., 2023) posits that using one's mother language plays a significant role in fostering learner motivation and cultivating positive attitudes towards the language being acquired. Johnston's (2003) research, Edstrom proposes that teachers have a moral duty to acknowledge learners as unique individuals, demonstrate respect and care, and establish a positive emotional atmosphere that enhances learning. Prioritizing learner well-being takes precedence over maximizing the use of new language (Edstrom, 2006).

Instructing children in a language with which they are not proficient does not effectively equip them with the necessary cognitive skills, despite the intention to do so. The inability to attain basic concepts at the primary level of education when instructions are in a foreign language can impede individual development, which could be effectively tackled by providing a minimum of six years of education in the mother language and gradually integrating additional languages from an early developmental phase (Kyeyune, 2003). This methodology is increasingly being implemented across various contexts, generating outstanding achievements. Nonetheless, the global agreement regarding the efficacy of bilingual or multilingual education rooted in the mother language is insufficient to effect the necessary changes to address the inadequacies of language instruction in schools (Sierens & Van Avermaet, 2014).

Societies that exhibit the highest levels of linguistic diversity globally are most severely impacted, despite adopting a single national or international language for educational purposes, and are responsible for a considerable portion of children not enrolled in school (Núñez et al., 2016). There are 54 million children who are not enrolled in school and reside in countries with a high degree of linguistic diversity, accounting for 58 percent of children of primary school age. It comprises 72 percent of children not enrolled in school because the language of instruction is not the mother language (Pinnock & Vijayakumar, 2009). The fact indicates that prioritizing the language of instruction is imperative for successfully implementing strategies to achieve SDGs and EFA education objectives. In nations with significant linguistic diversity, particularly those with substantial rural populations, prioritizing the language of instruction in schools is crucial in enhancing educational accessibility and promoting positive academic achievements. The estimates depicted in

Table 2-7 and Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Table 2-8 denotes settings that pose a significantly elevated risk, where the language used for instruction may have adverse effects on educational accessibility and attainment and significant economic and political ramifications in the long run (Pinnock & Vijayakumar, 2009). Scholars have been engaged in discourse, contending that how language is employed in educational institutions is a crucial determinant of children's academic achievement. A pivotal inquiry relates to the connection between the language of instructions and the languages children encounter in their homes. According to estimations, a significant proportion of languages spoken by 44 percent of individuals are not employed as mediums of instruction in education globally (Shaeffer, 2019).

Recent findings suggest that the absence of the mother language instructions in school, which is the language in children's everyday experiences, can lead to complete exclusion from the learning process, which contemplates that teaching children in their primary language is necessary. The consensus among experts in education and linguistics instructing children in their mother language, which they have been using since birth, presents the most favorable opportunity for achieving academic achievement. Using children's mother language as a medium of instruction has been a topic of discussion for several years as a potential strategy to alleviate the educational obstacles encountered by indigenous minority children (Walter, 2009).

Although mother-language education is acknowledged as a beneficial practice, the power elite often operate under the presumption that children will manage adequately without mother-language schooling (Graham, 2010). An increasing amount of empirical data now challenges this assumption. Knowledge acquisition within an educational institution utilizing a language not commonly spoken within a child's domestic setting has been associated with substandard academic achievement and complete exclusion from the educational process observed in substantial cohorts across primary education in middle and low-income nations (Lone & Efstratopoulou, 2022; Shaeffer, 2019). The risks of ignoring this body of knowledge may be exceptionally high in societies where critical groups of children do not have access to instruction and learning in their mother language and where capacity constraints and poverty issues leave children with few learning supports. In fragile or conflict-affected nations, the

political and social implications of declining educational success along linguistic and racial lines are of particular concern to policymakers and the international community.

Nonetheless, increasing knowledge exists regarding implementing educational methods that facilitate children's learning and ensure the acquisition of proficient foreign language abilities at higher education levels while preserving and enhancing their mother language (Castro et al., 2011). The reason for this could be either the limited comprehension of available evidence by policymakers or the insufficient explanation of the adverse consequences of persisting with the instruction of languages that are not in the mother language. This research demonstrated that a synthesis of data and analysis from multiple districts of Pakistan outlines the effects of language diversity, i.e., where education is not provided in children's mother language. The analysis highlighted that Pakistan has the most significant number of children affected and where the effects of not acting are likely to be most severe.

In Pakistan, however, historical evidence indicates that various public policies view linguistic diversity as a hindrance rather than an asset, resulting in a significant decline of Indigenous languages in domains prioritizing literacy, such as education. According to Ethnologue (2022), the diversity of Pakistan's linguistic, ethnic, and cultural landscape, which includes 87 languages and dialects, is not adequately reflected in the country's official language policies. Most language policies, including those about education, have excluded mother languages from education (Ayres, 2003; Manan et al., 2017; Rahman, 1998). According to UNESCO's (2017) report on language vitality and extinction, 28 languages in Pakistan are in danger of extinction. Seven are categorized as vulnerable, fifteen as endangered, and six as critically endangered.

At the public level, there is a greater emphasis on academic literacy in Urdu (the national language) and English (the official language) than in mother languages; however, mother languages are frequently viewed as representations of culture and identity rather than as a means to introduce education (MananDavidDumanig, 2015). Moreover, Tsui and Tollefson (2004) contend that the origins and justifications for negative attitudes toward mother languages and lack of confidence among speakers in postcolonial nations such as Pakistan can be traced to colonial history and sociopolitical processes. The historical exclusion

of mother languages, their negative connotations, and the elevated status of former colonial languages have contributed to their lack of confidence as appropriate vehicles for education and as valid expressions of mother languages.

Given the prevalence of subtractive and reductionist policies, perceptions, and practices, in addition to the lack of attention to bi/multilingual education policies and practices by official and public entities, it is crucial to consider how to establish a sociolinguistic environment more conducive to bi/multilingual education and linguistic diversity (Mansoor, 2004; UNESCO, 2012). Primary education has predominantly sound impacts if conducted in the student's mother language to augment their proficiency in speaking, reading, and writing (Jashi, 2022). Implementing a bilingual instructional method at the elementary level can benefit children's acquisition of language (Effendi et al., 2022). Research highlights the advantages of bilingual programs in fostering advanced levels of foreign language accuracy compared to conventional language instruction (Steinlen & Piske, 2022). Furthermore, scholarly investigations provide evidence in favor of the notion of a pivotal phase in the linguistic progression of children, thereby advocating for the early implementation of bilingual education to optimize language acquisition (Rong & Abdullah, 2022). Nevertheless, it has been proposed that the implementation of foreign language instruction may be postponed until a later phase, such as the intermediate level of education, after students acquire cognitive capacities and proficient comprehension of fundamental concepts, which aims to maximize language acquisition results while guaranteeing a solid grounding in the mother language (Hossain, 2024). The current study demonstrated the potential impact of mother language education on literacy, identity formation in various contexts, and cognitive abilities beginning with primary school. According to Hornberger (2003), multilingual language policies aim to accommodate as many languages as possible, especially those marginalized or endangered. The goal is to enable these languages to thrive and grow rather than collapse and vanish.

2.4 Conclusion and Policy Recommendation

Education for all – but in whose language? It is unimplementable without consideration of primary learners' linguistic environment, which might entail a balance between educational efficiency, learner preferences, and recognition of linguistic diversity. The educational planning of Pakistan receives little support and recognition as a linguistically diverse nation.

English has been acknowledged as the dominant language but neglecting the mother language diminishes other languages' status and prevents many speakers from achieving formal literacy in their mother language.

Analysis of language diversity and education enrollment at primary, secondary, and higher levels of education using negative binomial regression revealed a negative relationship between language diversity and enrollment in primary education. Early introduction to a foreign language that is not comprehendible to students in instruction has a negative effect on enrollment rates. The data analysis from multiple districts of Pakistan revealed that Pakistan has the most affected children with no access to mother language instructions, hence likely to have critical consequences. The research emphasizes the need for effective language diversity policies to address the problem and promote a more inclusive educational system.

Pakistan's complex linguistic landscape necessitates implementing a sophisticated approach, which starts from mother language instruction so that children learn fundamental concepts more effectively in their mother language/language the language they understand (Urdu-national language in case of Pakistan) because they face no obstacles in understanding concepts (Yasmin et al., 2023). Pakistan is presently confronted with the obstacle of a hierarchical education system that has been passed down from colonialism, hindering socio-economic progress. Moreover, advocating for 'universal literacy' in indigenous languages can bolster national identity and protect endangered languages (Gonzales, 2018). The acknowledgement of the global necessity for English language acquisition is notable. Nevertheless, prioritizing multilingual education centered around the mother language aligns with the socio-cultural setting of Pakistan and holds promise for yielding more comprehensive and effective educational outcomes.

This research produced significant suggestions to be included in the educational policy framework of Pakistan. Findings indicated that implementing measures to improve the quality of education and instruction in a language other than the mother language (or the language children understand) is the missing link behind students' low enrollment among children. Policy formulation might acknowledge that using the mother language/Urdu language in Pakistani primary education institutions by hiring bilingual (/multilingual) teaching staff can bring more positive changes essential for improving educational outcomes. Most language

policies exclude these languages from the curriculum. Therefore, incorporating the mother/Urdu language into education in Pakistan may increase academic literacy. In Pakistan, education policy based on the gradual transition from instruction in the mother/Urdu language (primary education) to instruction in a foreign language (secondary/higher education) is suggested to policy experts. Therefore, students at higher levels of education should be provided with additional language classes and qualified language instructors to facilitate acquiring a foreign language without impeding their academic progress. In addition to this policy recommendation, it might be periodically reviewed and assessed to ensure its continued relevance and efficacy in education in Pakistan.

The policy experts should collaborate with linguists, experts, and relevant stakeholders to develop a primary curriculum that includes mother language instruction. The curriculum should provide a solid foundation in the mother language while gradually introducing a foreign language at higher levels, as per the language requirements of higher education and the job market of Pakistan. The government of Pakistan should invest in creating high-quality language resources and instructional materials in Indigenous languages. In addition, the policy initiatives should support the production and dissemination of culturally relevant literature written in local languages.

2.5 Study Limitations and Future Research Endeavors

The scope of this study is limited to analyzing data at the district level in Pakistan based on the availability of existing data. Due to the lack of detailed data on educational enrollments and dropout rates for various ethnic and linguistic groups, the study cannot fully explore the role of language disparities in influencing dropout rates. Additionally, incorporating a question about Mother Language in the PSLM survey could allow for a more in-depth investigation of these issues at the individual level. This change would enhance the understanding of disparities among language groups in shaping educational outcomes, providing a clearer picture of how language affects educational access and success.

2.6 References

Abdel-Aty, M. A., & Radwan, A. E. (2000). Modeling traffic accident occurrence and involvement. *Accident Analysis & Prevention, 32*(5), 633-642.

Agirdag, O., Demanet, J., Van Houtte, M., & Van Avermaet, P. (2011). Ethnic school composition and peer victimization: A focus on the interethnic school climate. *International Journal of Intercultural Relations, 35*(4), 465-473.

Airey, J. (2009). Science, language, and literacy: Case studies of learning in Swedish university physics. Acta Universitatis Upsaliensis,

Alesina, A., Baqir, R., & Easterly, W. (1999). Public goods and ethnic divisions. *The quarterly journal of economics, 114*(4), 1243-1284.

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth, 8*(2), 155-194.

Alesina, A., & Ferrara, E. L. (2005). Ethnic diversity and economic performance. *Journal of Economic Literature, 43*(3), 762-800.

Alesina, A. F., & Reich, B. (2015). Nation building.

Allison, P. D., & Waterman, R. P. (2002). Fixed–effects negative binomial regression models. *Sociological methodology, 32*(1), 247-265.

Allwright, D., & Bailey, K. M. (1991). *Focus on the language classroom*: Cambridge University Press.

Amemiya, T. (1985). *Advanced econometrics*: Harvard university press.

Anand, S., & Sen, A. (2000). Human development and economic sustainability. *World Development, 28*(12), 2029-2049.

Auerbach, E. R. (1993). Reexamining English only in the ESL classroom. *Tesol Quarterly, 27*(1), 9-32.

Ayres, J. (2003). " In the middle": Language Attitudes and Identity among Bilingual Hispanic-American College Students. *Céfiro: Enlace hispano cultural y literario, 4*(1), 47-60.

Bamgbose, A. (1999). African language development and language planning. *Social dynamics, 25*(1), 13-30.

Barro, R. J., & Lee, J.-W. (1994). *Sources of economic growth.* Paper presented at the Carnegie-Rochester conference series on public policy.

Barro, R. J., & Lee, J. W. (2013). A new data set of educational attainment in the world, 1950–2010. *Journal of Development Economics, 104*, 184-198.

Bazai, Z. u. R., Manan, S. A., & Pillai, S. (2022). Language policy and planning in the teaching of native languages in Pakistan. *Current Issues in Language Planning*, 1-19.

Bellmore, A., Nishina, A., You, J.-i., & Ma, T.-L. (2012). School context protective factors against peer ethnic discrimination across the high school years. *American Journal of Community Psychology*, *49*(1-2), 98-111.

Benson, C. (2005). The importance of mother tongue-based schooling for educational quality. *commissioned study for EFA Global Monitoring Report*, *24*.

Benson, C. (2019). L1-based multilingual education in the Asia and Pacific region and beyond: Where are we, and where do we need to go? In *The Routledge international handbook of language education policy in Asia* (pp. 29-41): Routledge.

Berk, R., & MacDonald, J. M. (2008). Overdispersion and Poisson regression. *Journal of Quantitative Criminology, 24*, 269-284.

Bialystok, E. (2001). Bilingualism in development: Language, literacy, and cognition: Cambridge University Press.

Blundell, R., & Matzkin, R. L. (2014). Control functions in nonseparable simultaneous equations models. *Quantitative Economics, 5*(2), 271-295.

Blundell, R. W., & Powell, J. L. (2004). Endogeneity in semiparametric binary response models. *The Review of Economic Studies, 71*(3), 655-679.

Bortkiewicz, L. (1898). The law of small numbers. BG Teubner, Leipzig, Germany.(en. wikipedia. org/wiki/Poisson_distribution).

Bove, V., & Elia, L. (2017). Migration, Diversity, and Economic Growth. *World Development, 89*, 227-239. doi:10.1016/j.worlddev.2016.08.012

Bretton, H. (1976). Political science, language, and politics. *Language and politics*, 432-448.

Brooks-Lewis, K. A. (2009). Adult learners' perceptions of the incorporation of their L1 in foreign language teaching and learning. *Applied linguistics, 30*(2), 216-235.

Brock-Utne, B. (2001). Education for all - in whose language? *Oxford Review of Education, 27*(1), 115-134. doi:10.1080/03054980125577

Brock-Utne, B. (2010). Research and policy on the language of instruction issue in Africa. *International Journal of Educational Development, 30*(6), 636-645.

Canagarajah, A. S. (1999). *Resisting linguistic imperialism in English teaching*: Oxford University Press.

Castro, D. C., Páez, M. M., Dickinson, D. K., & Frede, E. (2011). Promoting language and literacy in young dual language learners: Research, practice, and policy. *Child development perspectives, 5*(1), 15-21.

Chall, J. S. (1989). Learning to Read: The Great Debate 20 Years Later--A Response to" Debunking the Great Phonics Myth.". *Phi Delta Kappan, 70*(7), 521-538.

Chandra, N. K., Roy, D., & Ghosh, T. (2013). A generalized Poisson distribution. *Communications in Statistics-Theory and Methods, 42*(15), 2786-2797.

Chang, A., McDonald, P., & Burton, P. (2010). Methodological choices in work-life balance research 1987 to 2006: A critical review. *The International Journal of Human Resource Management, 21*(13), 2381-2413.

Chen, T. (2003). Reticence in class and on-line: Two ESL students' experiences with communicative language teaching. *System, 31*(2), 259-281.

Chesher, A. (2010). Instrumental variable models for discrete outcomes. *Econometrica, 78*(2), 575-601.

Clegg, J., & Milligan, L. O. (2021). Multilingual learning and language-supportive teaching in Rwandan learning materials. In *Multilingual learning and language supportive pedagogies in Sub-Saharan Africa* (pp. 201-227): Routledge.

Collier, V. P. (1987). Age and rate of acquisition of second language for academic purposes. *Tesol Quarterly, 21*(4), 617-641.

Coombs, P. H. (1985). The world crisis in education the view from the eighties: Oxford University Press.

Cox, D., & Lewis, P. (1966). The statistical analysis of. *Series of Events*.

Cox, D. R. (1983). Some remarks on overdispersion. *Biometrika, 70*(1), 269-274.

Cummins, J. (2000). Academic language learning, transformative pedagogy, and information technology: Towards a critical balance. *Tesol Quarterly, 34*(3), 537-548.

Cummins, J. (2021). *Rethinking the education of multilingual learners: A critical analysis of theoretical concepts* (Vol. 19): Multilingual Matters.

Dale-Olsen, H., & Finseraas, H. (2020). Linguistic diversity and workplace productivity. *Labour Economics, 64*, 101813.

Dean, C., & Lawless, J. F. (1989). Tests for detecting overdispersion in Poisson regression models. *Journal of the American Statistical Association, 84*(406), 467-472.

Dekker, D., & Young, C. (2005). Bridging the gap: The development of appropriate educational strategies for minority language communities in the Philippines. *Current Issues in Language Planning, 6*(2), 182-199.

Desmet, K., Ortuño-Ortín, I., & Wacziarg, R. (2016). Linguistic cleavages and economic development. In *The Palgrave handbook of economics and language* (pp. 425-446): Springer.

Driessen, G. (2010). School and classroom diversity effects on cognitive and non-cognitive student outcomes.

Duncan, G. J., Brooks-Gunn, J., & Klebanov, P. K. (1994). Economic deprivation and early c

Easterly, W., Alesina, A. F., & Baqir, R. (1997). Public Goods and Ethnic Divisions. *Available at SSRN 46092*.

Easterly, W., & Levine, R. (1997). Africa's growth tragedy: policies and ethnic divisions. *The quarterly journal of economics*, 1203-1250.

hildhood development. *Child development, 65*(2), 296-318.

Effendi, A. M. s., Rini, S., & Kusumawati, E. R. (2022). Bilingual Learning in Global English Class Learning Communities for Elementary School Level Children. *Maharot: Journal of Islamic Education, 6*(2), 141-152.

Edstrom, A. (2006). L1 use in the L2 classroom: One teacher's self-evaluation. *Canadian Modern Language Review, 63*(2), 275-292.

Espinosa, L. M. (2005). Curriculum and assessment considerations for young children from culturally, linguistically, and economically diverse backgrounds. *Psychology in the Schools, 42*(8), 837-853.

Fang, F., Jiang, L., & Yang, J. (2023). To impart knowledge or to adhere to policy: Unpacking language ideologies and practices in Chinese EMI courses through a translanguaging lens. *Language Teaching Research*, 13621688231183771.

Fearon, J. D. (2003). Ethnic and cultural diversity by country. *Journal of Economic Growth*, 195-222.

Fiala, O., & Delamonica, E. (2022). Public Spending and Investment in Children: Measuring and Assessing Social and Economic Justice. In *Social Justice for Children in the South* (pp. 43-59): Springer.

Fishman, J. A., Ferguson, C. A., & Dasgupta, J. (1968). *Language problems of developing nations*: Wiley New York.

Foorman, B. R., & Nixon, S. M. (2006). The influence of public policy on reading research and practice. *Topics in language disorders, 26*(2), 157-171.

Friedman, M. (1953). *Essays in positive economics*: University of Chicago press.

Frome, E. L., Cragle, D. L., & McLain, R. W. (1990). Poisson regression analysis of the mortality among a cohort of World War II nuclear industry workers. *Radiation research, 123*(2), 138-152.

Fujii, T., Nakajima, M., & Xu, S. (2023). Teaching in the right context: Textbook supply program, language, and learning. *Review of Development Economics*.

Gardner, W., Mulvey, E. P., & Shaw, E. C. (1995). Regression analyses of counts and rates: Poisson, overdispersed Poisson, and negative binomial models. *Psychological bulletin, 118*(3), 392.

Gfeller, E., & Robinson, C. (1998). Which language for teaching? The cultural messages transmitted by the languages used in education. *Language and Education, 12*(1), 18-32.

Ginsburgh, V., & Weber, S. (2020). The economics of language. *Journal of Economic Literature, 58*(2), 348-404.

Gonzales, J. B. (2018). MOTHER TONGUE-BASED MULTILINGUAL EDUCATION IMPLEMENTATION IN CEBU PHILIPPINES, IN THE EYES OF THE STAKEHOLDERS. *International Journal of Research Science and Management, 5*(2), 165-172.

Graham, B. E. (2010). Mother tongue education: necessary? Possible? Sustainable? *Language and Education, 24*(4), 309-321.

Greenberg, J. H. (1956). The measurement of linguistic diversity. *Language, 32*(1), 109-115.

Greenwood, M., & Yule, G. U. (1920). An inquiry into the nature of frequency distributions representative of multiple happenings with particular reference to the occurrence of multiple attacks of disease or of repeated accidents. *Journal of the Royal statistical society, 83*(2), 255-279.

Grimshaw, G. M., Adelstein, A., Bryden, M. P., & MacKinnon, G. (1998). First-language acquisition in adolescence: Evidence for a critical period for verbal language development. *Brain and Language, 63*(2), 237-255.

Grin, F. (1999). Language Policy in Multilingual Switzerland-Overview and Recent Developments.

Gu, H., Liu, Z., Shen, T., & Meng, X. (2019). Modelling interprovincial migration in China from 1995 to 2015 based on an eigenvector spatial filtering negative binomial model. *Population, Space and Place, 25*(8), e2253.

Hamid, M. O., Jahan, I., & Islam, M. M. (2013). Medium of instruction policies and language practices, ideologies and institutional divides: Voices of teachers and students in a private university in Bangladesh. *Current Issues in Language Planning, 14*(1), 144-163.

Hanley, J. A., & Bhatnagar, S. (2022). The "Poisson" Distribution: History, Reenactments, Adaptations. *The American Statistician, 76*(4), 363-371.

Hannan, M. T., & Carroll, G. R. (1992). Dynamics of organizational populations: Density, legitimation, and competition: Oxford University Press.

Hanushek, E. A., & Woessmann, L. (2012). Do better schools lead to more growth? Cognitive skills, economic outcomes, and causation. *Journal of Economic Growth, 17*, 267-321.

Heckman, J., & Navarro-Lozano, S. (2004). Using matching, instrumental variables, and control functions to estimate economic choice models. *Review of Economics and statistics, 86*(1), 30-57.

Heckman, J. J., & Robb Jr, R. (1985). Alternative methods for evaluating the impact of interventions: An overview. *Journal of econometrics, 30*(1-2), 239-267.

Herbers, J. E., Cutuli, J., Supkoff, L. M., Heistad, D., Chan, C.-K., Hinz, E., & Masten, A. S. (2012). Early reading skills and academic achievement trajectories of students facing poverty, homelessness, and high residential mobility. *Educational Researcher, 41*(9), 366-374.

Hjort, J. (2014). Ethnic Divisions and Production in Firms

*. *The quarterly journal of economics, 129*(4), 1899-1946. doi:10.1093/qje/qju028

Hoffman, D. (2003). Negative binomial control limits for count data with extra-Poisson variation. *Pharmaceutical Statistics: The Journal of Applied Statistics in the Pharmaceutical Industry, 2*(2), 127-132.

Hornberger, N. H. (2003). Continua of biliteracy: An ecological framework for educational policy, research, and practice in multilingual settings (Vol. 41): Multilingual Matters.

Hornberger, N. H. (2008). *Can schools save indigenous languages?* : Palgrave Macmillan New York, NY.

Hossain, K. I. (2024). Reviewing the role of culture in English language learning: Challenges and opportunities for educators. *Social Sciences & Humanities Open, 9*, 100781.

Hou, D. (2022). The Impact of Education on Domestic Terrorism in Asia: A Control Function Approach. *Defence and Peace Economics, 33*(7), 857-875.

Hovens, M. (2002). Bilingual education in West Africa: Does it work? *International Journal of Bilingual Education and Bilingualism, 5*(5), 249-266.

Hudson, M. C., & Taylor, C. L. (1972). *World handbook of political and social indicators*: Yale University Press New Haven, Conn.

Humboldt, W. (1988). On language: The diversity of human language-structure and its influence on the mental development of mankind.

Jaekel, N., Schurig, M., Florian, M., & Ritter, M. (2017). From early starters to late finishers? A longitudinal study of early foreign language learning in school. *Language Learning, 67*(3), 631-664.

Johnson, D. C., & Pratt, K. L. (2014). Educational language policy and planning. *The encyclopedia of applied linguistics*, 1-7.

Johnson, N. L., Kemp, A. W., & Kotz, S. (2005). *Univariate discrete distributions* (Vol. 444): John Wiley & Sons.

Kosonen, K. (2005). Education in local languages: Policy and practice in South-East Asia. Asia-Pacific Programme of Education for All First Language First: Community-based Literacy Programmes for Minority Language Contexts in Asia. Bangkok: UNESCO Bangkok, 2005., 96.

Kosonen, K., & Benson, C. (2013). Introduction: Inclusive teaching and learning through the use of non-dominant languages and cultures. In *Language issues in comparative education* (pp. 1-16): Brill Sense.

Krashen, S. D., & Seliger, H. W. (1975). The essential contributions of formal instruction in adult second language learning. *Tesol Quarterly*, 173-183.

Krishna, S., Ojha, A. K., & Barrett, M. (2017). Competitive advantage in the software industry: an analysis of the Indian experience. In *Information technology in context* (pp. 182-197): Routledge.

Kyeyune, R. (2003). Challenges of using English as a medium of instruction in multilingual contexts: A view from Ugandan classrooms. *Language culture and curriculum, 16*(2), 173-184.

Laitin, D. D., & Ramachandran, R. (2016). Language policy and human development. *American political science review, 110*(3), 457-480.

Land, K. C., McCall, P. L., & Nagin, D. S. (1996). A comparison of Poisson, negative binomial, and semiparametric mixed Poisson regression models: With empirical applications to criminal careers data. *Sociological Methods & Research, 24*(4), 387-442.

Levine, G. S. (2003). Student and instructor beliefs and attitudes about target language use, first language use, and anxiety: Report of a questionnaire study. *The modern language journal, 87*(3), 343-364.

Lawless, J. F. (1987). Negative binomial and mixed Poisson regression. *The Canadian Journal of Statistics/La Revue Canadienne de Statistique*, 209-225.

Lipman, P. (2004). High stakes education: Inequality, globalization, and urban school reform: Psychology Press.

Littlewood, W., & Yu, B. (2011). First language and target language in the foreign language classroom. *Language teaching, 44*(1), 64-77.

Liu, W. (2023). The theory of second language development for international students. *Journal for Multicultural Education*.

Lone, R. A., & Efstratopoulou, M. (2022). Linguistically-Responsive Educational Framework for Multilingual Contexts: Supporting Children's Academic Achievement. In *Rethinking Inclusion and Transformation in Special Education* (pp. 196-213): IGI Global.

Mac Iver, M. A., & Kemper, E. (2002). The impact of Direct Instruction on elementary students' reading achievement in an urban school district. *Journal of Education for Students Placed at Risk, 7*(2), 197-220.

Macaro, E., Curle, S., Pun, J., An, J., & Dearden, J. (2018). A systematic review of English medium instruction in higher education. *Language teaching, 51*(1), 36-76.

Manan, S. A., David, M. K., & Channa, L. A. (2019). Opening Ideological and implementational spaces for multilingual/plurilingual policies and practices in education: a snapshot of scholarly activism in Pakistan. *Current Issues in Language Planning, 20*(5), 521-543.

Manan, S. A., David, M. K., & Dumanig, F. P. (2015). Disjunction between language policy and children's sociocultural ecology–an analysis of English-medium education policy in Pakistan. *Language and Education, 29*(5), 453-473.

Manan, S. A., David, M. K., Dumanig, F. P., & Naqeebullah, K. (2015). Politics, economics and identity: Mapping the linguistic landscape of Kuala Lumpur, Malaysia. *International Journal of Multilingualism, 12*(1), 31-50.

Manan, S. A., Dumanig, F. P., & David, M. K. (2017). The English-medium fever in Pakistan: Analyzing policy, perceptions and practices through additive bi/multilingual education lens. *International Journal of Bilingual Education and Bilingualism, 20*(6), 736-752.

Manan, S. A., & Hajar, A. (2022). "Disinvestment" in Learners' Multilingual Identities: English Learning, Imagined Identities, and Neoliberal Subjecthood in Pakistan. *Journal of Language, Identity & Education*, 1-16.

Mansoor, S. (2004). The Status and Role of Regional Languages in Higher Education in Pakistan. *Journal of Multilingual and Multicultural Development, 25*(4), 333-353. doi:10.1080/01434630408666536

Manton, K. G., Woodbury, M. A., & Stallard, E. (1981). A variance components approach to categorical data models with heterogenous cell populations: analysis of spatial gradients in lung cancer mortality rates in North Carolina counties. *Biometrics*, 259-269.

Marongedza, L., Hlungwani, P. M., & Hove, P. (2023). Institutional constraints affecting secondary school student performance: A case study of rural communities in Zimbabwe. *Cogent Education, 10*(1), 2163552.

Marschak, J. (1965). Economics of language. *Behavioral Science, 10*(2), 135-140.

Maume, D. J., & Wilson, G. (2015). Determinants of declining wage mobility in the new economy. *Work and Occupations, 42*(1), 35-72.

McMahon, W. W. (2000). Education and development: Measuring the social benefits: Clarendon Press.

Meeuwisse, M., Severiens, S. E., & Born, M. P. (2010). Learning environment, interaction, sense of belonging and study success in ethnically diverse student groups. *Research in Higher Education, 51*(6), 528-545.

Meighan, P. J. (2023). "What is language for us?": Community-based Anishinaabemowin language planning using TEK-nology. *Language Policy*, 1-31.

Miaou, S.-P. (1994). The relationship between truck accidents and geometric design of road sections: Poisson versus negative binomial regressions. *Accident Analysis & Prevention, 26*(4), 471-482.

Moats, L. C. (1994). The missing foundation in teacher education: Knowledge of the structure of spoken and written language. *Annals of dyslexia, 44*, 81-102.

Mohanty, A. K. (2019). Language policy in education in India. In *The Routledge international handbook of language education policy in Asia* (pp. 329-340): Routledge.

Mohanty, A. K., Panda, M., Phillipson, R., & Skutnabb-Kangas, T. (2009). *Multilingual education for social justice: Globalising the local*: Orient Blackswan New Delhi, India.

Montalvo, J. G., & Reynal-Querol, M. (2005). Ethnic diversity and economic development. *Journal of Development Economics, 76*(2), 293-323.

Montalvo, J. G., & Reynal-Querol, M. (2014). Cultural diversity, conflict, and economic development. In *Handbook of the Economics of Art and Culture* (Vol. 2, pp. 485-506): Elsevier.

Mweri, J. (2020). Sustainable Development Goals: Reaching People through Their Mother Tongue. *Linguistics and Literature Studies, 8*(1).

Nikula, T. (2007). Speaking English in Finnish content-based classrooms. *World Englishes, 26*(2), 206-223.

Núñez, A.-M., Rios-Aguilar, C., Kanno, Y., & Flores, S. M. (2016). English Learners and Their Transition to Postsecondary Education: Higher Education: Handbook of Theory and Research. *Higher education: Handbook of theory and research*, 41-90.

Perez, A. D., & Hirschman, C. (2009). The changing racial and ethnic composition of the US population: Emerging American identities. *Population and development review, 35*(1), 1-51.

Phillipson, R. (1992). *Linguistic imperialism*: Oxford University Press.

Pinnock, H., & Vijayakumar, G. (2009). Language and education: the missing link: how the language used in schools threatens the achievement of Education For All: CfBT Education Trust Berkshire, England.

Poisson, S. D. (1837). Probabilité des jugements en matière criminelle et en matière civile, précédées des règles générales du calcul des probabilitiés. *Paris, France: Bachelier, 1*, 1837.

Pool, J. (1972). (1972). National development and language diversity.

Raabe, T., & Beelmann, A. (2011). Development of ethnic, racial, and national prejudice in childhood and adolescence: A multinational meta-analysis of age differences. *Child development, 82*(6), 1715-1737.

Rahman, M. M., Islam, M. S., Karim, A., Chowdhury, T. A., Rahman, M. M., Seraj, P. M. I., & Singh, M. K. M. (2019). English language teaching in Bangladesh today: Issues, outcomes and implications. *Language Testing in Asia, 9*(1), 1-14.

Rahman, M. M., & Singh, M. K. M. (2020). Language ideology of English-medium instruction in higher education: A case study from Bangladesh. *English Today, 36*(4), 40-46.

Rahman, T. (1998). Language and ethnicity in Pakistan. In *Text in Education and Society* (pp. 238-245): World Scientific.

Rahman, T. (2020a). English in Pakistan: Past, present and future. Functional variations in English: Theoretical considerations and practical challenges, 127-148.

Rahman, T. (2020b). Pakistani English. *The Handbook of Asian Englishes*, 279-296.

Rajkumar, A. S., & Swaroop, V. (2008). Public spending and outcomes: Does governance matter? *Journal of Development Economics, 86*(1), 96-111.

Ranis, G., Stewart, F., & Ramirez, A. (2000). Economic growth and human development. *World Development, 28*(2), 197-219.

Richards, J. C., & Schmidt, R. W. (2014). *Language and communication*: Routledge.

Rong, C., & Abdullah, M. S. H. B. (2022). A Case Study of Second Language Acquisition: A Case Study of English Home Education Model for Children in China.

Seargeant, P. (2012). *Exploring world Englishes: Language in a global context*: Routledge.

Selvi, A. F., Yazan, B., & Mahboob, A. (2023). Research on "native" and "non-native" English-speaking teachers: Past developments, current status, and future directions. *Language teaching*, 1-41.

Shaeffer, S. (2019). Inclusive education: A prerequisite for equity and social justice. *Asia Pacific Education Review, 20*(2), 181-192.

Sheeba, C. (2021). The Link between Mother Tongue and creativity. *International Journal of Modern Agriculture, 10*(1), 901-905.

Sierens, S., & Van Avermaet, P. (2014). Language diversity in education: Evolving from multilingual education to functional multilingual learning. *Managing diversity in education: Languages, policies, pedagogies*, 204-222.

Skutnabb-Kangas, T. (2000). Linguistic genocide in education--or worldwide diversity and human rights? : Routledge.

Sleeter, C. E. (2012). Confronting the marginalization of culturally responsive pedagogy. *Urban Education, 47*(3), 562-584.

Steinlen, A., & Piske, T. (2022). Bilingual Programmes in Primary Schools. *English in Primary Education: Concepts, Research, Practice*.

Stibbard, R. (1998). *The principled use of translation in foreign language teaching.* Paper presented at the Translation & language teaching: language teaching & translation.

Tamim, T. (2021). Language, Class, and Education: Deconstructing the Centre to Rethink Inclusivity in Education in Pakistan. *Cogent Education, 8*(1), 1897933.

Teimouri, Y., Goetze, J., & Plonsky, L. (2019). Second language anxiety and achievement: A meta-analysis. *Studies in Second Language Acquisition, 41*(2), 363-387.

Thomas, W. P., & Collier, V. P. (2002). A national study of school effectiveness for language minority students' long-term academic achievement.

Tsui, A. B., & Tollefson, J. W. (2004). The centrality of medium-of-instruction policy in sociopolitical processes. *Medium of instruction policies: Which agenda*, 1-18.

Tupas, R. (2015). Inequalities of multilingualism: Challenges to mother tongue-based multilingual education. *Language and Education, 29*(2), 112-124.

UNESCO. (2012). Youth and skills: Putting education to work. Retrieved from

Van den Boer, M., & Zeguers, M. H. (2022). Beyond words: An analysis of skills underlying reading and vocabulary acquisition in three foreign languages. *Bilingualism: Language and Cognition, 25*(2), 321-336.

Wallis, W. A. (1936). The Poisson Distribution and the Supreme Court. *Journal of the American Statistical Association, 31*(194), 376-380.

Walter, S. (2009). Language as a variable in primary education. In: Arlington, TX: SIL International.

Wang, K., Zhao, S., & Jackson, E. (2020). Investigating exposure measures and functional forms in urban and suburban intersection safety performance functions using generalized negative binomial-P model. *Accident Analysis & Prevention, 148*, 105838.

Williams, E. (2014). Bridges and barriers: Language in African education and development: Routledge.

Williams, P. E. (2003). Roles and competencies for distance education programs in higher education institutions. *The American Journal of Distance Education, 17*(1), 45-57.

Willig, A. C. (1985). A meta-analysis of selected studies on the effectiveness of bilingual education. *Review of educational research, 55*(3), 269-317.

Wong, K. M., & Benson, C. (2019). Language as gatekeeper for equitable education: Multilingual education in Cambodia. *Education, ethnicity and equity in the multilingual Asian context*, 69-86.

Yasmin, F., Zaman, A., & Khan, K. (2023). Historical Perspective and Current Practices of Language in Education Planning in Pakistan. *PERENNIAL JOURNAL OF HISTORY, 4*(1), 62-81.

Yasmin, S., Eluru, N., & Haque, M. M. (2022). Addressing endogeneity in modeling speed enforcement, crash risk and crash severity simultaneously. *Analytic methods in accident research, 36*, 100242.

Yi, S. (2022). English in Asia: an Asian language or a lingua franca? Is English an Asian Language?, by Andy Kirkpatrick and Wang Lixun, eds. Queensland and Hong Kong: Cambridge University Press, 2021, viii+ 238 pp. ISBN: 978-1-107-13468-3. In: Taylor & Francis.

Yiakoumetti, A. (2012). Harnessing Linguistic Variation to Improve Education. Rethinking Education. Volume 5: ERIC.

Yip, D. Y., Tsang, W. K., & Cheung, S. P. (2003). Evaluation of the effects of medium of instruction on the science learning of Hong Kong secondary students: Performance on the science achievement test. *Bilingual Research Journal, 27*(2), 295-331.

2.7 Appendix 2A: Supplementary Estimates

POISSON Regression Estimates of Language Diversity (HLCI) and Education Enrollment

	Primary Education Enrollment		Secondary Education Enrollment		Higher Education Enrollment	
variables	**coefficient**	**irr**	**coefficient**	**irr**	**coefficient**	**irr**
HLCI	-0.452**	0.636**	-0.223	0.800	0.303**	1.354**
	(0.207)	(0.132)	(0.159)	(0.128)	(0.122)	(0.165)
LEEX	0.306***	1.358***	0.403***	1.496***	0.627***	1.871***
	(0.0640)	(0.0869)	(0.0454)	(0.0679)	(0.0566)	(0.106)
LNEY	0.312***	1.366***	0.357***	1.429***	0.467***	1.595***
	(0.102)	(0.140)	(0.0761)	(0.109)	(0.0557)	(0.0888)
HDI	-0.728**	0.483**	1.067***	2.905***	0.0517	1.053
	(0.371)	(0.179)	(0.240)	(0.697)	(0.314)	(0.330)
AHS	-0.126**	0.882**	0.0530	1.054	-0.00630	0.994
	(0.0549)	(0.0484)	(0.0365)	(0.0385)	(0.0440)	(0.0437)
PGR	0.0528	1.054	-0.0346	0.966	0.0164	1.017
	(0.0673)	(0.0710)	(0.0580)	(0.0560)	(0.0440)	(0.0448)
PP	0.568***	1.764***	0.183**	1.200**	-0.322***	0.724***
	(0.123)	(0.217)	(0.0779)	(0.0935)	(0.0849)	(0.0615)
PS	0.128	1.136	0.202*	1.223*	0.157	1.171
	(0.178)	(0.202)	(0.108)	(0.132)	(0.125)	(0.146)
PB	-0.163	0.849	0.178*	1.195*	0.119	1.126
	(0.171)	(0.145)	(0.107)	(0.128)	(0.121)	(0.137)
Constant	-2.075	0.126	-5.498***	0.00410***	-11.05***	1.58e-05***
	(1.283)	(0.161)	(0.951)	(0.00389)	(0.603)	(9.55e-06)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

POISSON Regression Estimates of Language Diversity (LDI) and Education Enrollment

	Primary Education Enrollment		Secondary Education Enrollment		Higher Education Enrollment	
Variables	**coefficient**	**irr**	**coefficient**	**irr**	**coefficient**	**irr**
LDI	0.453**	1.572**	0.222	1.249	-0.302**	0.739**
	(0.207)	(0.326)	(0.159)	(0.199)	(0.121)	(0.0896)
LEEX	0.306***	1.358***	0.403***	1.496***	0.627***	1.871***
	(0.0639)	(0.0868)	(0.0454)	(0.0679)	(0.0566)	(0.106)
LNEY	0.312***	1.366***	0.357***	1.429***	0.467***	1.595***
	(0.102)	(0.140)	(0.0761)	(0.109)	(0.0557)	(0.0889)
HDI	-0.727**	0.483**	1.067***	2.906***	0.0514	1.053
	(0.371)	(0.179)	(0.240)	(0.697)	(0.314)	(0.330)
AHS	-0.126**	0.882**	0.0531	1.055	-0.00652	0.993
	(0.0549)	(0.0485)	(0.0365)	(0.0385)	(0.0440)	(0.0437)
PGR	0.0526	1.054	-0.0348	0.966	0.0166	1.017
	(0.0673)	(0.0709)	(0.0580)	(0.0560)	(0.0441)	(0.0448)
PP	0.568***	1.764***	0.183**	1.200**	-0.322***	0.724***
	(0.123)	(0.217)	(0.0779)	(0.0935)	(0.0849)	(0.0615)
PS	0.128	1.137	0.202*	1.224*	0.157	1.170
	(0.178)	(0.202)	(0.108)	(0.132)	(0.125)	(0.146)
PB	-0.163	0.850	0.179*	1.196*	0.119	1.126
	(0.171)	(0.145)	(0.107)	(0.128)	(0.121)	(0.137)
Constant	-2.531*	0.0796*	-5.721***	0.00328***	-10.75***	2.15e-05***
	(1.374)	(0.109)	(1.042)	(0.00341)	(0.664)	(1.43e-05)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

POISSON Regression Estimates of Language Diversity (HLCI) and Education Enrollment- With Endogeneity

Variables	(1) Primary Education Enrollment	(2) Secondary Education Enrollment	(3) Higher Education Enrollment
LEEX	0.628***	0.771***	1.053***
	(0.0971)	(0.0838)	(0.0624)
HLCI	-0.521**	-0.175	0.407***
	(0.220)	(0.182)	(0.150)
HDI	-1.187**	0.426	-0.421
	(0.551)	(0.411)	(0.383)
PGR	-0.00154	-0.0175	0.0331
	(0.0624)	(0.0570)	(0.0444)
PP	0.959***	0.303***	-0.0684
	(0.125)	(0.0789)	(0.0696)
PS	0.869***	0.485***	0.607***
	(0.139)	(0.101)	(0.108)
PB	0.392**	0.358**	0.279*
	(0.173)	(0.147)	(0.154)
Constant	-2.611**	-4.624***	-9.900***
	(1.136)	(0.909)	(0.690)
Observations	124	124	124

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

POISSON Regression Estimates of Language Diversity (LDI) And Education Enrollment- With Endogeneity

Variables	(1) Primary Education Enrollment	(2) Secondary Education Enrollment	(3) Higher Education Enrollment
LEEX	0.628***	0.771***	1.053***
	(0.0972)	(0.0839)	(0.0624)
LDI	0.521**	0.175	-0.405***
	(0.220)	(0.182)	(0.150)
HDI	-1.186**	0.426	-0.420
	(0.551)	(0.411)	(0.383)
PGR	-0.00165	-0.0176	0.0333
	(0.0624)	(0.0570)	(0.0444)
PP	0.958***	0.302***	-0.0681
	(0.125)	(0.0789)	(0.0696)
PS	0.869***	0.485***	0.607***
	(0.139)	(0.101)	(0.108)
PB	0.392**	0.358**	0.279*
	(0.173)	(0.147)	(0.154)
Constant	-3.135***	-4.799***	-9.493***
	(1.200)	(1.010)	(0.767)
Observations	124	124	124

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

POISSON Regression Estimates of Language Diversity (HLCI) and Education Enrollment- With Control Function

Variables	(1) Primary Education Enrollment	(2) Secondary Education Enrollment	(3) Higher Education Enrollment
HLCI	-0.566***	-0.372**	0.0712
	(0.204)	(0.157)	(0.126)
LNEY	0.633***	0.779***	1.124***
	(0.0809)	(0.0633)	(0.0507)
HDI	-0.217	1.739***	1.098***
	(0.341)	(0.214)	(0.261)
AHS	-0.0979*	0.0896**	0.0507
	(0.0545)	(0.0360)	(0.0414)
PGR	0.0408	-0.0505	-0.00820
	(0.0674)	(0.0582)	(0.0443)
PP	0.445***	0.0207	-0.574***
	(0.120)	(0.0801)	(0.0925)
PS	-0.142	-0.154	-0.396***
	(0.167)	(0.103)	(0.138)
PB	-0.464***	-0.217**	-0.497***
	(0.176)	(0.108)	(0.123)
V1HAT	0.306***		
	(0.0640)		
V2HAT		0.403***	
		(0.0454)	
V3HAT			0.627***
			(0.0566)
Constant	-3.062**	-6.796***	-13.07***
	(1.271)	(0.941)	(0.622)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

POISSON Regression Estimates of Language Diversity (HLCI) And Education Enrollment- With Control Function

Variables	(1) Primary Education Enrollment	(2) Secondary Education Enrollment	(3) Higher Education Enrollment
LDI	0.565***	0.371**	-0.0708
	(0.203)	(0.157)	(0.125)
LNEY	0.633***	0.779***	1.124***
	(0.0809)	(0.0633)	(0.0507)
HDI	-0.216	1.739***	1.098***
	(0.341)	(0.213)	(0.261)
AHS	-0.0977*	0.0897**	0.0505
	(0.0545)	(0.0360)	(0.0414)
PGR	0.0406	-0.0507	-0.00804
	(0.0674)	(0.0582)	(0.0443)
PP	0.444***	0.0206	-0.574***
	(0.120)	(0.0801)	(0.0925)
PS	-0.142	-0.153	-0.396***
	(0.167)	(0.103)	(0.139)
PB	-0.463***	-0.217**	-0.497***
	(0.176)	(0.108)	(0.123)
V7HAT	0.306***		
	(0.0639)		
V8HAT		0.403***	
		(0.0454)	
V9HAT			0.627***
			(0.0566)
CONSTANT	-3.631***	-7.169***	-13.00***
	(1.356)	(1.030)	(0.690)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

2.8 Appendix 2B: Languages by Population

The languages of Pakistan are listed in order of their population of first-languagespeakers within the country, from highest to lowest. The entries report just the population and status elements.

Languages by Population in Pakistan

	Language name	Users	Status	Source
1.	Punjabi, Western	65,000,000	Developing	(2017 census)
2.	Sindhi	31,000,000	Wider communication	(2017 census)
3.	Saraiki	25,900,000	Developing	(2017 census)
4.	Pashto, Northern	24,300,000	Developing	(2017 census)
5.	Punjabi, Eastern	15,000,000	Developing	(2017 census)
6.	Urdu	15,000,000	National	(2018 census)
7.	Pashto, Central	8,490,000	Vigorous	(2017 census)
8.	Pashto, Southern	5,960,000	Dispersed	(2017 census)
9.	Hindko, Northern	5,250,000	Developing	2020 census
10.	Balochi, Eastern	2,930,000	Developing	(2017 census)
11.	Balochi, Eastern	2,930,000	Developing	(2017 census)
12.	Brahui	2,640,000	Developing	(2017 census)
13.	Pahari-Potwari	2,500,000	Dispersed	Lothers and Lothers (2007)
14.	Balochi, Southern	2,450,000	Developing	(2017 census)
15.	Hindko, Southern	1,750,000	Developing	Lunsford et al., (2020)
16.	Balochi, Western	1,050,000	Developing	(2017 census)
17.	Dari	921,000	Developing	Joshua Project (2022)
18.	Shina	688,000	Vigorous	Census 2018
19.	Khowar	550,000	Wider communication	Lunsford et al., (2020)
20.	Shina, Kohistani	458,000	Vigorous	PBS 2018
21.	Balti	425,000	Developing	PBS 2018
22.	Gujari	391,000	Developing	PBS 2018
23.	Kashmiri	361,000	Developing	2017 census
24.	Koli, Parkari	358,000	Developing	PBS 2018
25.	Rohingya	350,000	Unestablished	The Arakan Project (2017)

26.	Bengali	326,000	Unestablished	PBS 2018
27.	Bagri	306,000	Vigorous	PBS 2018
28.	Uzbek, Southern	267,000	Unestablished	Joshua Project (2022)
29.	Kohistani, Indus	200,000	Developing	(1992)
30.	Dhatki	190,000	Developing	PBS 2018
31.	Persian, Iranian	185,000	Unestablished	PBS 2018
32.	Koli, Wadiyari	179,000	Developing	PBS 2018
33.	Marwari	164,000	Developing	PBS 2018
34.	Waneci	141,000	Vigorous	PBS 2018
35.	Koli, Kachi	130,000	Developing	PBS 2018
36.	Torwali	130,000	Threatened	Lunsford et al., (2020)
37.	Burushaski	126,000	Threatened	(2018)
38.	Gawri	100,000	Threatened	Lunsford et al., (2020)
39.	Hazaragi	97,600	Threatened	PBS 2018
40.	Oadki	76,100	Vigorous	PBS 2018
41.	Konkani, Goan	67,400	Unestablished	PBS 2018
42.	Sindhi Bhil	56,500	Vigorous	
43.	Jogi	50,000	Vigorous	(1996 R. Hoyle)
44.	Kacchi	50,000	Vigorous	(1998)
45.	Bateri	39,000	Vigorous	PBS 2018
46.	Gurgula	35,300	Vigorous	(2000)
47.	Goaria	25,400	Vigorous	(2000)
48.	Khetrani	20,000	Vigorous	PBS 2018
49.	Loarki	20,000	Vigorous	(1998)
50.	Sansi	20,000	Shifting	PBS 2018
51.	Dehwari	19,000	Vigorous	PBS 2018
52.	English	16,300	National	PBS 2018
53.	Jadgali	15,600	Vigorous	(2004 J. Leclerc)
54.	Palula	14,400	Developing	PBS 2018
55.	Lasi	14,300	Vigorous	PBS 2018
56.	Wakhi	14,200	Vigorous	PBS 2018
57.	Turkmen	10,900	Unestablished	(2016)
58.	Chinese, Mandarin	10,000	Unestablished	PBS 2018
59.	Ghera	10,000	Vigorous	(1998)
60.	Uyghur	10,000	Unestablished.	PBS 2018
61.	Kati	7,800	Vigorous	PBS 2018
62.	Kalkoti	6,600	Shifting	PBS 2018
63.	Turkish	6,000	Unestablished	PBS 2018
64.	Yadgha	6,000	Threatened	Lunsford et al., (2020)

65.	Dameli	5,000	Vigorous	(Perder 2013)
66.	Jandavra	5,000	Vigorous	(1998)
67.	Kalasha	5,000	Vigorous	Heegård Petersen 2006
68.	Ormuri	5,000	Threatened	(2018)
69.	Vaghri	4,800	Vigorous	(1998)
70.	Gawar-Bati	4,000	Vigorous	(2021)
71.	Savi	4,000	Vigorous	Forum of Language Initiatives (2021)
72.	Ushojo	3,000	Threatened	(2018)
73.	Kamviri	2,000	Threatened	(2004)
74.	Tamil	2,000	Threatened	(2020 BBC)
75.	Chilisso	1,000	Threatened	(1992 SIL)
76.	Gowro	1,000	Threatened	(2003 J. Baart)
77.	Kabutra	1,000	Threatened	(1998)
78.	Kundal Shahi	700	Moribund	Rehman and Baart (2005)
79.	Mankiyali	500	Threatened	(Anjum 2016)
80.	Brokskat	400	Threatened	(2022)
81.	Domaaki	340	Nearly extinct	Matthias (2011)
82.	Aer	100	Threatened	(1998)
83.	Bhaya	70	Threatened	(1998)
84.	Sarikoli	70	Nearly extinct	(Torwali 2021)
85.	Badeshi	No known L1 speakers	Dormant	(2000)
86.	Gujarati		Dispersed	(1998)
87.	Memoni		Shifting	(1998)

2.9 Appendix 2C: Languages by Status

The languages of Pakistan are listed in order of their status within the country as represented by their level on the EGIDs scale (Lewis and Simons, 2010). The language entries arereduced to just the information elements relevant to assessing the EGIDS level: population, status, language use, language development, and writing.

Languages by Status in Pakistan

	Language	Users	Status	Source
1.	English	104,016,300	National	(2017 census)
2.	Urdu	164,000,000	National	(2017 census)
3.	Khowar	550,000	Wider communication	(2017 census)
4.	Sindhi	31,000,000	Wider communication	(2017 census)
5.	Balochi, Eastern	2,930,000	Developing	(2017 census)
6.	Balochi, Southern	2,450,000	Developing	PBS 2018
7.	Balochi, Western	1,050,000	Developing	PBS 2018
8.	Balti	425,000	Developing	PBS 2018
9.	Brahui	2,640,000	Developing	(2020 census)
10.	Dhatki	190,000	Developing	(2020)
11.	Gujari	391,000	Developing	(1992)
12.	Hindko, Northern	5,250,000	Developing	(2017 census)
13.	Hindko, Southern	550,000	Developing	(2017 census)
14.	Kohistani, Indus	31,000,000	Developing	(2017 census)
15.	Koli, Kachi	130,000	Developing	PBS 2018
16.	Koli, Parkari	358,000	Developing	PBS 2018
17.	Koli, Wadiyari	179,000	Developing	PBS 2018
18.	Marwari	164,000	Developing	(2017 census)
19.	Palula	14,400	Developing	(2017 census)
20.	Pashto, Northern	24,300,000	Developing	(2017 census
21.	Punjabi, Western	65,000,000	Developing	(2017 census)
22.	Saraiki	5,900,000	Developing	(2017 census)
23.	Dari	921,000	Dispersed	Joshua Project (2022)
24.	Gujarati		Dispersed	(2017 census)

25.	Kashmiri	361,000	Dispersed	(2017 census)
26.	Pashto, Southern	5,960,000	Dispersed	(2017 census)
27.	Punjabi, Eastern	15,000,000	Dispersed	(2017 census)
28.	Bagri	306,000	Vigorous	PBS 2018
29.	Bateri	39,000	Vigorous	PBS 2018
30.	Burushaski	126,000	Vigorous	PBS 2018
31.	Dameli	5,000	Vigorous	(Perder 2013)
32.	Dehwari	19,000	Vigorous	(2018)
33.	Gawar-Bati	4,000	Vigorous	Pakistan (2021).
34.	Ghera	10,000	Vigorous	1998
35.	Goaria	25,400	Vigorous	(2000)
36.	Gurgula	35,300	Vigorous	(2000)
37.	Hazaragi	97,600	Vigorous	PBS 2018
38.	Jadgali	15,600	Vigorous	(2004 J. Leclerc).
39.	Jandavra	5,000	Vigorous	(1998)
40.	Jogi	50,000	Vigorous	(1996 R. Hoyle).
41.	Kacchi	50,000	Vigorous	(1998
42.	Kalasha	5,000	Vigorous	(Heegård Petersen 2006).
43.	Kamviri	2,000	Vigorous	(2004).
44.	Kati	7,800	Vigorous	PBS 2018
45.	Khetrani	20,000	Vigorous	PBS 2018
46.	Lasi	14,300	Vigorous	PBS 2018
47.	Loarki	20,000	Vigorous	(1998)
48.	Oadki	76,100	Vigorous	PBS 2018
49.	Pahari-Potwari	2,500,000	Vigorous	Lothers and Lothers (2007)
50.	Pashto, Central	8,490,000	Vigorous	2017 census
51.	Savi	4,000	Vigorous	Forum of Language Initiatives (2021)
52.	Shina	688,000	Vigorous	PBS 2018
53.	Shina, Kohistani	458,000	Vigorous	PBS 2018
54.	Sindhi Bhil	56,500	Vigorous	(2000)
55.	Vaghri	4,800	Vigorous	PBS 2018
56.	Wakhi	14,200	Vigorous	PBS 2018
57.	Waneci	141,000	Vigorous	PBS 2018
58.	Aer	100	Threatened	(1998).
59.	Bhaya	70	Threatened	(1998).
60.	Brokskat	400	Threatened	(2022).
61.	Chilisso	1,000	Threatened	(1992

62.	Gawri	100,000	Threatened	Lunsford et al., (2020)
63.	Gowro	1,000	Threatened	(2003 J. Baart)
64.	Kabutra	1,000	Threatened	(1998
65.	Mankiyali	500	Threatened	Anjum 2016)
66.	Ormuri	5,000	Threatened	PBS 2018
67.	Tamil	2,000	Threatened	(2020 BBC).
68.	Torwali	130,000	Threatened	Lunsford et al., (2020)
69.	Ushojo	3,000	Threatened	PBS 2018
70.	Yadgha	6,000	Threatened	Lunsford et al., (2020)
71.	Kalkoti	6,600	Shifting	PBS 2018
72.	Memoni		Shifting	PBS 2018
73.	Sansi	20,000	Shifting	PBS 2018
74.	Kundal Shahi	700	Moribund	Rehman and Baart (2005)
75.	Domaaki	340	Nearly extinct	Matthias (2011)
76.	Sarikoli	70	Nearly extinct	(Torwali 2021)
77.	Badeshi	2,830	Dormant	Ethnicpopulation (2000)
78.	Bengali	326,000	Unestablished	(2017 census)
79.	Chinese, Mandarin	10,000	Unestablished	(2017 census)
80.	Konkani, Goan	67,400	Unestablished	PBS 2018
81.	Persian, Iranian	185,000	Unestablished	PBS 2018
82.	Rohingya	350,000	Unestablished	The Arakan Project (2017)
83.	Turkish	6,000	Unestablished	PBS 2018
84.	Turkmen	10,900	Unestablished	PBS 2018
85.	Uyghur	10,000	Unestablished	PBS 2018
86.	Uzbek, Southern	267,000	Unestablished	Joshua Project (2022)

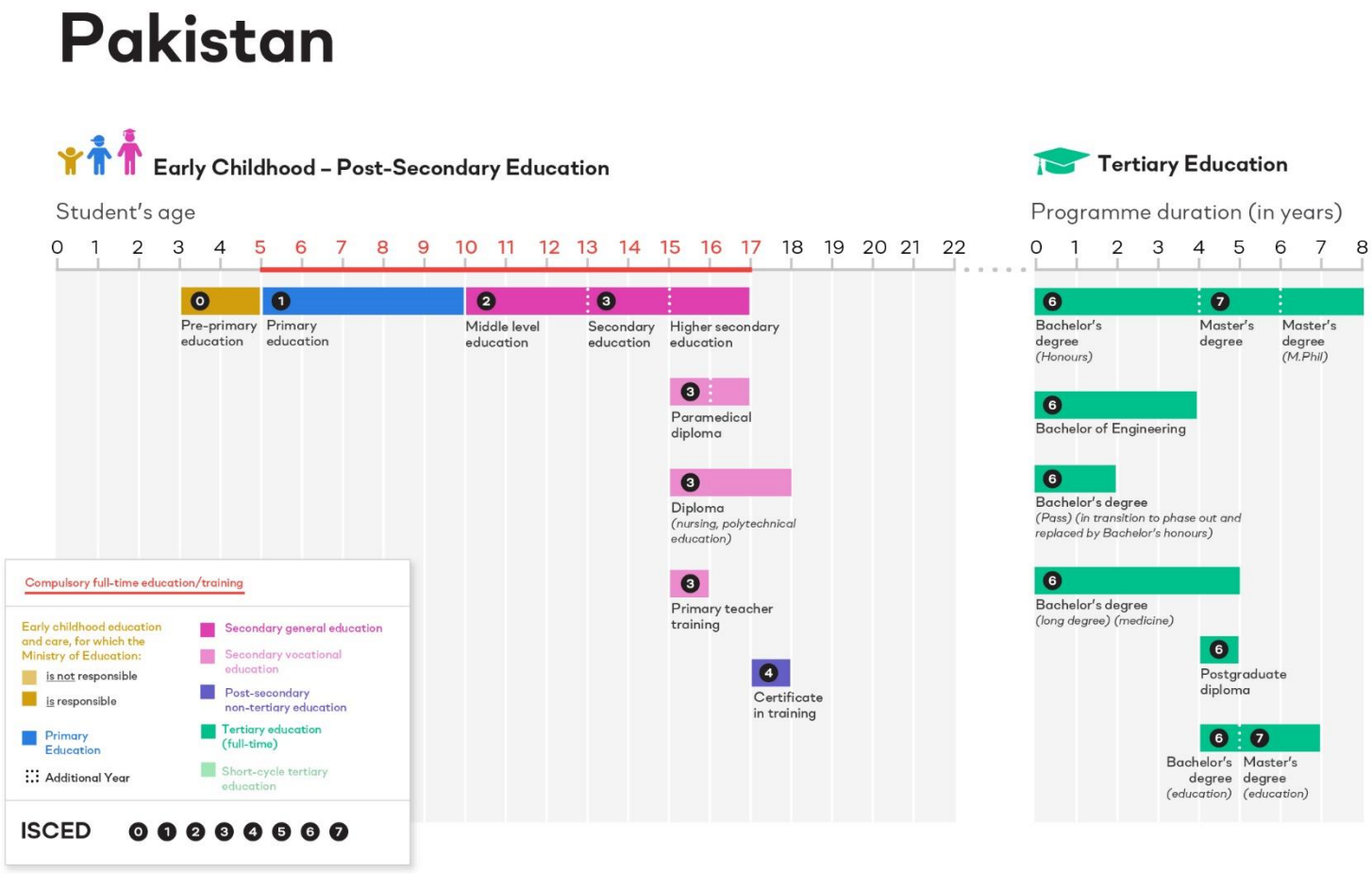
Appendix 2D: Languages Diversity Index (HLCI) by District in Pakistan

District-wise language diversity Index

District	Language Diversity Index	District	Language Diversity Index	District	Language Diversity Index
Orakzai	0.99185	Gujranwala	0.915672	Tank	0.696212
Lower Dir	0.98597	Khairpur	0.915143	Kharan	0.692676
Upper Dir	0.98597	Swabi	0.912742	Shaheed	0.692249
Bajur	0.98425	Shahdadk	0.911764	D. G. Khan	0.67845
Shaheed	0.98348	Bahawaln	0.905993	Lahore	0.672257
Karak	0.983246	Sialkot	0.901892	Haripur	0.668621
Charsada	0.982707	Barkhan	0.899152	Tando Al	0.664021
Mohmand	0.981755	Chiniot	0.896923	Bhakhar	0.655612
Hangu	0.97909	Tando Mu	0.893827	Sanghar	0.619827
Nankana	0.976851	Khushab	0.892547	Khuzdar	0.61649
Khyber	0.976678	Kashmore	0.890914	Sibbi	0.60425
Tharpark	0.97502	Jhang	0.887422	Sohbatpu	0.60425
Lakki Ma	0.97382	Badin	0.887229	Mianwali	0.601214
Kurram	0.968314	Sargodha	0.886983	Vehari	0.597396
Malakand	0.967993	Gwadar	0.878093	Mir Pur	0.59517
Kohistan	0.967158	Umer Kot	0.874238	Rajanpur	0.594929
Mardan	0.965426	Chakwal	0.873608	Lodhran	0.583738
Bannu	0.965101	Ghotki	0.872833	Khanewal	0.577652
Okara	0.961229	Chitral	0.870347	Layyah	0.523028
Sahiwal	0.961229	Kohlu	0.870283	D. I. Khan	0.521701
Sujawal	0.959581	Thatta	0.864214	Bahawalpur	0.516043
T.T. Sin	0.957744	Nowshera	0.863112	Karachi east	0.513157
Dadu	0.957453	Shikarpur	0.85752	Rawalpindi	0.497127
Qilla Sa	0.957356	Matiari	0.856644	Mansehra	0.492751
Qilla Ab	0.956959	Swat	0.842986	Rahim Yar khan	0.485074

Ziarat	0.952923	Loralai	0.819552	Multan	0.472806
North Wa	0.952088	Peshawar	0.816561	Attock	0.470499
Kech/Tur	0.952064	Kasur	0.813846	Nushki	0.470483
Bunair	0.951909	Nowshero	0.803632	Korangi	0.404716
Pishin	0.951507	Jacobaba	0.788327	Hyderabad	0.374398
Narowal	0.945862	Muzaffar	0.783816	Quetta	0.35492
Larkana	0.945838	Jehlum	0.756191	Islamabad	0.330276
Sheikhupura	0.942486	Abbottabad	0.754493	Jaffarabad	0.319849
Pakpattan	0.940378	Kalat	0.748413	Lasbela	0.313444
Shangla	0.936887	Mastung	0.746018	Kachhi/	0.299869
South Wa	0.932589	Washuk	0.723261	Nasirabasd	0.273133
Mandi Ba	0.931663	Jamshoro	0.722978	Sherani	0.255772
Gujrat	0.931617	Awaran	0.722085	Karachi west	0.224092
Faisalabad	0.931286	Harnai	0.713268	Karachi central	0.222659
Tor Garh	0.928751	Sukkur	0.709074	Karachi South	0.20049
Hafizabad	0.927731	Batagram	0.696806	Karachi	0.155869
Dera Bug	0.922676	Kohat	0.696514	Duki	

2.10 Appendix 2D: Education Structure in Pakistan



Definition of literacy

Year of census or survey	Total	Male	Female	Urban	Rural	Definition of being "literate"	Age group
1951 (West Pakistan)	17.9%	21.4%	13.9%	N/A	N/A	One who can read a clear print in any language	All ages
1961 (West Pakistan)	16.9%	26.1%	6.7%	34.8%	10.6%	One who can read with understanding a simple letter in any language	Age 5 and above
1972	21.7%	30.2%	11.6%	41.5%	14.3%	One who can read and write in some language with understanding	Age 10 and above
1981	26.2%	35.1%	16.0%	47.1%	17.3%	One who can read the newspaper and write a simple letter	Age 10 and above
1998	43.92%	54.81%	32.02%	63.08%	33.64%	One who can read a newspaper and write a simple letter in any language	Age 10 and above
2021	62.8%	73.4%	51.9%	77.3%	54%	"Ability to read and understand simple text in any language from a newspaper or magazine, write a simple letter, and perform a basic mathematical calculation (i.e., counting and addition/subtraction)."	Age 10 and above

Chapter 3

3 Essay 3: Assessment and Implications of Language Diversity and its Impact on Economic Productivity in Pakistan

Abstract

Essay 3 investigated that economic considerations become more significant in the presence of linguistic diversity, which impacts economic output. Economic concerns are relevant in the relationship between linguistic diversity and economic productivity because language is essential for elucidating certain economic functions. Using PSLM district-level data, current research employed a two-stage least square (2SLS) model to examine the correlation between language diversity and economic productivity, incorporating various linguistic diversity indexes into the econometric models. In conclusion, language diversity can promote economic productivity in the presence of primary education. However, the impact of language diversity on economic productivity is significantly higher in the presence of higher education. However, individuals with native language skills can significantly contribute to economic output. Implementing bilingual education programs incorporating the mother and national languages in educational settings may increase economic productivity through skills acquisition. In addition, policy experts might incorporate the creation of jobs requiring proficiency in local languages, which may involve supporting local skilled workers.

Keywords: Language Diversity; Mother Language; Economic Productivity; Language Groups

3.1 Introduction and Research Background

Language is indispensable for the functioning of economies, as it has the potential to influence the direction of economic development (Bove & Elia, 2017; Fearon, 2003b; Gurevich et al., 2021). Similarly, the language of instruction in education is vital for the socioeconomic progress of nations, providing substantial benefits to both individuals and the economy as a whole (Fearon, 2003b; Guiso et al., 2006; Lang, 1986; Lohmann, 2011). Furthermore, economic considerations become increasingly important in contexts of

"language diversity," which can influence economic productivity[4] (Alesina & Giuliano, 2015; Moreno-Fernández & Otero, 2008; Spolaore & Wacziarg, 2009).

Language is a prerequisite for the socioeconomic development of a society; instead of just considering it only a medium of instruction and communication, it benefits the individuals and the economy. Moreover, as a means of communication, language can shape and transmit the values, beliefs, and customs in our lives and remain the identity of individuals (Alesina & Reich, 2015). Without language, economies could not exist (Fearon, 2003b; Fearon & Laitin, 2003). The economic concerns are relevant here regarding how linguistic issues are associated with economic reasoning, and language is considered critical in explaining certain economic functions (Lang, 1986). In addition, sustainable development promotes mother language education that enhances skills, learning, values, and attitudes to build more sustainable economies (UN, 2015; UNESCO, 2017).

The increasing focus on communication skills has led to the concept of "Language Capital," viewed as a component of human capital inherent in individuals. Language capital refers to the ability to speak, write, and read in one or more languages, and it is developed as a child grows and gains fluency in their "mother language" (Chiswick, 1991). Linguistic diversity presents both advantages and disadvantages for the economy. On the one hand, language diversity can enhance productivity by positively influencing education and facilitating better communication. On the other hand, it is often associated with ethnically targeted and suboptimal policies and inefficient resource allocation, which can hinder economic efficiency.

The importance of linguistic diversity is growing, and numerous researchers have contributed to economic literature by exploring how income levels among countries correlate with linguistic diversity and economic growth (Easterly & Levine, 1997; Karnane & Quinn, 2019; Lee, 2018). Individuals tend to achieve higher economic gains when they receive education in a fluent language, as this knowledge enhances their ability to earn higher incomes in the labor market (Chiswick, 1991; Dustmann & Fabbri, 2003). The overall welfare of an

[4] Ginsburgh and Weber (2020), Gazzola and Wickström (2016), Ginsburgh et al. (2016) describing the impacts of language on varied economic outcomes and public policies.

economy can be improved by increasing individuals' 'capabilities[5] and 'freedom[6] to fully utilize their linguistic skills and potential (Drèze & Sen, 2002).

Linguistic diversity is widely recognized as a valuable economic resource that can positively influence economic growth. Research indicates that institutions play a critical role in shaping the relationship between linguistic diversity and economic outcomes by moderating interactions among diverse language groups. Effective institutions can help mitigate the potential negative impacts of diversity, such as conflict and communication barriers, thereby enhancing economic growth (Mickiewicz et al., 2019; Ottaviano & Peri, 2006). Empirical studies also support the positive impact of language diversity on business productivity. While increased diversity can lead to conflicts and communication issues, these challenges are often outweighed when effectively managed, resulting in higher productivity. For example, companies with highly diverse racial and cultural boards are 43 percent more likely to achieve greater profits (Alesina & Ferrara, 2005). Moreover, cultural diversity fosters creativity and innovation, as evidenced in Germany, where diverse cultural backgrounds contribute to the growth of technology-driven startups. Ethnic pluralism is positively associated with entrepreneurship, which drives economic innovation and expansion, demonstrating the broader economic benefits of a diverse society.

A substantial body of literature highlights the correlation between linguistic diversity and economic outcomes, such as growth and development. However, linguistic diversity can also lead to exclusion, exacerbating societal structural instability. This dual effect underscores the complex relationship between linguistic diversity and economic performance, where diversity can foster growth and development under inclusive conditions. Still, it may also contribute to social and economic disparities if not effectively managed.

[5] It is referred as ultimate combinations of functioning's from which a person can choose (Dreze & Sen 2002).

[6] It is referred as "the range of options a person has in deciding what kind of life to lead (Dreze & Sen 2002).

3.1.1 Significance, Research Gap, and Literature Contributions

This subject holds significant economic relevance, especially in the context of Pakistan. The exploration of the relationship between linguistic divisions[7] and economic performance is particularly significant due to the evident linguistic divisions observed in the country. The diverse linguistic landscape in Pakistan has motivated research into how these divisions might influence economic outcomes, highlighting the need to understand the economic implications of language diversity within Pakistan's socio-economic framework (Alesina & Ferrara, 2005). Linguistic issues are linked to economic outcomes, particularly regarding resource allocation among competing sectors. Language diversity can influence how resources are distributed, potentially affecting the efficiency and equity of economic policies and investments (Alesina & Ferrara, 2005; Alesina & Spolaore, 1997; Easterly & Levine, 1997; Eifert et al., 2010). When linguistic groups compete for resources, it can lead to disparities in allocation, impacting sectors such as education, healthcare, and infrastructure. Understanding these dynamics is fundamental for developing inclusive policies that ensure fair resource distribution across all linguistic communities (Chiswick, 1988).

Given its ethnolinguistic background, Pakistan, with its four provinces, is far from a homogenous society. It is a nation characterized by significant ethnic, linguistic, political, and cultural diversity. The linguistic landscape of Pakistan is particularly complex, as each province hosts more than one dominant spoken language alongside several minority languages. This linguistic heterogeneity plays a crucial role in shaping economic decision-making in the public sphere, influencing policies, resource allocation, and the country's overall governance. The diverse linguistic formation requires careful consideration in public administration to ensure equitable representation and economic opportunities for all linguistic groups (Collier, 2001; Hjort, 2014b) in linguistically fragmented societies (Alesina & Ferrara, 2005; Alesina & Spolaore, 1997; Easterly & Levine, 1997; Eifert et al., 2010). However, an additional consideration in a multilingual, heterogeneous society involves addressing language policy

[7] There are more than 80 spoken languages in Pakistan, whereas the six most spoken languages are spoken by 95.44% of the population of which Urdu is for 7.57%, 44.15 are Punjabi speakers, 14.1% are Sindhi speaking, and 15.44% 3.57%, 3.57%, and 10.53% are Pashto, Balochi, and Saraiki speakers respectively (Population Census, 2017).

questions (Gershman & Rivera, 2018). In such a context, the linguistic environment is crucial for understanding Pakistan's economic productivity determinants. Given the country's linguistic diversity, language policies can significantly impact economic outcomes, influencing factors such as labor market dynamics, education, and social integration. Therefore, examining the linguistic environment is essential for comprehensively assessing Pakistan's economic productivity and development strategies.

Empirical evidence highlights the role of language diversity in shaping economic productivity internationally and across various countries. However, this question remains underexplored in the context of Pakistan. A literature review reveals a lack of studies investigating the empirical association between language diversity and economic productivity in Pakistan. Consequently, the economic significance of linguistic diversity has largely been overlooked in the Pakistani context. This research aims to fill this gap by empirically investigating the relationship between language diversity and economic productivity in Pakistan. By doing so, it seeks to address a significant gap in the literature and emphasize the importance of considering language heterogeneity when analyzing economic outcomes, which is widely recognized in international studies.

3.2 Research Objective

1. Based on the theoretical contemplations, to bring empirical evidence on the relationship between language diversity and economic productivity at various levels of education, i.e., primary, secondary, and higher at the district level in Pakistan.

3.3 Research Hypothesis

This section aims to empirically examine the relationship between language diversity and economic productivity across different educational levels in Pakistan. This hypothesis is constructed to explore whether language diversity influences economic productivity in Pakistan.

Null Hypothesis 1 (H_0): Language diversity has a significant impact on economic productivity at various levels of education (primary, secondary, and higher) at the district level in Pakistan.

Alternative Hypothesis 1 (H_A): Language diversity does not significantly impact economic productivity at various levels of education (primary, secondary, and higher) at the district level in Pakistan.

Hypothesis 1A:

H_0: Language diversity does not significantly impact economic productivity at the primary education level in Pakistan.

H_A: Language diversity has a significant impact on economic productivity at the primary education level in Pakistan.

Hypothesis 1B:

H_0: Language diversity does not significantly impact economic productivity at the secondary education level in Pakistan.

H_A: Language diversity has a significant impact on economic productivity at the secondary education level in Pakistan.

Hypothesis 1C:

H_0: Language diversity does not significantly impact economic productivity at the higher education level in Pakistan.

H_A: Language diversity has a significant impact on economic productivity at the secondary education level in Pakistan.

By analyzing its impact at the primary, secondary, and higher education levels, this study seeks to uncover how linguistic variations influence economic performance at the district level. Understanding this relationship will provide valuable insights for policymakers to address both educational and economic disparities in a linguistically diverse society like Pakistan.

3.4 Theoretical and Empirical Literature Review

Extensive literature is available regarding the impact of linguistic diversity on economic productivity. The present study investigates the view that attaining knowledge can potentially lead to economic benefits, conditional upon the capability of education received (Coombs, 1985). Economic theory endeavors to illustrate the consistencies in human interactions and their economic outcomes; thus, language describes the behavior of certain economic functions (Lang, 1986), i.e., economic productivity (Montalvo & Reynal-Querol, 2005; Persson & Tabellini, 1992) and optimization of income (Ball, 2010; Chiswick, 1988, 1991; Dale-Olsen & Finseraas, 2020). The foundation of the concept is rooted in (Marschak, 1965) and established the significance of incorporating linguistic environment in economics that determines economic activity.

3.4.1 Linguistic Diversity and Economic Productivity

The world is diverse and highlights similarities and differences in the findings that shed some light on the question, for instance, how different attitudes toward different languages spoken and used in education play a significant role in economic productivity. There is a growing body of literature on the relationship between linguistic diversity, ethnic diversity, and economic growth. Mauro (1995) explained that a high level of ethnolinguistic diversity implies a lower level of investment. Easterly and Levine (1997) showed that ethnic diversity negatively affects economic growth. Investigating how linguistic diversity affects economic performance has recently become an active research area, especially in economics (Alesina & Ferrara, 2005; Gören, 2014; Horwitz & Wakefield, 2007; Posner et al., 2004). Furthermore, (Clemens et al., 2014) also investigate how cultural diversity affects economic growth. There is ample evidence that suggests that ethnic diversity influences an individual's productivity and, hence, economic growth (Easterly & Levine, 1997). Linguistic heterogeneity significantly influences economic decision-making in the public sphere (Hjort, 2014b). It involves the lower provision of public goods (Collier, 2009) in ethnically fragmented societies (Alesina & Ferrara, 2005; Alesina & Spolaore, 1997; Easterly & Levine, 1997; Eifert et al., 2010). Individuals facing language diversity complement each other in production, but it is also likely that individuals with no language diversity collaborate more effectively (Lang, 1986; Lazear, 1999).

There has been increasing interest in the economic consequences of linguistic heterogeneity in recent years, which eventually generates various long-lasting economic effects (Montalvo & Reynal-Querol, 2005; Montalvo & Reynal-Querol, 2014). Economic activities and language communication are closely related, and it is indispensable to consider that language diversity provides the basis for economic and human development (Laitin & Ramachandran, 2016). From an economic point of view, the role of linguistic heterogeneity can be determined by how language communication, while a significant prerequisite, facilitates economic development. Language is not an end, but it serves as a means for economic development (Anand & Sen, 2000; Desmet et al., 2016; Hanushek & Wößmann, 2007). The relationship between economics and language is primarily rooted in "how individuals acquire knowledge in certain languages." Languages are human's non-quantifiable resources that individuals can invest in to enhance productivity (Akujobi, 2019). Therefore, the choice of language comes with varying access to economic opportunities and determines the socioeconomic status of the individuals (Alesina et al., 2000; Laitin & Ramachandran, 2015).

EASTERLY (1999) argued that conflict of preferences in language choice is suboptimal from an economic point of view, while Alesina and Ferrara (2005) described that ethnic mix brings about variety in productivity, abilities, and experiences, which may be more productive. According to (Hardach, 2018), language matters, and language heterogeneity is linked with economic growth at the individual and national levels. Using the micro-level data, Laitin and Ramachandran (2015) explored a significant negative relationship between economic outcomes and official languages that are distant from the local Indigenous languages. (Laitin & Ramachandran, 2015; Mweri, 2020; Ramachandran, 2012) focused on providing mother-language instruction in the early grades that further helps to increase efficiency in later years of age. Alesina and Ferrara (2005) concluded that the augmenting productivity effect of diversity is only significant at higher stages of economic growth. Ratna et al. (2012) used state-level data from the United States and Canada and concluded the inverse impact of diversity on national per capita GDP. Jain (2011) analyzed the impact of language on economic performance by using the district-level data of Indian states on linguistic lines to estimate the impact of speaking the majority language on educational and occupational outcomes. The researcher found that districts that spoke the majority language of the state

during colonial times enjoyed persistent economic benefits, while after reorganization, the minority language districts experienced greater growth.

In contrast, in recent economic literature, linguistic diversity is viewed as an economic resource that positively affects economic growth. This relationship also appears in the strong positive association between language diversity and innovation in education (Flew, 2010; Peck, 2011). Several studies indicate that institutions that moderate relations between diverse language groups are essential in determining whether the relationship between diversity and economic growth is positive or negative. Easterly (2001) concludes that 'good' institutions substantially mitigate the adverse effects of diversity. According to (Rodríguez-Pose & von Berlepsch, 2019), counties with a more diverse population composition 130 years ago are significantly more prosperous today.

Sun et al. (2019) discovered that in China, cultural diversity significantly encourages the formation of new private firms, particularly in the manufacturing industry and among small businesses. Additionally, ethnic pluralism has a strong positive correlation with entrepreneurship, which drives economic innovation and expansion. Using UK data from 2003 to 2013, (Mickiewicz et al., 2019) argued that ethnic pluralism as a characteristic of a locale with multiple ethnic groups is most conducive to entrepreneurship. Ottaviano and Peri (2006) discovered that culturally diverse cities have higher house rents. Kemeny (2012) discovered that diversity positively affects wage and salary income.

There is abundant empirical evidence that language diversity increases the productivity of businesses (Hartenian & Gudmundson, 2000). Alesina and Ferrara (2005) highlighted 32 projects demonstrating an increase in diversity leads to an increase in conflict and a decrease in communication, as well as an increase in productivity when communication issues are managed. Hunt et al. (2018) examined that companies with the most racially and culturally diverse boards are 43 percent more likely to experience higher profits. Bantel and Jackson (1989) argued that increased cultural diversity within a group stimulates creativity and innovation.

3.4.2 Language Diversity and Regional Growth

Unlike the mixed economic consequences of diversity at an aggregate or national level, the link between urban clusters and diversity is frequently viewed as overwhelmingly positive. Beginning with Marshall and Marshall (1920), the economics literature has highlighted that labor market externalities generated by localization and cities result from skill concentrations and employment diversity. Subsequent literature on economic geography has focused on human capital externalities in urban growth centers created via complementarity in skills, knowledge sets, and abilities (Glaeser et al., 1992; Jacobs, 1992). In the urban economics literature, cities are considered diverse in terms of types of capital and demographic characteristics, irrespective of a country's economic development stages. Consequently, cities, relative to towns, villages, or rural areas, provide more significant opportunities for knowledge spillover and innovation that, in turn, can promote economic growth. Niebuhr (2010) evaluated the impact of cultural diversity on innovation in different regions in Germany using employment data instead of population data to measure three diversity indices: Herfindahl, Theil, and Krugman. Based on an extensive set of robustness checks, it concluded that the productivity effect of cultural diversity outweighs the negative effect of transaction costs. Cheng and Li (2012) defined cultural diversity as a linguistic fractionalization index and estimated its impact on wages and employment density (Bellini et al., 2013). Notwithstanding this rich body of work, as far as this literature has searched, there has been no test of the impact of language diversity at the city/district level in Pakistan, where people cannot communicate in a mutually comprehensible language.

3.5 Data Sources and Methodology

3.5.1 Data Sources

To provide empirical evidence on the role of language diversity in determining educational outcomes, data from the District Census Reports (2017) published by the Pakistan Bureau of Statistics (PBS) were collected and cross-referenced with Ethnologue Languages of the World. Educational outcomes were obtained from the PSLM (2019/20) and cross-verified with the World Inequality Database on Education (2019) and the Annual School Census 2017-18 Report at the district level. Additionally, other socioeconomic variables were measured using data from the PSLM (2019/20) and Multiple Indicator Cluster Surveys (MICS) (2019).

Table 3-1: Data Sources and Variables of the Study

Variable	Abb.	Definition	Used in literature	source	Source link
Herfindahl Diversity index	HLCI	The probability that two randomly selected individuals from the population belong to similar language groups	(Alesina et al., 2003; Easterly & Levine, 1997) (Easterly et al., 1997; Easterly & Levine, 1997) (Alesina et al., 1999; Alesina & Ferrara, 2005) (Dale-Olsen & Finseraas, 2020)	Pakistan population census 2017	https://www.pbs.gov.pk/content/final-results-census-2017
Language Diversity index	LDI	The probability that two randomly selected individuals from the population belong to different language groups.	(Alesina et al., 2003) (Easterly et al., 1997; Easterly & Levine, 1997) (Alesina et al., 1999; Alesina & Ferrara, 2005) (Dale-Olsen & Finseraas, 2020)	Pakistan population census 2017	https://www.pbs.gov.pk/content/final-results-census-2017
Primary Education Enrolment	EEP	Number of students enrolled in Primary Education from grades 1 to 5, where children are admitted to schools at 5 and over.	(Hou, 2022) (Easterly & Levine, 1997)	PSLM 2019/20	https://www.pbs.gov.pk/content/pslm-district-level-survey-2019-20-microdata
				Pakistan Education Statistics 2017/2018	http://library.aepam.edu.pk/Books/PakistanF20Education%20Statistics%202017-18.pdf
Secondary Education Enrolment	EES	Number of students enrolled in Secondary Education, (1) middle-level education 6 to 8 grades (2) secondary-level 9 to 10 grades (3) the higher secondary education of grades 11 to 12	(Hou, 2022) (Easterly & Levine, 1997)	PSLM 2019/20	https://www.pbs.gov.pk/content/pslm-district-level-survey-2019-20-microdata
				Pakistan Education Statistics 2017/2018	http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202017-18.pdf

Higher Education Enrolment	EEH	Number of students enrolled in universities and post-graduate institutes, which include BA/BSc, BS, MS/MPhil, and PhD level.	(Hou, 2022) (Easterly & Levine, 1997)	PSLM 2019/20	https://www.pbs.gov.pk/content/pslm-district-level-survey-2019-20-microdata
				Pakistan Education Statistics 2017/2018	http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202017-18.pdf
Log of educational expenditures on education per student	LEEX	Expenditures per student based on annual an estimation as a ratio to total income earned a year	(Fiala & Delamonica, 2022; Rajkumar & Swaroop, 2008) (McMahon, 2000)	PSLM 2019/20	https://www.pbs.gov.pk/content/pslm-district-level-survey-2019-20-microdata
Ethnic discrimination	EDISC	Percentage of women and men aged 15-49 years having personally felt discriminated against or harassed within the previous 12 months based on a ground of discrimination prohibited under international human rights law.	(Jones et al., 1999) (Hjort, 2014a) (Jones et al., 1999) (Bove & Elia, 2017)	MICS various Issues	https://microdata.worldbank.org/index.php/catalog/4181
Multidimensional Poverty Index	MPI	The proportion of men, women and children of all ages living in poverty, by selected multidimensional poverty measures which complements household level consumption-based poverty measures by reflecting deprivations in other dimensions such as education, health, and standard of living.	(Brown & James, 2020; Heltberg et al., 2003; Naveed & Sutoris, 2020)	MICS various Issues	https://microdata.worldbank.org/index.php/catalog/4181
VIND	VIND	Vulnerability to MPI as a proportion of men, women, and	(Demery & Gaddis, 2009)	MICS various Issues	https://microdata.worldbank.org/index.php/catalog/4181

		children of all ages living in poverty			
UPOP	UPOP	Percentage of the population living in urban areas of the district.	(Gören, 2014; Lipman, 2004; Munir et al., 2022)	Pakistan population census 2017	https://www.pbs.gov.pk/content/final-results-census-2017
Log of employment income	LNEY	Total yearly income earned by the household from different employment sources	(Bove & Elia, 2017)	MICS various Issues	https://www.pbs.gov.pk/content/pslm-district-level-survey-2019-20-microdata
Human development index	HDI	Human capital skills embodied in individuals	(Anand & Sen, 2000) (Ranis et al., 2000)	MICS various Issues	https://microdata.worldbank.org/index.php/catalog/4181
Average household size	AHS	The average household size, i.e., the mean number of persons per household.	(Duncan et al., 1994) (Hanushek & Woessmann, 2012)	Pakistan population census 2017	https://www.pbs.gov.pk/content/final-results-census-2017
Population growth rate	PGR	The crude birth rate is the number of live births per 1,000 households during the specified period.	(Barro & Lee, 1994) (Barro & Lee, 2013) (Bove & Elia, 2017)	Pakistan population census 2017	https://www.pbs.gov.pk/content/final-results-census-2017
Dummy Variable Province (Punjab, Sindh, KP, Baluchistan)	PP, PS, PK, PB	Dummy Variable	(Alesina et al., 2003; Easterly & Levine, 1997) (Alesina et al., 1999; Alesina & Ferrara, 2005)		

Note: Data is compiled for 124 districts of Pakistan.

3.5.2 Methodology

The empirical methodology used for the empirical estimations is the two-stage least square (2SLS) model. The empirical models based on 2SLS intended to check the association between language diversity and economic productivity. Furthermore, this study utilized two measures of linguistic diversity to incorporate different assumptions about language diversity to check, under various assumptions, how economic productivity responds to a change in language diversity as used by (Desmet et al., 2016; Greenberg, 1956; Montalvo & Reynal-Querol, 2014).

3.5.3 Theoretical Model Specification

The endogeneity arises when one of the explanatory variables correlates with the residuals (Lu et al. (2018). Equation (1) illustrates a conventional ordinary least squares (OLS) regression and highlights the possibility of endogeneity in implementing a standard OLS model.

$$y = \beta 0 + \beta 1x + \beta 2x2 + u$$

Equation 3-1

This model comprises several key components, including the dependent variable Yi, the constant term α, the coefficients β, the explanatory variable(s) xi, and the disturbance term (residuals) εi. (Bascle, 2008), suppose the assumptions of OLS are met, and the random disturbance in the relationship between the dependent variable and explanatory variables is similar across all values of the explanatory variables. In that case, OLS represents the optimal estimator. In econometrics, it can be posited that the error variance remains constant, indicating that the errors are also homoscedastic. The assumption of homoskedasticity holds significant importance in the context of ordinary least squares (OLS) analysis. Wooldridge (2006) explained that the standard OLS produces impartial estimations under such conditions if the residual term exhibits no correlation with the independent variable; hence, estimates will be biased otherwise. Failure to account for endogeneity using appropriate econometric methods can result in the identification of "spurious regression;" consequently, incorrect estimation challenges the interpretation and applicability of findings, apart from producing inaccurate estimates of the coefficients.

However, the literature identified three predominant causes of endogeneity: errors in variables, omitted variable bias, and simultaneity (Wooldridge (2010) and Zaefarian et al. (2017).

$$y = \beta 0 + \beta 1x + u$$

Equation 3-2

When there is a correlation between x2 and x1, the estimates obtained through OLS are inconsistent and biased. However, for reliable estimation, it is necessary to identify an instrumental variable (IV) that exhibits no correlation with the error term u, yet is correlated with the independent variable x1. An IV for x1 can be identified if it satisfies both criteria.

$$X1 = \pi 0 + \pi 1z + v$$

Equation 3-3

The occurrence of errors in variables, commonly referred to as "measurement error," and the exclusion of significant variables in the econometric model results in omitted variable bias Wooldridge (2010). Zaefarian et al. (2017) assert that excluding significant explanatory variables in an analysis may significantly impact the disturbance term, leading to endogeneity issues that are anticipated as an omitted variable in a regression model. Failure to incorporate relevant variables into the model results in anticipated variations from these variables being attributed to the error term of a regression model, thereby giving rise to endogeneity issues. Omitted variable bias may arise due to the absence of data availability regarding a significant explanatory variable, which can be aided by incorporating multiple control variables in the regression model (Germann, Ebbes, and Grewal (2015). Simultaneity bias is a phenomenon that occurs when the causal relationship between one or more explanatory variables is co-determined, and they simultaneously affect each other (Wooldridge (2006, 2010). Moreover, Ullah et al. (2018) have noted that dynamic endogeneity arises when its past values influence the present values of the dependent variable.

IVs are a frequently employed method for addressing endogeneity issues. Identifying a suitable and robust instrument may prove hard; however, it is essential to note that incorporating an inadequate instrument can negatively impact the efficacy of the selected econometric model (Anderson, 2022; Bettis et al., 2014). In social sciences, various alternative methodologies such as IVs, generalized method of moments (GMM), two-stage least squares (2SLS), and three-stage least squares (3SLS) have been extensively employed to address diverse forms of endogeneity concerns (Lu et al., 2018). Nevertheless, due to its rigorous underlying assumptions and the challenges associated with identifying appropriate IVs, the use of IVs remains limited. The estimation method based on independent variables continues to be widely utilized for cross-sectional datasets. The IV

method is valuable for addressing various forms of endogeneity, such as simultaneous equations bias, selection bias, measurement errors, and unobserved confounding effects. Despite their potential usefulness in addressing endogeneity concerns, IVS must be relevant, leading to consistent coefficients that resolve endogeneity issues (Arnold et al., 2016). IVs exhibit no correlation with the error term; however, they correlate with the endogenous variables that are not used as explanatory variables in first-stage regression (Murray, 2006; Zaefarian et al. (2017).

The 2SLS method is a widely employed IV estimation technique requiring substantial theoretical and empirical validation. Researchers are required to verify the existence of endogeneity utilizing various statistical tests. Moreover, it is required to evaluate endogenous variables considering the existing literature and theory. According to Rossi (2014), IV-based regression solely with lagged values as "instruments" is not recommended due to the lack of complete justification from an econometrics standpoint. Papies et al. (2017), the use of IV estimation is recommended by researchers when there is relevant theoretical evidence that provides sound reasons to believe that there exists a significant correlation between one or more regressors.

Identifying a reliable instrument is a crucial aspect of implementing an IV approach, particularly when facing constraints on the strength and validity of such instruments, which has posed a significant challenge, as evidenced by the works of (Lu et al., 2018). Using "invalid" instruments may result in inconsistent estimates, even without endogeneity bias. Invalid IVs cannot be considered a solution but can be regarded as a problem (Rossi, 2014). As a general principle, researchers may identify instrumental variables either exogenous to their unit of analysis but impacted by it (e.g., within the organizational context) or endogenous to the unit of analysis (e.g., lagged variables). Although selecting an instrument variable that lies outside the unit of analysis can enhance the likelihood of satisfying the homogeneity condition, it is improbable that such an instrumental variable can satisfy the relevance condition.

On the contrary, the probability of satisfying the exogeneity condition is considerably low when identifying an IV within the unit of analysis, even though it enhances the likelihood of fulfilling the relevance condition. The concept of "instrument relevance" is frequently employed to evaluate the impact of a relevant instrument (strong versus weak) on the outcomes, which examines the relevance of a selected instrument and

evaluates its effectiveness. A weak instrument correlates weakly with the endogenous variable. If there is no correlation between the instrument and the endogenous variable, the instrument, which refers to the selected independent variable, is deemed irrelevant (Semadeni et al., 2014).

Two-Stage Least Square and Small Sample Size

Maydeu-Olivares, Shi, and Rosseel (2019) examined the relationship between sample size and the average behavior of IV regression estimates. They found that the sample size does not influence the average behavior of these estimates. However, they observed that the impact of omitted variables on regression estimates is significantly improved as the sample size increases, as demonstrated by the simulated regression results. This study conducted various simulations with different sample sizes (N= 50, N=100, N= 500). The study's findings demonstrated the sensitivity of the misspecification bias concerning small sample sizes. Furthermore, it has been determined that for sample sizes of N = 500 or greater, a relative bias of less than 10%; however, acceptable bias levels are also observed for smaller sample sizes (N = 100). Nevertheless, at a sample size of N = 50, neither the IVR nor ML estimator can be considered dependable.

At sample sizes N = 50 and 100, the variability of the two-stage least squares (2SLS) estimator is observed to be smaller compared to the maximum likelihood (ML) estimator across all cases. For values of N less than 500, the coverage rates for 95% confidence intervals are acceptable for 74% of the conditions for maximum likelihood (ML) estimation and 75% for two-stage least squares (2SLS) estimation. Hence, it can be concluded that there are no significant disparities in the rates of coverage among various methods; nevertheless, both approaches exhibit higher coverage rates when applied to data that follows a normal distribution, in contrast to a non-normal distribution. Browne (1982) introduced a residual-based statistic, which was further developed by Asparouhov and Muthén (2010) and Satorra and Bentler (1994).

Moreover, the extent of 2SLS coverage is influenced by the first stage F statistic and the sample size. In all cases where the value of F exceeds the standardized threshold of 10, exhibit satisfactory convergence rates ranging from 93% to 97%. The rationale behind the computation of the first stage F statistic lies in its ability to integrate the effect size, which quantifies the magnitude of the relationship between regression variables and the sample size (N). The cutoff value of $F \geq 10$ is commonly used for small sample sizes,

specifically when the sample sizes are 50 and 100. The coverage rate of 2SLS (Two-Stage Least Squares) estimators for constructing 95% confidence intervals remains satisfactory, irrespective of the observed sample size and the first stage F statistic. In the context of parameter values, it has been observed that a sample size of 500 or a first-stage F statistic greater than 10 is deemed adequate; however, these two conditions are sufficient but not necessarily required (Maydeu-Olivares et al., 2018).

Model Specification: Contemplation Between Language Diversity and Economic Productivity

Language diversity affects economic outcomes (Alesina et al., 2003; Easterly & Levine, 1997; Gradstein & Justman, 2002; Ratna et al., 2017b; Ratna et al., 2009). Therefore, the first empirical model established the association between language diversity and economic productivity. At the same time, economic productivity is proxied by the Per-capita income (Alesina & Ferrara, 2005). This chapter specified 3 empirical models.

The specification of three models in this study provides a comprehensive analysis of the impact of language diversity on economic productivity and educational outcomes across different educational levels—primary, secondary, and higher education. Each model examines how language diversity, along with other control variables, affects economic productivity, as measured by the log of employment income (LNEY), while focusing on a specific level of educational enrollment. Model 1 focuses on primary education enrollment to understand the foundational effects of language diversity on economic productivity, recognizing that early education is crucial for skill development and future economic outcomes. Model 2 shifts the analysis to secondary education enrollment, where the interaction between language diversity and other socioeconomic factors may influence dropout rates and long-term economic prospects differently than in primary education. Model 3 examines higher education enrollment, where language proficiency becomes critical for mastering complex subjects and professional training, significantly affecting future earnings and productivity. By analyzing these three educational stages, the study captures the nuanced effects of language diversity, which provides targeted policy insights for each level, ensuring a robust understanding of how linguistic diversity influences economic outcomes.

Model 1 contemplated the impact of language diversity measured by HLCI on the economic productivity measured by Log of employment income (LNEY) and educational enrollment primary, which is the core independent variable.

Model 1:

$$LNEY = \alpha_0 + \alpha_1 EEP_i + \alpha_2 HLCI_i + \alpha_3 LEEX_i + \alpha_4 EDISC_i + \alpha_5 HLDI_{HDI_i} + \alpha_6 PGR_i + \alpha_7 VIND_i + \alpha_8 MPI_i + \alpha_9 UPOP_i + \alpha_{10} PP_i + \alpha_{11} PS_i + \alpha_{12} PB_i + \varepsilon_i$$

Equation 3-4

Model 2 replaced the primary education enrollment with secondary education enrolment (EES) while keeping the same control variables in the second specification. Hence, the following equation represents the second specification.

Model 2

$$LNEY = \beta_0 + \beta_1 EES_i + \beta_2 HLCI_i + \beta_3 LEEX_i + \beta_4 EDISC_i + \beta_5 HLDI_{HDI_i} + \beta_6 PGR_i + \beta_7 VIND_i + \beta_8 MPI_i + \beta_9 UPOP_i + \beta_{10} PP_i + \beta_{11} PS_i + \beta_{12} PB_i + e_i$$

Equation 3-5

The third model specifications replaced higher education enrollment with higher education enrollment. However, the rest of the control variables are the same as incorporated in the previous model.

Model 3

$$LNEY = \gamma_0 + \gamma_1 EEH_i + \gamma_2 HLCI_i + \gamma_3 LEEX_i + \gamma_4 EDISC_i + \gamma_5 HLDI_{HDI_i} + \gamma_6 PGR_i + \gamma_7 VIND_i + \gamma_8 MPI_i + \gamma_9 UPOP_i + \gamma_{10} PP_i + \gamma_{11} PS_i + \gamma_{12} PB_i + \mu_i$$

Equation 3-6

EEP represents education enrollment at the primary level, EES refers to education enrollment at the secondary level, and EEH denotes education enrollment at the higher level. HLCI stands for the Herfindahl Linguistic Concentration Index, which measures language diversity. LEEX is the log of educational expenditures, while EDISC indicates ethnic discrimination. LDI_HDI refers to the Human Development Index. PGR is the population growth rate at the district level, VIND represents vulnerability to poverty, and MPI is the multidimensional poverty index. UPOP indicates the urban population, and PP, PS, and PB are provincial dummy variables for Punjab, Sindh, and Baluchistan.

Additionally, this research has developed three more models using the LDI in place of HLCI further to explore the impact of language diversity on economic productivity. These models—labelled as Models 4, 5, and 6—use the same independent variables as the previous models while focusing on different educational levels: primary, secondary, and higher education. By replacing HLCI with LDI, these models aim to provide a more nuanced understanding of how different measures of language diversity influence economic productivity. This approach allows for comparing the effects of various language diversity indices while controlling for other socio-economic and demographic factors, ensuring consistency in the analysis.

3.6 Variables of the Research

3.6.1 Measurement of Language Diversity

Research at hand used different measures of Linguistic Diversity (Desmet et al., 2016; Greenberg, 1956; Montalvo & Reynal-Querol, 2005). This research collected district-level data in Pakistan o masur language diversity[8]. However, variables are measured at the district level, including language diversity, educational enrollment at primary, secondary, and higher levels of education, poverty index, and racial discrimination in Pakistan.

1) Herfindahl Linguistic Concentration Index

The first is the classical linguistic diversity index, also known as the Herfindahl index. It assesses the likelihood of two randomly selected individuals in the population belonging to distinct linguistic groups.

$$HLCI = \sum_i s_i^2 \qquad \textbf{Equation 3-7}$$

The Herfindahl concentration index can quantify how concentrated or dispersed language speakers are among different languages within a region or population. A higher HLCI value indicates less diversity, meaning a few languages dominate. A lower value suggests a more even distribution among languages.

[8] In essay 2, the theoretical foundations of language diversity are elaborated.

2) Linguistic Diversity Index (LDI)

Easterly and Levine (1997) used as a measure of fragmentation the probability that two randomly drawn individuals from the unit of observation belong to two different groups. The Diversity (fractionalization) index LDI captures the degree to which a society is split into distinct language groups.

$$LDI = 1\text{-}\sum_{k=1}^{k}(p)_{k}^{2} \qquad \textbf{Equation 3-8}$$

In the context of language diversity, a higher value of the LDI indicates greater language diversity, which measures the proportion of the population that speaks languages other than the dominant ones. A value closer to 1 signifies a more diverse linguistic landscape, with a smaller proportion of speakers concentrated in a few languages. In conclusion, the LFL index often emphasizes diversity rather than concentration; however, HLCI measures language speakers' concentration. LFL Index focuses on diversity and considers the number of categories and their relative proportions.

3.6.2 Instruments of the Research and Their Exogeneity

Identifying a reliable instrument is a crucial aspect of implementing an IV approach, particularly when facing constraints on the strength and validity of such instruments. As a general principle, researchers may identify instrumental variables either exogenous to their unit of analysis but impacted by it (e.g., within the organizational context) or endogenous to the unit of analysis (e.g., lagged variables). This analysis has used the lag of educational expenditures as the instrument to run the instrumental regression. Although selecting an instrument variable that lies outside the unit of analysis can enhance the likelihood of satisfying the homogeneity condition, it is improbable that such an instrumental variable can satisfy the relevance condition. On the contrary, the probability of satisfying the exogeneity condition is considerably high and enhances the likelihood of fulfilling the relevance condition.

The concept of "instrument relevance" is frequently employed to evaluate the impact of a relevant instrument (strong versus weak) on the outcomes, which examines the relevance of a selected instrument and evaluates its effectiveness. A weak instrument correlates weakly with the endogenous variable. If there is no correlation between the instrument and the endogenous variable, the instrument, which refers to the selected independent variable, is deemed irrelevant (Semadeni et al., 2014). The current has used

employment income per capita as an instrument for a log of education expenditures, which was identified as the endogenous variable in the model. This study has employed tests of endogeneity under the Ho: variables are exogenous, and Durbin and Wu-Hausman significant values evidenced that “estat endogenous” and “estat endog” for the endogeneity existence in the model and then for the specific endogenous variable. “estat endog” specifically tests the endogeneity of the endogenous variables in the regression model. It provides statistics such as the Durbin-Wu-Hausman statistic and its associated p-value to assess whether the endogenous variables are correlated with the error term. The null hypothesis was assessed to determine whether the endogenous variables are exogenous (unrelated to the error term). A small p-value suggests evidence of endogeneity. “estat endogenous” is used in the context of "endogeneity testing" rather than instrumental variable modelling. estat endogenous examines the endogeneity of all variables in the model, not just the endogenous ones. It is often used when you want to perform tests for endogeneity in a standard OLS (ordinary least squares) regression model or other regressions. This command helps identify endogeneity problems in any regression, not just IV models.

3.6.3 Results and Discussion

3.6.4 Results

Using the Two-Stage Least Squares (2SLS) estimation methodology, this study provides empirical evidence that language diversity offers statistically and economically significant benefits at the district level, as reflected in per capita income. Notably, to our knowledge, this research is the first to investigate the impact of language diversity at the district level in Pakistan. The findings demonstrate that the recognition of language diversity enhances the positive economic effects of language diversity. The results suggest linguistic diversity yields economic advantages by facilitating interactions among individuals with varied knowledge and experiences. Furthermore, the evidence indicates that language instruction in education has effectively enabled individuals to acquire knowledge and integrate into linguistically diverse environments, thereby enhancing group cohesion and overall economic productivity. Table 3-2 presents the results of the 2SLS regression estimates examining the relationship between language diversity and economic productivity in Pakistan, using two potential language diversity variables, the HLCI and LDI in six different specified models.

Table 3-2: Two Stage Least Square Regression Estimates of Language Diversity (HLCI) and Economic Productivity

Variables	Model 1	Model 2	Model 3
EEP	0.000356**		
	(0.000171)		
EES		0.000296***	
		(0.000111)	
EEH			0.000979**
			(0.000447)
HLCI	-0.721*	-0.283*	-0.458***
	(0.408)	(0.172)	(0.106)
LEEX	0.383***	1.258**	0.446***
	(0.112)	(0.503)	(0.110)
EDISC	-0.991***	-0.00256	0.000490
	(0.349)	(0.0119)	(0.0143)
HLCI _HDI	0.794**	1.259**	1.541**
	(0.400)	(0.503)	(0.652)
PGR	0.0448	0.0709	0.0802
	(0.0394)	(0.0463)	(0.0524)
VIND	-0.00870*	-0.00199	-0.000785
	(0.00524)	(0.00656)	(0.00761)
MPI	-0.00615**	-0.00290	0.000729
	(0.00255)	(0.00334)	(0.00454)
UPOP	0.00592**	0.00334	0.00312
	(0.00241)	(0.00309)	(0.00353)
PP	0.347***	0.446***	0.678***
	(0.128)	(0.110)	(0.129)
PS	0.341**	0.241	0.191
	(0.141)	(0.165)	(0.198)
PB	0.310*	-0.0656	-0.136
	(0.172)	(0.261)	(0.330)
Constant	8.982***	13.88***	15.24***
	(1.441)	(2.799)	(3.958)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Table 3-2 presents the impact of language diversity and educational enrollment on economic productivity in Pakistan, with the dependent variable being the employment income (LNEY). Model 1 focuses on the effect of EEP and shows a positive and statistically significant coefficient for EEP, which indicates that higher enrollment in primary education is associated with increased LNEY, concluding that primary education enhances economic productivity. However, the coefficient for the HLCI is negative and significant, implying that greater linguistic concentration negatively affects economic outcomes, potentially limiting the economic integration of diverse linguistic groups. Model 2 extends this analysis to EES; like Model 1, the coefficient for EES is positive and

significant, indicating that higher EES is positively associated with higher LNEY. The negative coefficient for HLCI remains significant in this model, reinforcing that linguistic concentration hinders economic productivity at the secondary education level. Model 3 investigates the impact of EEH on LNEY and shows a positive and significant coefficient for EEH, suggesting that higher education further boosts LNEY; however, the negative coefficient for HLCI becomes more evident in this model, emphasizing that the adverse effects of linguistic concentration on economic performance are powerful at the higher education level. The findings indicate that increasing educational enrollment at all levels—primary, secondary, and higher—positively influences LNEY. However, a higher degree of linguistic concentration consistently detracts from economic productivity across all models, suggesting that promoting linguistic diversity and enhancing educational enrollment could be significant for fostering economic productivity. These results align with Ratna et al. (2009), who found that regions with greater linguistic diversity tend to have higher average incomes and more robust economic outcomes, highlighting the benefits of fostering a linguistically diverse environment (Barro, 1998; Caraballo & Buitrago, 2019; Ratna et al., 2017b; Ratna et al., 2009; Ratna et al., 2014).

Error! Not a valid bookmark self-reference. shows the LDI estimates for economic productivity, as measured by the log of employment income (LNEY), in Models 4, 5, and 6. Model 4's EEP coefficient is statistically significant at the 10% level, implying that as linguistic diversity increases, so does economic productivity, as measured by the log of employment income (LNEY), when primary education enrollment is considered alongside LDI. This suggests that in contexts with a diverse linguistic environment, there may be increased economic productivity due to greater inclusivity and the leveraging of diverse linguistic skills in primary education settings. In Model 5, EES is also significant, indicating that increased language diversity is associated with higher economic productivity. The lower coefficient compared to Model 4 suggests a slightly weaker, but still positive, impact of linguistic diversity on economic outcomes at this level of education. Model 6 EEH, which is highly significant, has a strong positive and significant coefficient, implying that at higher education levels, linguistic diversity has a robust positive impact on economic productivity. This could be attributed to the increased levels of cognitive skills, creativity, and problem-solving abilities fostered by a diverse linguistic environment, particularly in higher education settings where diverse ideas and perspectives are actively encouraged and integrated. Across all three models, the positive coefficients

for the LDI consistently indicate that language diversity increases economic productivity as measured by employment income. The varying levels of significance and coefficient sizes suggest that this effect may vary slightly depending on education level, but the overall trend indicates that linguistic diversity has a positive impact on economic outcomes, which could reflect the importance of diverse linguistic skills and perspectives in fostering a more inclusive and dynamic economic environment (Caraballo & Buitrago, 2019; Cheng & Li, 2012; Ratna et al., 2017b; Ratna et al., 2009)

Table 3-3: Two Stage Least Square Regression Estimates of Language Diversity (LDI) And Economic Productivity

Variables	Model 4	Model 5	Model 6
EEP	0.000356**		
	(0.000171)		
EES		0.000296***	
		(0.000111)	
EEH			0.000824**
			(0.000374)
LDI	0.722*	0.283*	0.458***
	(0.407)	(0.171)	(0.106)
LEEX	0.383***	1.257**	0.442***
	(0.112)	(0.503)	(0.110)
EDISC	-0.992***	-0.00258	-0.00600
	(0.349)	(0.0119)	(0.0127)
LDI_HDI	0.794**	1.258**	1.219**
	(0.400)	(0.503)	(0.570)
PGR	0.0448	0.0709	0.0838*
	(0.0394)	(0.0463)	(0.0485)
VIND	-0.00870*	-0.00199	-0.00175
	(0.00524)	(0.00656)	(0.00683)
MPI	-0.00615**	-0.00290	0.00121
	(0.00255)	(0.00334)	(0.00404)
UPOP	0.00591**	0.00333	0.00392
	(0.00241)	(0.00308)	(0.00318)
PP	0.347***	0.446***	0.690***
	(0.128)	(0.110)	(0.121)
PS	0.341**	0.241	0.213
	(0.141)	(0.165)	(0.177)
PB	0.309*	-0.0655	-0.0649
	(0.172)	(0.261)	(0.284)
Constant	9.109***	14.04***	78.82
	(1.480)	(2.840)	(59.07)

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Source: Author's estimations using STATA 17.0

Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Table 3-2 presents the impact of language diversity and educational enrollment on economic productivity in Pakistan, with the dependent variable being the employment income (LNEY). Model 1 focuses on the effect of EEP and shows a positive and statistically significant coefficient for EEP, which indicates that higher enrollment in primary education is associated with increased LNEY, concluding that primary education enhances economic productivity. However, the coefficient for the HLCI is negative and significant, implying that greater linguistic concentration negatively affects economic outcomes, potentially limiting the economic integration of diverse linguistic groups. Model 2 extends this analysis to EES; like Model 1, the coefficient for EES is positive and significant, indicating that higher EES is positively associated with higher LNEY. The negative coefficient for HLCI remains significant in this model, reinforcing that linguistic concentration hinders economic productivity at the secondary education level. Model 3 investigates the impact of EEH on LNEY and shows a positive and significant coefficient for EEH, suggesting that higher education further boosts LNEY; however, the negative coefficient for HLCI becomes more evident in this model, emphasizing that the adverse effects of linguistic concentration on economic performance are powerful at the higher education level. The findings indicate that increasing educational enrollment at all levels—primary, secondary, and higher—positively influences LNEY. However, a higher degree of linguistic concentration consistently detracts from economic productivity across all models, suggesting that promoting linguistic diversity and enhancing educational enrollment could be significant for fostering economic productivity. These results align with Ratna et al. (2009), who found that regions with greater linguistic diversity tend to have higher average incomes and more robust economic outcomes, highlighting the benefits of fostering a linguistically diverse environment (Barro, 1998; Caraballo & Buitrago, 2019; Ratna et al., 2017b; Ratna et al., 2009; Ratna et al., 2014).

Error! Not a valid bookmark self-reference. shows the LDI estimates for economic productivity, as measured by the log of employment income (LNEY), in Models 4, 5, and 6. Model 4's EEP coefficient is statistically significant at the 10% level, implying that as linguistic diversity increases, so does economic productivity, as measured by the log of employment income (LNEY), when primary education enrollment is considered alongside LDI. This suggests that in contexts with a diverse linguistic environment, there may be increased economic productivity due to greater inclusivity and the leveraging of diverse linguistic skills in primary education settings. In Model 5, EES is also significant,

indicating that increased language diversity is associated with higher economic productivity. The lower coefficient compared to Model 4 suggests a slightly weaker, but still positive, impact of linguistic diversity on economic outcomes at this level of education. Model 6 EEH, which is highly significant, has a strong positive and significant coefficient, implying that at higher education levels, linguistic diversity has a robust positive impact on economic productivity. This could be attributed to the increased levels of cognitive skills, creativity, and problem-solving abilities fostered by a diverse linguistic environment, particularly in higher education settings where diverse ideas and perspectives are actively encouraged and integrated. Across all three models, the positive coefficients for the LDI consistently indicate that language diversity increases economic productivity as measured by employment income. The varying levels of significance and coefficient sizes suggest that this effect may vary slightly depending on education level, but the overall trend indicates that linguistic diversity has a positive impact on economic outcomes, which could reflect the importance of diverse linguistic skills and perspectives in fostering a more inclusive and dynamic economic environment (Caraballo & Buitrago, 2019; Cheng & Li, 2012; Ratna et al., 2017b; Ratna et al., 2009)

Table 3-3 shows that the coefficient for LEEX is positive and statistically significant across all models, indicating that an increase in LEEX is associated with a higher LNEY, as a 1% increase in LEEX is associated with a 0.383% increase in LNEY in Model 1, 1.257% in Model 2, and 0.442% in Model 3, implying that LEEX consistently boosts employment income, with a greater impact in Model 2. EDISC (ethnic discrimination) is negative and significant in Models 1 and 3, indicating that higher educational disparities are associated with lower productivity (LNEY). In Model 1, every one-unit increase in educational disparity results in a 0.992% decrease in employment income. At the same time, in Model 3, the effect is much smaller but still negative, demonstrating that educational disparities can have a negative impact on LNEY.

LDI_HDI is positive and significant in Models 2 and 3, indicating that LDI_HDI is associated with higher LNEY, as a 1% increase in LDI_HDI corresponds to a 1.258% increase in LNEY in Model 2 and 1.219% in Model 3, implying that improvements in human development in the context of language diversity in the workforce resulted in better employment income outcomes. PGR (Population Growth Rate) is positive but not statistically significant in all models, indicating no strong evidence that the population growth rate directly affects employment income in this study. In Model 1, VIND

(Vulnerability Index) is negative and statistically significant at the 10% level, implying that an increase in vulnerability is associated with decreased economic productivity, as each unit increase in the vulnerability index results in a 0.87% decrease in employment income. The effects in Models 2 and 3 are not statistically significant, implying that this variable does not consistently influence employment income across model specifications. MPI (Multidimensional Poverty Index) has a negative and statistically significant coefficient in Model 1, indicating that higher multidimensional poverty levels are associated with lower employment income. A one-unit increase in MPI results in a 0.615 percent decrease in employment income. The effect is insignificant in Models 2 and 3, indicating that the relationship is inconsistent across model specifications. UPOP (Urban Population) is positive and significant at the 5% level in Model 1, implying that a higher proportion of the urban population is associated with higher employment income. A one-unit increase in urban population percentage results in a 0.591% increase in employment income in Model 1, but the effects are not statistically significant in Models 2 and 3.

The PP (0.347) coefficient in Model 1 is positive and statistically significant at the 1% level, indicating that Punjab residents have a higher LNEY than those in the base category, Khyber Pakhtunkhwa (PK). Punjab has 34.7% higher economic productivity than Khyber Pakhtunkhwa, assuming all other factors remain constant. In Model 2, the coefficient for PP (0.446) is also positive and significant at the 1% level, implying that Punjab has a 44.6% relative income advantage over Khyber Pakhtunkhwa under this model specification. In Model 3, the coefficient for PP (0.690) remains positive and significant at the 1% level, indicating that individuals in Punjab have 69.0% higher LNEY than those in Khyber Pakhtunkhwa, demonstrating a consistent and strong positive effect of being in Punjab on LNEY across all models. The coefficient for PB (0.309) in Model 1 is positive and statistically significant at the 1% level, implying that individuals in Baluchistan have, on average, a 30.9% higher LNEY than those in Khyber Pakhtunkhwa, implying that living in Baluchistan is associated with a higher LNEY. However, in Model 2, the coefficient for PB (-0.0655) is negative but not statistically significant, indicating that the effect of being in Baluchistan on LNEY when compared to Khyber Pakhtunkhwa is negligible or not different from zero in this model specification. In Model 3, the coefficient for PB (-0.0649) is also negative and non-significant, supporting the notion that when other variables are included or accounted for in the model, the employment income difference between Baluchistan and Khyber Pakhtunkhwa is not statistically significant. The coefficient for PS

(0.341) in Model 1 is positive and statistically significant at the 1% level, indicating that individuals in Sindh have, on average, a 34.1% higher LNEY than those in Khyber Pakhtunkhwa, implying that, like Punjab, residing in Sindh is associated with a higher LNEY relative to Khyber Pakhtunkhwa. In Model 2, the coefficient for PS (0.241) is positive but not statistically significant, indicating that while there may be a positive association between living in Sindh and LNEY, it is insufficient to be considered statistically significant in this model. In Model 3, the PS coefficient (0.284) remains positive. Nonetheless, it is not statistically significant, indicating that the income disparity between Sindh and Khyber Pakhtunkhwa is not statistically significant when other variables are considered.

After controlling for other factors, the results suggest that an entirely linguistically heterogeneous city would have a higher average income than a completely linguistically homogeneous city. In general, it appears that developing nations are the ones who benefit from diversity, possibly because they are further from the technological frontier. For instance, labor inputs are used in various ways at different stages of technological development. Far from the technological frontier, imitating technologies is the main engine of total factor productivity growth (Vandenbussche et al., 2006). Moreover, this study also found that language diversity increases the per capita income at the district level in Pakistan, which is also supported by empirical evidence (Cheng & Li, 2012; Glaeser et al., 1992; Hjort, 2014a; Horvath & Huber, 2019; Jones et al., 1999; Ratna et al., 2017b; Ratna et al., 2014; Schild & Wrede, 2015). The findings on the impacts of language diversity are also based on micro-macro contradictions – where micro-level studies (city and firm level) mainly show positive impacts and most macro-level (country or cross-country) studies show negative impacts. For instance, Shaban and Cadene (2023) and Shaban and Khan (2022) found that city-level studies mainly support the positive economic impact of language diversity cross-country studies generally do not support the same. Moreover, the interaction of HDI and language diversity has not been adequately investigated in the empirical literature, and their interactional impact on economic growth has remained unexplored. In this context, our research examined the impact of HLCI _HDI and LDI_HDI on income per capita at the district levels in Pakistan. The context of Pakistan empirically and theoretically becomes significant as it is a linguistically highly diverse country.

3.6.5 Discussion

This research investigated those correlations between linguistic diversity and per capita are significant and positively associated, which are imperative to investigate in the case of Pakistan. The country is renowned for its extensive linguistic diversity, encompassing over 86 distinct languages. Urdu is the nation's official language, whereas regional languages such as Punjabi, Sindhi, Pashto, Balochi, and others are extensively utilized in diverse localities. The presence of diverse languages within a given population contributes significantly to various language groups' cultural identity and heritage. Economic productivity is a fundamental metric for assessing a nation's economic progress and quality of life, influenced by factors such as educational attainment in the mother language, employment opportunities, ethnic discrimination, and skills.

Effective communication is fundamental to the group process; however, this research does not support the Pakistan policy of “one language, one nation,” which means that utilizing English, which is the non-indigenous language but the official language in Pakistan, has been found to hinder development and contribute to social distance (Welch & Welch, 2008). Tsui and Tollefson (2004) demonstrated that language diversity is essential to recognize; however, an individual speaking the mother language can contribute to economic productivity. However, lingua franca is essential to learn; however, it might gradually be incorporated into the learning process. This analysis is at district levels in Pakistan, thus suggesting that the mother language can contribute to higher economic outcomes, as evidenced by the findings of Chapter 2, because interacting in a language one is not proficient enough facilitated by social distances, negatively impacting positive socioeconomic attitudes.

Consequently, working opportunities that share an individual’s linguistic background offer greater communication ease and a reduced possibility of misinterpretation. The absence of socio-linguistic knowledge can lead to unintentional socio-cultural misinterpretation, resulting in relationship conflicts among groups. The underlying reason for the conclusion is what was concluded (Sears, 1981) that an individual's attitude is primarily shaped during childhood learning and altering these attitudes can be challenging (Green & Seher, 2003; Sears & Funk, 1999).

Moreover, the research results imply an indirect channel, which is the presence of linguistic obstacles in educational institutions, which, in turn, perhaps does not allow

individuals to receive high-quality and practical instruction in their native language and has the potential to impede academic achievements. The restricted access to educational resources and lower academic achievements can harm an individual's income. Hence, linguistic obstacles impact economic engagement and job prospects (Brock-Utne, 2001b; Graham, 2010; Kumari; Mufwene, 2010; Ratna et al., 2017a). Individuals who lack proficiency in the predominant language of a given region may encounter difficulties in accessing employment opportunities, particularly in metropolitan areas. This phenomenon may result in restricted employment opportunities and decreased income levels. Although the direct correlation between language diversity and economic productivity in Pakistan has not been extensively researched, current literature suggests that language may significantly impact educational inequalities, affecting economic engagement, regional disparities, and market accessibility.

3.7 Conclusion and Policy Recommendation

Economic considerations gain greater significance in the presence of "linguistic diversity," shaping economic output. Language acquisition and utilization are fundamental for advancing a society's socioeconomic status. Economic concerns are relevant in the association between linguistic diversity and economic productivity, where language is deemed crucial in elucidating certain economic functions. Furthermore, the recognition of mother language education fosters the acquisition of competencies, knowledge, principles, and dispositions that determine national income.

The two-stage least square (2SLS) model investigated the relationship between language diversity and economic productivity in Pakistan using district-level cross-sectional data. This study employed two measures of linguistic diversity to examine how economic productivity responds to a change in language diversity under various assumptions. The regression analysis results provided valuable insights into the relationship between Pakistan's per capita output and variables such as language diversity, educational expenditures, primary education enrollment, LDI_HDI, population growth, and ethnic discrimination. The empirical evidence suggested a positive correlation between Pakistan's primary, secondary, and higher education and district-level economic output. This finding is consistent with the idea that human capital plays an essential role in driving economic productivity; however, the observation of language discrimination implied that

increased such discrimination is linked to decreased productivity (Ratna et al., 2017b; Ratna et al., 2009).

This research examined the correlations between Pakistan's linguistic diversity and per capita income. The coexistence of multiple languages in Pakistan, where English is the official language, has been identified as a factor that impedes progress and fosters social division; recognizing the significance of linguistic diversity is essential. Nonetheless, it is essential to acquire proficiency in a lingua franca; this, however, can be adapted through higher education. There is evidence that proficiency in one's mother language can improve economic outcomes, as communication in a language in which one is not proficient can create social distance and negatively impact positive socioeconomic attitudes. There may be enhanced economic opportunities in Pakistan's regions where a particular mother language is predominant, leading to a higher per capita income. In contrast, regions with language marginalization or limited linguistic prevalence may experience reduced economic growth and income levels.

Based on the findings, significant policy implications are proposed for inclusion in policy formulation. Recognizing language diversity increases income; therefore, implementing bilingual education programs that integrate the mother and national languages in educational settings may increase economic productivity through skill acquisition. Including the mother language in education may allow students to simultaneously develop strong fundamental competencies in their native language while acquiring proficiency in additional languages at an advanced level of instruction may foster higher productivity. In addition, policy experts should incorporate the creation of jobs requiring proficiency in local languages, which may involve supporting local skilled workers. In addition, it is essential to educate employers on the potential benefits of incorporating mother language proficiency and to promote the acceptance and integration of linguistic diversity in the workplace.

3.8 Study Limitations and Future Research Endeavors

This study is limited to analyzing data at the district level in Pakistan because of constraints related to data availability. By incorporating a Mother Language question into the PSLM survey, it would be possible to examine this phenomenon individually, thereby expanding our comprehension of economic outcomes among various linguistic communities.

3.9 References

Akujobi, O. S. (2019). Linguistic elitism and the conflict of ideologies: The African perspective. *PREORC Journal of Arts and Humanities, 4*(1), 61-85.

Alesina, A., Baqir, R., & Easterly, W. (1999). Public goods and ethnic divisions. *The quarterly journal of economics, 114*(4), 1243-1284.

Alesina, A., Baqir, R., & Easterly, W. (2000). Redistributive public employment. *Journal of Urban Economics, 48*(2), 219-241.

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth, 8*(2), 155-194.

Alesina, A., & Ferrara, E. L. (2005). Ethnic diversity and economic performance. *Journal of Economic Literature, 43*(3), 762-800.

Alesina, A., & Giuliano, P. (2015). Culture and institutions. *Journal of Economic Literature, 53*(4), 898-944.

Alesina, A., & Spolaore, E. (1997). On the number and size of nations. *The quarterly journal of economics, 112*(4), 1027-1056.

Alesina, A. F., & Reich, B. (2015). Nation building.

Anand, S., & Sen, A. (2000). Human development and economic sustainability. *World Development, 28*(12), 2029-2049.

Anderson, B. S. (2022). Endogeneity in strategic entrepreneurship research. In *Research Handbook on Strategic Entrepreneurship* (pp. 233-263): Edward Elgar Publishing.

Arnold, B. F., Ercumen, A., Benjamin-Chung, J., & Colford Jr, J. M. (2016). Brief report: negative controls to detect selection bias and measurement bias in epidemiologic studies. *Epidemiology (Cambridge, Mass.), 27*(5), 637.

Ball, J. (2010). Educational equity for children from diverse language backgrounds: mother tongue-based bilingual or multilingual education in the early years: summary.

Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: Does the composition of the top team make a difference? *Strategic management journal, 10*(S1), 107-124.

Barro, R. J. (1998). Human capital and growth in cross-country regressions. *Harvard University*.

Barro, R. J., & Lee, J.-W. (1994). *Sources of economic growth.* Paper presented at the Carnegie-Rochester conference series on public policy.

Barro, R. J., & Lee, J. W. (2013). A new data set of educational attainment in the world, 1950–2010. *Journal of Development Economics, 104*, 184-198.

Bellini, E., Ottaviano, G. I., Pinelli, D., & Prarolo, G. (2013). *Cultural diversity and economic performance: evidence from European regions*: Springer.

Bettis, R., Gambardella, A., Helfat, C., & Mitchell, W. (2014). Quantitative empirical analysis in strategic management. *Strategic management journal*, 949-953.

Bove, V., & Elia, L. (2017). Migration, Diversity, and Economic Growth. *World Development, 89*, 227-239. doi:10.1016/j.worlddev.2016.08.012

Brock-Utne, B. (2001). Education for all - in whose language? *Oxford Review of Education, 27*(1), 115-134. doi:10.1080/03054980125577

Brown, P., & James, D. (2020). Educational expansion, poverty reduction and social mobility: Reframing the debate. *International Journal of Educational Research, 100*, 101537.

Caraballo, M. Á., & Buitrago, E. M. (2019). Ethnolinguistic diversity and education. A successful pairing. *Sustainability*, *11*(23), 6625.

Cheng, S., & Li, H. (2012). New firm formation facing cultural and racial diversity. *Papers in Regional Science, 91*(4), 759-774.

Chiswick, B. R. (1988). Differences in education and earnings across racial and ethnic groups: Tastes, discrimination, and investments in child quality. *The quarterly journal of economics, 103*(3), 571-597.

Chiswick, B. R. (1991). Speaking, reading, and earnings among low-skilled immigrants. *Journal of labor economics, 9*(2), 149-170.

Clemens, M. A., Özden, Ç., & Rapoport, H. (2014). Migration and development research is moving far beyond remittances. *World Development, 64*, 121-124.

Collier, P. (2001). Implications of ethnic diversity. *Economic policy, 16*(32), 128-166.

Collier, P. (2009). The political economy of state failure. *Oxford Review of Economic Policy, 25*(2), 219-240.

Coombs, P. H. (1985). The world crisis in education the view from the eighties: Oxford University Press.

Dale-Olsen, H., & Finseraas, H. (2020). Linguistic diversity and workplace productivity. *Labour Economics, 64*, 101813.

Demery, L., & Gaddis, I. (2009). Social Spending, Poverty and Gender Equality in Kenya-A Benefit Incidence Analysis. *Eschborn: German Technical Cooperation*, 1-38.

Desmet, K., Ortuño-Ortín, I., & Wacziarg, R. (2016). Linguistic cleavages and economic development. In *The Palgrave handbook of economics and language* (pp. 425-446): Springer.

Drèze, J., & Sen, A. (2002). Democratic practice and social inequality in India. *Journal of Asian and African studies, 37*(2), 6-37.

Duncan, G. J., Brooks-Gunn, J., & Klebanov, P. K. (1994). Economic deprivation and early childhood development. *Child development, 65*(2), 296-318.

Dustmann, C., & Fabbri, F. (2003). Language proficiency and labour market performance of immigrants in the UK. *The economic journal, 113*(489), 695-717.

EASTERLY, W. (1999). PUBLIC GOODS AND ETHNIC DIVISIONS* ALBERTO ALESINA REZA BAQIR. *Technology, 1243*.

Easterly, W., Alesina, A. F., & Baqir, R. (1997). Public Goods and Ethnic Divisions. *Available at SSRN 46092*.

Easterly, W., & Levine, R. (1997). Africa's growth tragedy: policies and ethnic divisions. *The quarterly journal of economics*, 1203-1250.

Eifert, B., Miguel, E., & Posner, D. N. (2010). Political competition and ethnic identification in Africa. *American journal of political science, 54*(2), 494-510.

Fearon, J. D. (2003). Ethnic and cultural diversity by country. *Journal of Economic Growth, 8*(2), 195-222.

Fearon, J. D., & Laitin, D. D. (2003). Ethnicity, insurgency, and civil war. *American political science review, 97*(1), 75-90.

Fiala, O., & Delamonica, E. (2022). Public Spending and Investment in Children: Measuring and Assessing Social and Economic Justice. In *Social Justice for Children in the South* (pp. 43-59): Springer.

Flew, T. (2010). Toward a cultural economic geography of creative industries and urban development: introduction to the special issue on creative industries and urban development. *The information society, 26*(2), 85-91.

Gershman, B., & Rivera, D. (2018). Subnational diversity in Sub-Saharan Africa: Insights from a new dataset. *Journal of Development Economics, 133*, 231-263.

Glaeser, E. L., Kallal, H. D., Scheinkman, J. A., & Shleifer, A. (1992). Growth in cities. *Journal of political economy, 100*(6), 1126-1152.

Gören, E. (2014). How Ethnic Diversity Affects Economic Growth. *World Development, 59*, 275-297. doi:10.1016/j.worlddev.2014.01.012

Gradstein, M., & Justman, M. (2002). Education, social cohesion, and economic growth. *american economic Review, 92*(4), 1192-1204.

Graham, B. E. (2010). Mother tongue education: necessary? Possible? Sustainable? *Language and Education, 24*(4), 309-321.

Greenberg, J. H. (1956). The measurement of linguistic diversity. *Language, 32*(1), 109-115.

Guiso, L., Sapienza, P., & Zingales, L. (2006). Does culture affect economic outcomes? *Journal of Economic perspectives, 20*(2), 23-48.

Gurevich, T., Herman, P., Toubal, F., & Yotov, Y. (2021). One nation, one language? domestic language diversity, trade and welfare.

Hanushek, E. A., & Woessmann, L. (2012). Do better schools lead to more growth? Cognitive skills, economic outcomes, and causation. *Journal of Economic Growth, 17*, 267-321.

Hanushek, E. A., & Wößmann, L. (2007). The role of education quality for economic growth. *World Bank policy research working paper*(4122).

Hardach, S. (2018). Speaking more than one language can boost economic growth. *World*.

Hartenian, L. S., & Gudmundson, D. E. (2000). Cultural diversity in small business: Implications for firm performance. *Journal of Developmental Entrepreneurship, 5*(3), 209.

Heltberg, R., Simler, K. R., & Tarp, F. (2003). *Public spending and poverty in Mozambique*. Retrieved from

Hjort, J. (2014a). Ethnic divisions and production in firms. *The quarterly journal of economics, 129*(4), 1899-1946.

Hjort, J. (2014b). Ethnic Divisions and Production in Firms

*. *The quarterly journal of economics, 129*(4), 1899-1946. doi:10.1093/qje/qju028

Horvath, T., & Huber, P. (2019). Regional ethnic diversity and the employment prospects of immigrants. *Regional Studies, 53*(2), 272-282.

Horwitz, A. V., & Wakefield, J. C. (2007). The loss of sadness: How psychiatry transformed normal sorrow into depressive disorder: Oxford University Press.

Hou, D. (2022). The Impact of Education on Domestic Terrorism in Asia: A Control Function Approach. *Defence and Peace Economics, 33*(7), 857-875.

Hunt, V., Prince, S., Dixon-Fyle, S., & Yee, L. (2018). Delivering through diversity. *McKinsey & Company, 231*, 1-39.

Jacobs, B. D. (1992). Fractured cities: Capitalism, community, and empowerment in Britain and America: Psychology Press.

Jain, T. (2011). Common tongue: The impact of language on economic performance.

Jones, J. C. H., Nadeau, S., & Walsh, W. D. (1999). Ethnicity, productivity and salary: player compensation and discrimination in the National Hockey League. *Applied Economics, 31*(5), 593-608.

Karnane, P., & Quinn, M. A. (2019). Political instability, ethnic fractionalization and economic growth. *International Economics and Economic Policy, 16*(2), 435-461.

Kemeny, T. (2012). Cultural diversity, institutions, and urban economic performance. *Environment and Planning A, 44*(9), 2134-2152.

Kumari, M. Mother Tongue and Language Rights from the Perspective of Tribal Children Primary Education.

Laitin, D. D., & Ramachandran, R. (2015). Linguistic diversity, official language choice and nation building: Theory and evidence. *Unpublished Manuscript*, 1-48.

Laitin, D. D., & Ramachandran, R. (2016). Language policy and human development. *American political science review, 110*(3), 457-480.

Lang, K. (1986). A language theory of discrimination. *The quarterly journal of economics, 101*(2), 363-382.

Lee, A. (2018). Ethnic diversity and ethnic discrimination: Explaining local public goods provision. *Comparative Political Studies, 51*(10), 1351-1383.

Lipman, P. (2004). High stakes education: Inequality, globalization, and urban school reform: Psychology Press.

Lohmann, J. (2011). Do language barriers affect trade? *Economics Letters, 110*(2), 159-162.

Lu, G., Ding, X. D., Peng, D. X., & Chuang, H. H.-C. (2018). Addressing endogeneity in operations management research: Recent developments, common problems, and directions for future research. *Journal of Operations Management, 64*, 53-64.

Marschak, J. (1965). Economics of language. *Behavioral Science, 10*(2), 135-140.

Marshall, A., & Marshall, M. P. (1920). *The economics of industry*: Macmillan and Company.

Mauro, P. (1995). Corruption and growth. *The quarterly journal of economics, 110*(3), 681-712.

McMahon, W. W. (2000). Education and development: Measuring the social benefits: Clarendon Press.

Mickiewicz, T., Hart, M., Nyakudya, F., & Theodorakopoulos, N. (2019). Ethnic pluralism, immigration and entrepreneurship. *Regional Studies, 53*(1), 80-94.

Montalvo, J. G., & Reynal-Querol, M. (2005). Ethnic diversity and economic development. *Journal of Development Economics, 76*(2), 293-323. doi:10.1016/j.jdeveco.2004.01.002

Montalvo, J. G., & Reynal-Querol, M. (2014). Cultural diversity, conflict, and economic development. In *Handbook of the Economics of Art and Culture* (Vol. 2, pp. 485-506): Elsevier.

Moreno-Fernández, F., & Otero, J. (2008). The status and future of Spanish among the main international languages: Quantitative dimensions. *International Multilingual Research Journal, 2*(1-2), 67-83.

Mufwene, S. S. (2010). The role of mother-tongue schooling in eradicating poverty: A response to Language and poverty. *Language, 86*(4), 910-932.

Munir, F., Ahmad, S., Ullah, S., & Wang, Y. P. (2022). Understanding housing inequalities in urban Pakistan: An intersectionality perspective of ethnicity, income and education. *Journal of Race, Ethnicity and the City*, *3*(1), 1-22.

Mweri, J. (2020). Sustainable Development Goals: Reaching People through Their Mother Tongue. *Linguistics and Literature Studies*, *8*(1).

Naveed, A., & Sutoris, P. (2020). Poverty and education in South Asia. *Handbook of education systems in South Asia*, 1-23.

Niebuhr, A. (2010). Migration and innovation: Does cultural diversity matter for regional R&D activity? *Papers in Regional Science*, *89*(3), 563-585.

Ottaviano, G. I., & Peri, G. (2006). The economic value of cultural diversity: evidence from US cities. *Journal of Economic geography*, *6*(1), 9-44.

Peck, J. (2011). Creative moments. Mobile urbanism: Cities and policymaking in the global age.

Persson, T., & Tabellini, G. (1992). Growth, distribution and politics. *European Economic Review*, *36*(2-3), 593-602.

Posner, M. I., Snyder, C. R., & Solso, R. (2004). Attention and cognitive control. *Cognitive psychology: Key readings*, *205*.

Rajkumar, A. S., & Swaroop, V. (2008). Public spending and outcomes: Does governance matter? *Journal of Development Economics*, *86*(1), 96-111.

Ramachandran, R. (2012). Language use in education and primary schooling attainment: evidence from a natural experiment in Ethiopia. *IEB Working Paper 2012/34*.

Ranis, G., Stewart, F., & Ramirez, A. (2000). Economic growth and human development. *World Development*, *28*(2), 197-219.

Ratna, N., Grafton, R. Q., & To, H. (2017a). The 'Paradox of Diversity': Economic Evidence from US Cities 1980-2010. *Asia & the Pacific Policy Studies*, *4*(1), 20-37. doi:10.1002/app5.162

Ratna, N., Grafton, R. Q., & To, H. (2017b). The 'Paradox of Diversity': Economic evidence from US cities 1980–2010. *Asia & the Pacific Policy Studies*, *4*(1), 20-37.

Ratna, N. N., Grafton, Q., & MacDonald, I. A. (2012). Does multiculturalism pay? Empirical evidence from the United States and Canada. *Economic Papers: A journal of applied economics and policy*, *31*(4), 401-417.

Ratna, N. N., Grafton, R. Q., & Kompas, T. (2009). Is diversity bad for economic growth?: Evidence from state-level data in the US. *The Journal of Socio-Economics*, *38*(6), 859-870.

Ratna, R., Sethi, M., Abrol, S., Gupta, R., & Agrawal, U. (2014). ManageMent of cultural diversity in it sector. *Journal of Organisation and Human Behaviour*, *3*(4).

Rodríguez-Pose, A., & von Berlepsch, V. (2019). Does population diversity matter for economic development in the very long term? Historic migration, diversity and county wealth in the US. *European Journal of Population, 35*(5), 873-911.

Rossi, P. E. (2014). Even the rich can make themselves poor: A critical examination of IV methods in marketing applications. *Marketing Science, 33*(5), 655-672.

Schild, C.-J., & Wrede, M. (2015). Cultural identity, mobility and decentralization. *Journal of Comparative Economics, 43*(2), 323-333.

Semadeni, M., Withers, M. C., & Trevis Certo, S. (2014). The perils of endogeneity and instrumental variables in strategy research: Understanding through simulations. *Strategic management journal, 35*(7), 1070-1079.

Shaban, A., & Cadene, P. (2023). Causality Between Cultural Diversity and Economic Growth in India: Cross-State Study, 1990–1991 through 2017–2018. *Society*, 1-14.

Shaban, A., & Khan, S. (2022). Cultural diversity, human capital, and regional economic growth in India. *Regional Science Policy & Practice*.

Spolaore, E., & Wacziarg, R. (2009). The diffusion of development. *The quarterly journal of economics, 124*(2), 469-529.

Sun, B., Zhu, P., & Li, W. (2019). Cultural diversity and new firm formation in China. *Regional Studies, 53*(10), 1371-1384.

Tsui, A. B., & Tollefson, J. W. (2004). The centrality of medium-of-instruction policy in sociopolitical processes. *Medium of instruction policies: Which agenda*, 1-18.

Vandenbussche, J., Aghion, P., & Meghir, C. (2006). Growth, distance to frontier and composition of human capital. *Journal of Economic Growth, 11*, 97-127.

Welch, D. E., & Welch, L. S. (2008). The importance of language in international knowledge transfer. *Management International Review, 48*, 339-360.

Chapter 4

4 Essay 4: A Critique of "Language in Education Policies" in Pakistan: The Economic Perspective of Past, Present, and Future

Abstract

The present study seeks to explain the provision of education during the British colonial rule in the subcontinent and the extent to which Pakistani educational policies adhere to colonial legacies. This investigation concluded that Pakistan remains entangled in colonialism despite achieving independence. Pakistan's education system has been hindered in addressing its language in education needs due to the influence of the ruling class and their interests, which have prevented the country from achieving independence from colonial reasoning. Pakistan might contend with neocolonialism via education, which is stratified by economic class, resulting in a concentration of opportunities among a tiny elite who possess proficiency in English. At the global level, there is a contention that utilizing a language of instruction that is not the learner's primary language poses a considerable obstacle to achieving high-quality education across all stages of education. In addition, it is more probable for children to attain proficiency in a foreign language if they acquire literacy skills in their primary language beforehand. Concerning the friction between Urdu, English, and other regional languages, there is a repeated imperative to advocate for the attainment of 'universal literacy' in one's mother language rather than considering one language at the expense of the other. The proposition is that education policies adopting the Single National Curriculum (SNC) in Pakistan can eliminate the existing class-based education system. Promoting a fair and comprehensive educational atmosphere can be facilitated by implementing SNC in all educational institutions, irrespective of their public or private nature.

Keywords: Language in Education; Language Policy; Thematic Analysis; Class based Education; Single National Curriculum

4.1 Introduction and Research Background

Pakistan inherited the colonial legacy of educational policies and practices from independence, i.e., 1947. In the Indian subcontinent, the British colonial ruler used the British education system to use education as a political tool to extend their supremacy

(Altbach, 2008). The colonial education policies implemented “English” as the prestigious language in the Indian Subcontinent to maximize control over the colony. The end of colonial rule in the Indian subcontinent created population migration and partitioned the previously “British India” into two separate countries in 1947, i.e., Pakistan and India; however, Bangladesh separated from Pakistan in 1971 (Hamid & Rahman, 2019).

Despite the passage of almost 75 years since the exit of colonizers, the utilization, instruction, and acquisition of the English Language and education in contemporary Pakistan continue to exhibit a noticeable continuity with the colonial educational remnants (Peshkin, 1962). The foundation of educational planning in Pakistan did not gain any pace, and it is not in the prior interests of the policymakers (Husain, 2009). Simultaneously, persistent tension between English and nationalistic pursuit resulted in significant friction in the emergence of nearly incompatible divisions in developing explicit language policies within the nation.

A small number of elites in Pakistan have control over policy, capital, and production, and in the same way, schooling in Pakistan also serves a small section of society (Shamim, 2008). Pakistan’s few elites benefit from formal education, while educational opportunities are unavailable to low-income people. These existing class inequalities in education intensified when Pakistan adopted an inconsistent language in education policy (Haidar, 2017).

This research critically evaluated the historical literature on language in education policy of colonial educational policies before independence and then presented an analysis of the language in education across a class structure of education taken since the 1947s that has created educational inequality and strategically excluded people with low incomes from opportunities. Every formulated education and language policy did not achieve its set objectives and goals, as every policy has imposed foreign imperialism in education by promoting the colonial language. This study examined the predominant historical language in education patterns and policies implemented for reform and English education within the Pakistani education system (Altbach, 2008).

4.2 Significance, Research Gap, and Contribution

UNESCO (1953) stated that a child's native language is the optimal teaching medium. Psychologically, the system of meaningful signs in his mind functions automatically for expression and comprehension. Sociologically, it is a means of

identification among his fellow community members. Academically, a student can learn more quickly through this medium than a foreign language. In Pakistan, the language question is the colonial era from where class-based education was correlated with the economic well-being of Pakistan. The language of instructions is the fundamental question that needs to be answered from an economic point of view. Moreover, languages in education perhaps create a socioeconomic divide among various social groups (Bamgbose, 2003).

However, Cooper and Cooper (1989) referred to language planning as the deliberate efforts to influence the behavior of others concerning the acquisition, structure, or functional allocation of their language codes. First, language policies do the status planning in which the policy decisions are taken by the government and reinforced with the support of the apparatus of the State rather than linguists; hence, the State will decide the national or official language of the State (Kloss, 1969). Next is status planning, as Cooper and Cooper (1989) described it as language shift (Shifting of speakers from the use of one language to another), usually towards a language of more power from a language of less power (Fishman, 1991). Then, corpus planning incorporates the efforts to alter and improve the status of a language with the policy decisions and implementation attempts (Fishman, 1997), and linguists can do it after the major policy decisions.

To answer this question, it is of core importance to have a detailed look at the education policies of Pakistan and language planning in Pakistan and how these policies are contributing to the economic productivity of Pakistan. The economic approach to language produces remarkably diverse relationships. Language planning can also be termed language engineering (Miller, 1950), language development (Unesco & Noss, 1967), and language management (Neustupný, 1970).

The present study considered various language policies in education adopted in the past and critically analyzed the economic/political factors behind adopting these policies. In addition, the researcher explored the critical economic/political interests of the different groups associated with the language panning policies in education. Novel content analysis is utilized to find the concepts, and this research attempted to illustrate how these language policies contributed to the (un)equal access to education opportunities for various income and language groups in Pakistan.

The utilization of Leximancer to examine language policies encompassing from 1947 to 2020 is performed to yield significant findings regarding the key themes and consistency apparent in Pakistan's education policies. Leximancer produces concept maps visually representing the primary themes and concepts extracted from the education policies. Examine the concept maps to identify the occurring themes, which identify clusters of interconnected concepts to comprehend the fundamental concepts present in the policies.

Identifying coherence and inconsistencies involves examining the education policies for patterns of consistency, which emphasizes if there are divergent methodologies employed in various policies. Comprehending the coherence of education policy could offer valuable insights into the persistence of educational policy objectives and approaches. External factors are considered while analyzing education policies in Pakistan. These factors include constitutional provisions, language in education, demographic indicators, educational reforms, and international influences that have contributed to the development of educational policies in Pakistan, which enhanced the depth of content analysis and facilitated the explication of the observed patterns.

4.3 Research Objective

The Constitution (1973) ensures equality and well-being of all citizens and no discrimination based on sex, caste, or race. Article 37 stipulates that the State shall (a) promote with special care the educational and economic interests of backward classes or areas, (b) remove illiteracy and provide free and compulsory education within the minimum possible period, and (c) make technical and professional education generally available and higher education equally accessible to all based on merit.

1. Critically analyze social/economic/political factors involved in formulating education policies and bring evidence of how these policies assisted in spreading (in)equalities among various socioeconomic groups in Pakistan.

4.4 Literature Review

4.4.1 Historical Background

The dissemination of knowledge has historically been a distinguishing feature of Islamic civilization in the South Asian region. Muslims have been instructed to pursue education as a religious obligation and draw connections between empirical observations

and the underlying causes, fostering spiritual growth through learning. Regrettably, despite the unambiguous instruction, a significant demographic was denied access to the advantages of formal learning due to certain socioeconomic and socio-political factors (Altbach, 2008; Peshkin, 1962).

Implementing a modified education system by Muslims resulted in enhancements in social conduct, interpersonal communication, relationships, matrimonial alliances, and education and instruction. From the era of Muhammad bin Qasim (695-715) to that of the Mogul Emperor Humayun (1540-1556), educational institutions appreciated complete autonomy in their internal affairs and administration. They were at liberty to adopt any syllabus they considered appropriate. Sultan Sikandar Lodhi, who ruled from 1489 to 1517, made a significant contribution to the cultural heritage of his kingdom by establishing Persian as the official language. Subsequently, under the reign of Mogul Emperor Akbar (1556-1605), the educational system began to shift away from its religious foundation due to the implementation of his adaptable policies. During the reign of Mogul Emperor Aurangzeb (1658-1707), education was extensively disseminated, resulting in the emergence of scholars and erudite individuals in various fields, even in small towns and villages.

4.4.2 Educational Provision During the Colonial Period

The history of education in the Indian subcontinent can be traced back to ancient times when an indigenous educational system was prevalent. During the medieval period, the Islamic style of education achieved prominence because of Muslim invasions. Subsequently, during the British colonization era, imperialistic education was introduced. Before the early 19th century, the East India Company displayed a general lack of interest in education in the Indian subcontinent. However, during the period above, the European missionary East India Company took the initiative to establish multiple schools and colleges to encourage an educational program in the region (Riaz, 2011). Divergent viewpoints existed among colonial administrators concerning the objectives of educating the people of the subcontinent, the mode of instruction, the administration of educational institutions, and the means of extending educational opportunities throughout the nation (Faust & Nagar, 2001; Rahman et al., 2010; Viswanathan, 2022). According to Kumar (1991), the East India Company initially acknowledged its obligation to advance education in British India to enhance oriental languages and literature and augment the understanding

of Western sciences among the Indian populace. In 1835, Thomas Macaulay (1800-1859) expressed the superiority of Western culture and the English Language, advocated for the education of the upper classes, and fervently advocated for the dissemination of Western knowledge through the use of English as a medium of instruction (Ghosh, 2002; Kumar, 1991).

In 1837, the East India Company established English as the official language of administration, thereby marking its formal entry into the education sector of the subcontinent. Implementing the new policy led to a swift expansion of English schools and colleges, as evidenced by (Mukerji, 1957; Seal, 1968). Furthermore, the prevalence of English as the primary medium of instruction gained prominence across the educational landscape (Ghosh, 2004; Roy, 1993). The financial crisis and English domination posed significant challenges for Indigenous educational institutions (Chatterjee, 1986). (Mukerji, 1957) contemplated that English was mandated as a core subject in secondary education for enrollment and a prerequisite for admission to higher education institutions. During the early 19th century, a British-inspired system of liberal English-language schools was established (Nurullah & Naik, 1962; Shukla, 1996).

Lord Curzon's education policy was published as a government resolution in 1904, following the all-Indian Education Conference at Shimla in 1901. This policy significantly impacted the high school level, particularly in public schools designed to serve the masses, as it increased venularization (Mukerji, 1957). Moreover, Takayama (2016) corroborated that elite schools, including European and convent schools, utilized English as the primary language of instruction, limiting access to education for many Indians based on their socioeconomic status or birth circumstances. From 1919 through 1921, reforms were implemented to provide access to elementary education in urban municipalities and rural unions. In 1930, establishing a provincial education department marked the initiation of the centralization and bureaucratization of education. The Hertz Committee of 1927 recommended the establishment of a Central Advisory Board in 1935 to facilitate policy formulation in the field of education. 1945 marked the establishment of an independent Education Department under the purview of the Central Government. The duties and obligations of this department were assigned to a member of the Central Executive, as documented by Nurullah and Naik in 1951. The British assumed the responsibility of addressing the educational underdevelopment of the Indian sub-continent (Fischer-Tiné & Mann, 2004).

The curriculum delivered by the previously mentioned did not foster the acquisition of practical capabilities or specialization. Rather than promoting a diverse range of subjects, educational institutions prioritized classical and humanistic curricula to maintain the aristocratic preferences and behaviors of the upper class, forming a dependent elite (Ilon, 2000; Mukerji, 1957). Lit is highlighted by Roy (1993) that a group of individuals belonging to the upper elite of society was afforded opportunities for employment and social mobility to a certain extent. Their duties primarily involved providing clerical and administrative assistance to the colonial government, which operated in regions with significant linguistic and cultural diversity. Additionally, this group demonstrated a strong preference for British products (Chatterjee, 1986).

The emergence of a new elite resulted in an impression of disengagement from the masses, who could not participate in the newly established education system (Bhattacharya, 2005). The barriers to enrollment in schools for individuals with low incomes in British India were primarily economic and socio religious. Low-income individuals were subjected to socio-religious restrictions associated with their caste, which were intended to impede their access to education. The financial burden of education constituted a significant deterrent for individuals with limited financial resources, thereby impeding their access to educational opportunities (Peshkin, 1962; Rahman et al., 2010). For individuals with limited financial resources, economic considerations such as direct expenses related to education, including fees, textbooks, uniforms, and other related costs, as well as indirect costs, such as the loss of potential earnings while the child is in school, are crucial. Individuals with limited financial resources may encounter difficulties overcoming these obstacles to attain knowledge. The colonial government implemented an education policy that adhered to the "filtration theory" (Bray, 1993) rather than pursuing efforts to uplift individuals from low-income backgrounds. Nurullah and Naik (1962) criticized the British for their inability to establish a comprehensive national education system, failure to integrate Eastern and Western cultures, disregard for local education, and absence of a cohesive strategy or sustained effort to achieve a predetermined objective.

4.4.3 Pakistan's Education System- A Colonial Remnant

Education in Pakistan cannot be fully understood without returning its connection to the period of British colonialism in the Indian subcontinent. Similar to other colonies, the British colonizers implemented contemporary English education in the subcontinent,

intending to transform the native elites into devoted subjects of the colonial authority and its principles by establishing two types of educational institutions, English-medium and vernacular-medium, to assist their political ends catering to the transmissible nobility and the growing professional class (Khattak, 2014; Rahman, 1995; Tikly, 1999).

The objective of establishing such educational institutions was to cultivate a knowledgeable native upper stratum that espouses the principles and beliefs of the British colonists. The objective was not to teach the colonized population but to cultivate a subset of individuals who would exhibit punctuality, loyalty, and honesty toward ruling power (Victor, 2010). The cohort of educated individuals from the local elite acquired proficiency in the English Language and assimilated the attire and values of the colonizers to demonstrate their allegiance and appease them, resulting in their classification as a distinct social group within the colonized community. The colonizers employed this social class as a subordinate group in their governance and administrative systems, serving as a potent instrument to disseminate their cultural beliefs and principles to the remaining subjugated communities (Kassem et al., 2006). The cohort of learned individuals from the region served as intermediaries between the colonizing power and the subjugated population. Establishing a community comprising the native elites aligns with the colonizers' objective of fostering a similar group among the colonized people, which they sought to achieve through a strategic education policy (Rahman, 1995; Ramanathan, 2005; Victor, 2010).

The subcontinent's Muslim population resisted British colonial rule except for the economic elites. The colonizers aimed to establish modern secular education to cultivate loyal subjects. Most Muslims perceived contemporary secular education as potentially threatening their religious beliefs and cultural distinctiveness. Kassem et al. (2006) highlighted that many Muslims enrolled their children in Madaris for education, except for a few local elites. The primary objective of Madrassah schooling is to impart religious awareness and preserve Islamic individuality and native cultural beliefs from the impact of secularization (Riaz, 2011). The corresponding educational schemes have created hierarchies whereby Madaris graduates are perceived as the "Other" concerning the native elites (Victor, 2010). These deeds and strategies persisted until the sub-continent was partitioned into two autonomous nations: Pakistan and India.

Pakistan was characterized by a lack of institutional infrastructure and a largely impoverished and illiterate population upon its establishment in 1947. The significance of

modern secular education was emphasized in that it previously faced opposition and was not easily accessible to most Muslims, particularly those living in impoverished and rural areas (Kassem, 2006). Nonetheless, the State lacked the institutional infrastructure and resources to implement effective policy. Despite scarce resources, certain public schools were made in municipal areas to provide individuals with the necessary scientific and technical knowledge to effectively manage the nation's economy and administration (Ullah & Ali, 2018).

4.4.4 A Brief on Ideology and Language Adopted in Various Education Policies in Pakistan

The educational and language planning in Pakistan determines a solid promise to use Urdu in comparison to regional languages with uncertain economic outcomes and regarding the relative status of Urdu and English (Tamim, 2014), which is a significant challenge for education policymakers in Pakistan in the process of learning and attainment of educational goals (Siddiqui, 2016). The 1947 Pakistan Educational Policy emphasized education based on Islamic principles and incorporated spiritual, social, and vocational components. The provinces could choose the language of instruction based on their specific needs. The Second Educational Conference of 1951 proposed using the mother language as the medium of instruction at the primary level and Urdu at the secondary level. The 1959 National Education Commission enforced national unity and Islamic values. The 1969 Proposals for a New Educational Policy adopted an integrated, uniform education system based on Islamic principles. As in the Commission on National Education (1959), the New Education Policy of 1970 reintroduced education as a tool for inculcation Islamic values and national unity. This education policy emphasized English as the language of instruction. Education Policy, 1972 promotes the preservation, promotion, and application of Pakistan's fundamental ideology. The Education Policy of 1979 proposed the Islamization of Pakistan's educational system and the use of Urdu as the medium of instruction to achieve the goals. The Education Policy 1992 infused the educational system with an Islamic ethos and permitted it to permeate its branches. The provinces' decision regarding the medium of instruction could be provincial, national, or English. The Education Policy 1998 incorporated Quranic principles and Islamic practices into the curriculum. The Education Policy of 2009 fostered a sense of Pakistani nationalism, and English was chosen as the preferred language of instruction. In Pakistan, a minimum level

of English proficiency is required to obtain a white-collar job in the private or public sector. National Education Policy 2017 stated that education is a fundamental right for all citizens and a state responsibility, that Education for All (EFA) is the Agenda for Development as part of the UN's Sustainable Development Goals (SDGs), and that the Medium of Instructions may be either the local language or the national language (Urdu), with English as a required subject beginning in grade one.

4.5 Data and Methodology

Multiple rationales exist for conducting a content analysis of textual data. According to Nisbett and Wilson's research in 1977, it has been established that human decision-makers may be subject to unidentified influences. Moreover, mitigating subjectivity in human analysis requires a significant allocation of money and time toward the content analysis procedure. Content analysis is a research methodology that enables the extraction of reliable and accurate conclusions from textual data, which can be applied to specific contexts. Performing content analysis manually can be an extended process, and the issue of inconsistency is frequently encountered.

Leximancer is a tool that utilizes machine learning and data-mining techniques to facilitate the efficient analysis and comprehension of extensive and elaborate collections of natural language text data. Conceptual data, which is associated with the meaning of the text, as well as contextual data, are extracted by the software using algorithms based on statistical principles. Leximancer performs a computer-based examination of text documents to find the key ideas they contain. In contrast to manual coding, statistical tools enable the automated identification of concepts and themes in textual data (Cretchley et al., 2010). The thematic and relational analyses using Leximancer can mitigate analytical biases arising from biased notions during data collection (Cretchley et al., 2010; Harwood et al., 2015). However, because Leximancer enables objectively analyzing significant amounts of text data, it can help conduct empirical studies. Additionally, it makes identifying more structural features easier, raises the study's validity, and allows for reproducibility (Penn-Edwards, 2010).

The utilization of Leximancer is on the rise in diverse fields such as communication (Lemon & Hayes, 2020), tourism management (Tseng et al., 2015), and health research (Cretchley et al., 2010). The utilization of Leximancer has acquired an increasing level of attention among researchers who employ qualitative methods. Harwood et al. (2015)

observed that the Leximancer approach demonstrated notable similarities to the primary emergent themes identified through grounded theory analysis when applied in a grounded theory context. However, the authors caution that while the approach may help verify the completeness of open coding, it cannot fully replace human coding at the selective coding level. There is no scholarly inquiry into the utility and effectiveness of utilizing Leximancer as a qualitative data analysis method. This study aims to address the existing gap in the literature regarding the content analysis of language policy in Pakistan.

4.5.1 Data Sources

This research has used the language policies of Pakistan from 1947 to 2018, the Leximancer control panel, and used two-sentence text blocks as coding units and paragraphs as context units. Data of previously published Education policy documents to see how Leximancer could be used to enhance the reliability of the content analysis of qualitative data made the most sense to use data that resulted in an a priori conceptual model. Analyzing data solely from an inductive approach would not have been as helpful in answering the research question. The following documents are used for the content analyses.

Table 4-1 Education Policy/Commission Document List for Leximancer Analysis

No.	Education policy/commission	Year	Page's transcription
1.	Proceedings of the Pakistan Educational Conference	1949	98
2.	Report of the Commission on National Education	1959	339
3.	Report on the Progress of Education in Pakistan	1966-1967	20
4.	The New Education Policy of the Government of Pakistan	1970	31
5.	Education Policy	1972-1980	44
6.	National Education Policy and Implementation Program	1979	116
7.	National Education Policy	1992	101
8.	National Education Policy	1998-2010	141
9.	National Education Policy	2009	73
10.	National Education Policy	2017	184
11.	National Education Policy Framework	2018	14

These 11 policy documents resulted in 1161 transcription pages uploaded to Leximancer. The current study employed coding classifications developed using

Leximancer's software to construct a concept list, a pre-established technique for extracting concepts by analyzing word proximity and correlation within the text. The Leximancer output comprises a thematic representation of the primary concepts present in the text and their interrelationships, presented in the form of a conceptual map.

4.5.2 Discussion-Conceptual and Relational Analysis

The Leximancer tool offers a ranked list of critical concepts based on conceptual analysis. Concepts typically comprise a group of words that tend to co-occur within a given text. Figure 4-1 presents the emerging concepts and maps out the fundamental concept to elucidate the conceptual parameters of the topic.

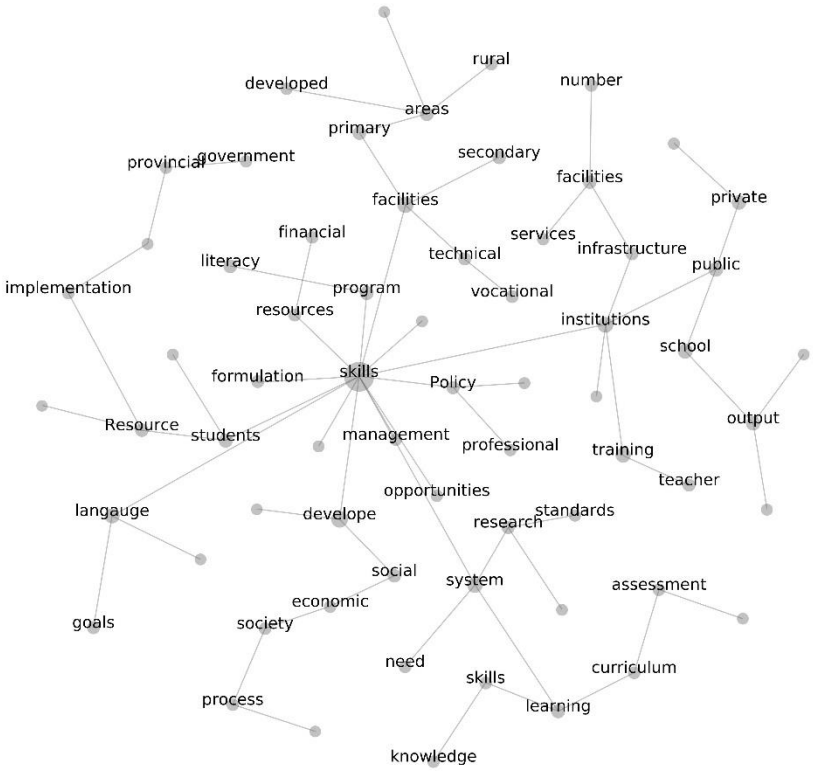


Figure 4-1 Education Policies Concepts Emerged at the Base Level

Using the Leximancer tool presents various benefits compared to conducting manual content analyses. Initially, it is noteworthy that content analysis is a process that can be hard. However, using software has significantly reduced the time required for this task. It is estimated that using Leximancer reduces the necessary time by a minimum of 50 percent. The issue of unreliability is a frequently encountered concern among content analysts. However, using Leximancer's automated techniques for thesaurus development

can mitigate subjectivity. According to Sotiriadou et al. (2014), a comparative analysis was conducted between two computer-based software for qualitative data analysis, i.e., NVivo, and Leximancer. The study revealed that Leximancer was more effective in objective data analysis, providing various output choices, including quantitative reports. Users are given the option to select from various outputs of relational analysis. The findings are interpreted with various potential limits. First, it is assumed public schools at a constant correlation exists concerning the chosen texts and the context of their source. Second, it was restricted to only educational policy documents.

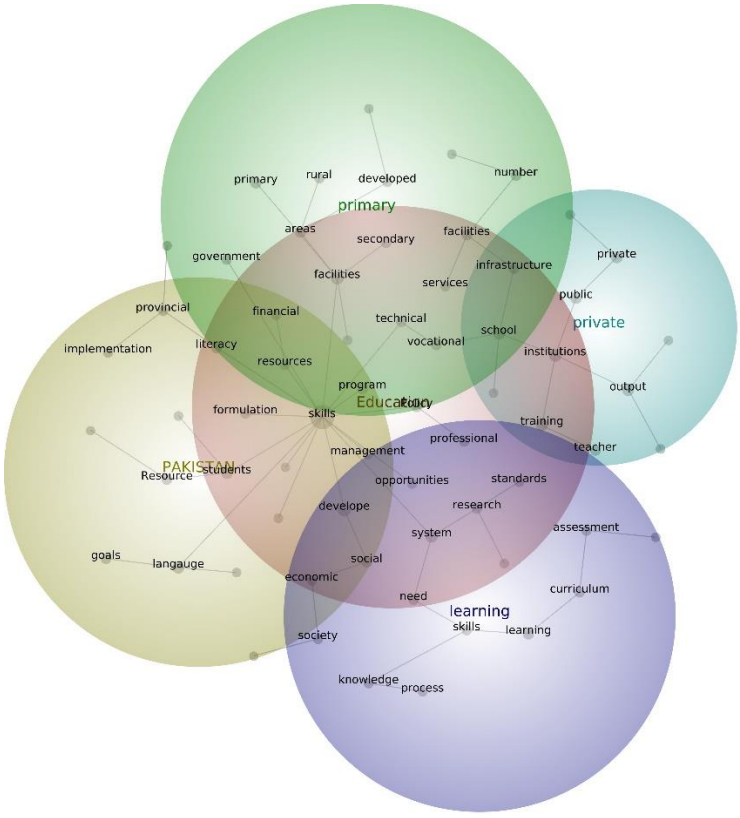


Figure 4-2 Education Policies Concepts Emerged With Various Themes

Moreover, the concepts are organized into broader concepts connected with education, learning, private institutions, primary education, and Pakistan. The theme that received the highest rank labelled "Education" by default, was found to be in the same map space as the other top-ranking themes. Notably, this theme encompassed other related concepts such as learning, private, and Pakistan, which is consistent with the source of our text. The theme that ranked second in importance, labelled as "primary," encompassed additional concepts such as private and Pakistan. The theme that ranked third in significance, denoted as "learning," embodied other notions such as education, private, and education.

The second highest-rank theme is "Private" and related to education. The primary focus of this theme relates to the notion of independent educational institutions and their function within the broader framework of the educational system. The elements above, namely institutions, output, infrastructure, training, teachers, and schools, are interrelated themes that imply that private education encompasses various factors, including the creation and operation of educational management, the consequences attained by private schools, the infrastructure and facilities equipped by these institutions, the education and growth of teachers, and the comprehensive operation and administration of private schools.

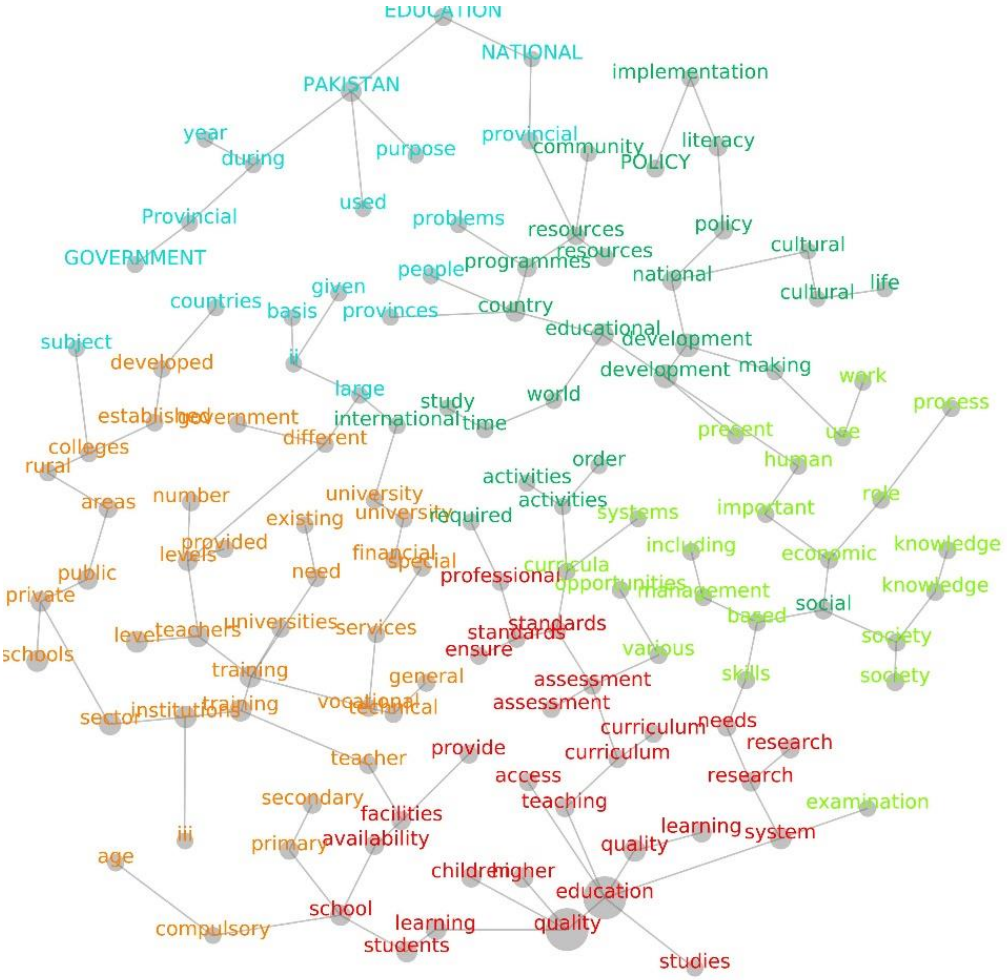


Figure 4-3 Education Policies Concepts Emerged With Various Themes at Base Level

The text highlights the importance of education and private education within the Pakistani context. The text elucidates the multifaceted dimensions of education, encompassing aspects such as standards of professionals in education, available resources, prospects for advancement, technical and vocational proficiencies, administrative oversight, the involvement of private entities, infrastructure, pedagogical training, educators, and educational institutions which offer discernment into the fundamental themes and concepts about education in Pakistan.

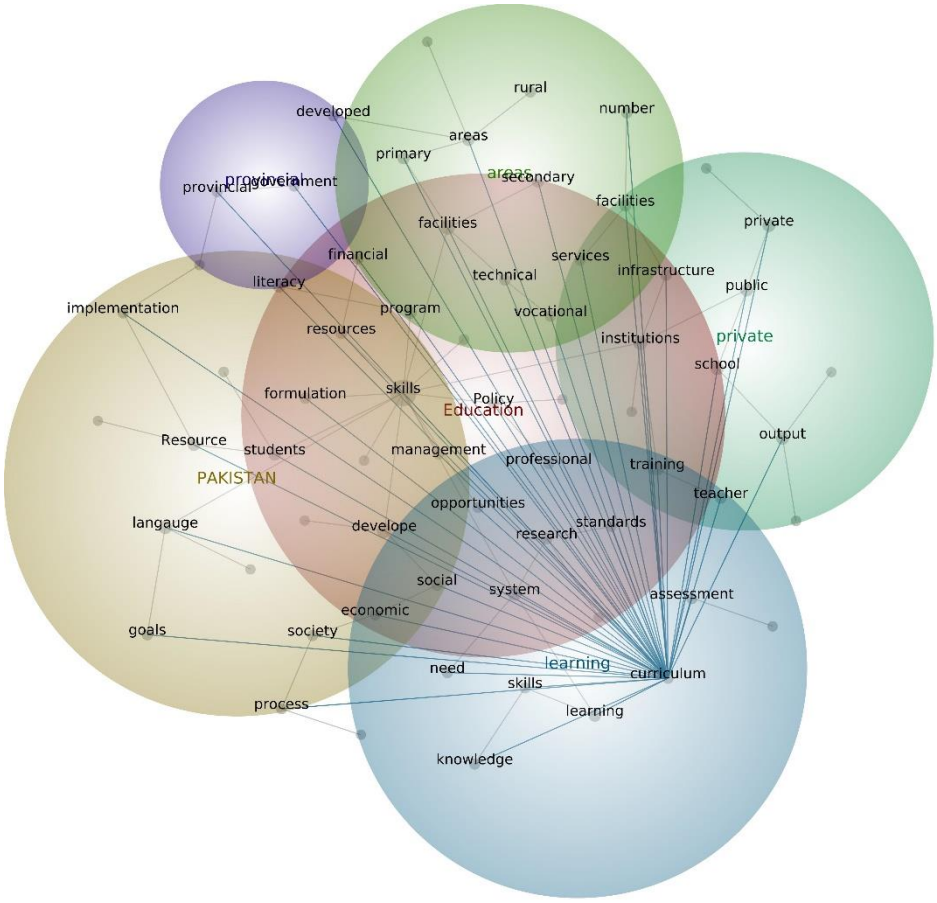


Figure 4-4 Mapping Curriculum With Education Policies Emerged Concepts

The education system in Pakistan encounters various obstacles, such as language-related concerns in education and a stratified educational framework, which rise to inequalities in the availability of high-quality education and impede the advancement of education within the nation. Pakistan has significant linguistic diversity, in which numerous regional languages are spoken alongside Urdu, the official national language. Additionally, more than half of the population connects in languages other than Urdu. The

education system primarily functions in Urdu and English, resulting in linguistic challenges for many students (Manan et al., 2017; Rahman & Singh, 2020; Ratna et al., 2017a). The situation unveils challenges for students whose primary language is not Urdu or English, as they might experience difficulties in comprehending the syllabus and achieving academic achievement. Language barriers can potentially restrict the possibilities of individuals in terms of seeking higher education and securing employment opportunities.

Apart from language barriers, Pakistan's education system presents interesting inequalities influenced by socioeconomic status. The provision of quality education is frequently inequitable, with an undue advantage given to families with higher income levels. At the same time, children hailing from lower-income households encounter significant impediments to their educational attainment. However, inadequate infrastructure, limited resources, and insufficiently trained teachers often harm the standard of education provided in public schools, particularly those in remote regions. The perpetuation of educational inequity constitutes an obstacle to the integrated growth of marginalized people (Kyeyune, 2003; Tamim, 2021).

Private education has a considerable impact on the educational environment of Pakistan, particularly for individuals who have the resources needed to attend it. The second area relates to private education and includes interrelated concepts such as educational institutions, academic outcomes, physical facilities, academic preparation, educational staff, and academic institutions. Private schools often offer superior educational standards to public schools, thus taking in families with enough money to afford the higher fees. Nonetheless, this contributes to the educational disparity by excluding numerous low-income kids who lack the financial means to attend private schools (Grin, 2003; Okebukola et al., 2013; Victor, 2010).

4.5.3 Socioeconomic Consequences of Language in Education

Following the initial examination, it can be inferred that the educational system in Pakistan is stratified based on socioeconomic status, resulting in distinct educational systems for each income-based social class. The educational institutions under the State's control have received significant criticism owing to their substandard instruction (Khan et al., 2020; Tanveer et al., 2020). Furthermore, educational institutions functioning through the government struggle with inadequate access to physical resources in classrooms and insufficient provision for learners and educators, perhaps due to a lack of commitment to

educational policy priorities. Therefore, it is recognized that an absence of commitment towards accomplishing egalitarian educational objectives results in higher dropouts and persistent educational disparities based on gender and rural-urban divide (Mughal & Aldridge, 2017). Table 4-2 briefly examines several essential education indicators and then considers Pakistan's four main types of school-level institutions.

Table 4-2 Percentage of students enrolled at various levels of education in Pakistan

	Primary	Secondary	Higher	Other
Pakistan	54.7	38.51	5.75	1.04
	(65)	(44)	(34)	
Male	53.08	39.79	5.83	1.29
	(66)	(45)	(34)	
Female	56.92	36.75	5.64	0.68
	(64)	(43)	(34)	

Source: Pakistan Education Statistics (2017)

Note: Enrollment survival rate is presented in parenthesis

Table 4-2 illustrates that 54.7 percent of students are enrolled in the primary level of education, which shows that only 53.08 percent of males and 56.92 percent of females are in primary school. Only 65 percent survive until year 5; males share a 66 percent survival rate, and females survive 64 percent. Moreover, 38.51 percent of individuals are enrolled at the secondary level of education, among which 39.79 percent are males, and 36.75 are females, which have 44 percent, 45 percent, and 43 percent survival rates till year 8 for total males and females, respectively. Similarly, higher education shares 5.75 percent total with a survival rate of 34 percent, males share 5.83 percent in higher education with 34 percent, and females share 5.64 percent enrollment in the higher education survival rate of 34 percent. Moreover, research has indicated that the proportion of female out-of-school children in Pakistan at primary school age is 60 percent. The adult illiteracy rate, encompassing individuals aged 15 years and above, is 46 percent, positioning it as the fifth highest in the Asian region and the seventeenth highest worldwide (Coleman, 2010).

4.5.4 Issues and Challenges in Language Planning

According to Aly (2007) a white Paper on education in Pakistan recommends that English be utilized as the medium of instruction for all university and college lessons in sciences and technology. The existing literature has established that the adverse effects of employing English as the instructive medium in Pakistan's subject classrooms have been

extensively documented (Brock-Utne, 2005; Tsui & Tollefson, 2004). Utilizing English as the primary medium of instruction in multilingual settings, such as in Pakistan, can potentially result in unfavourable outcomes, including the "linguistic genocide" of other native languages (Brock-Utne, 2001a; Skutnabb-Kangas, 2006). Additionally, acquiring concepts in English, frequently the third or fourth language for children in Pakistan, may result in cognitive and educational implications. Research has demonstrated that utilizing a language other than the mother language as the instruction is crucial in attaining high-quality education throughout their learning experience (Nekatibeb, 2007). In Pakistan, children attend non-elite private schools that offer instruction in English or public schools that provide instruction in Urdu. In these settings, teachers often possess limited expertise in English and may restrict the practice of English as a means of conversation within the classroom. The situation is exacerbated by the fact that in such educational institutions, where both the instructors and the learners have limited proficiency in English, the pedagogues promote “rote learning” of concepts (Shamim, 2008). The phenomenon of "devoicing" among students, as described by (Ramanathan, 2005), has the potential to result in decreased literacy levels rather than an improvement in educational standards.

Research has illustrated that utilizing the mother language as an instructive medium is the most optimal approach for children's learning, as it leads to improved learning outcomes, social development, self-assurance, and critical thinking abilities. The literature has proved that early education in a child's native language can benefit their development. Children's acquisition of fundamental concepts is more efficient when conducted in their native language, as there are no hindrances to comprehension. For various reasons, educating children in a language unfamiliar to them has significant repercussions, particularly during the initial years of primary school (Tikly & Barrett, 2011).

The probability of children remaining in school is significantly lower when their native language is not utilized. According to a survey conducted across 22 countries, which analyzed data from approximately 160 language groups, it was observed that the primary language spoken by an individual's mother had a significant impact on their educational attendance in nearly all countries, which remained consistent after controlling for variables such as socioeconomic status and gender. The survey also revealed that half of the world's out-of-school children reside in communities where the language used for schooling is seldom spoken at home. As a result, this presents a significant obstacle in attaining the objective of Education for All (EFA), as it is accompanied by a history of unproductive

methodologies that result in reduced educational achievements and elevated rates of student dropouts and repetition of grades (Gove & Cvelich, 2011).

Another negative consequence of providing education in a language that is not mutually understandable between teachers and students is the anticipated decrease in overall academic achievement levels. The observation that language policy decisions in education are seldom informed by evidence of this nature holds considerable significance. Using a language for instructional purposes in the school curriculum appears to hurt the academic performance of individuals who do not have access to it in their home setting, particularly those who do not have consistent exposure to it outside of the school environment.

Based on empirical evidence collected through international assessments of learning outcomes, it has been observed that students not taught in their mother language are susceptible to a significant decline in their academic performance when they continue their studies. The existing research on children's language acquisition asserts that acquiring an unfamiliar language during preschool and primary years can be difficult for children, which holds particularly true when individuals face additional educational challenges, such as poor living conditions, food insecurity, and inadequate educational resources. According to pedagogical research, knowledge acquisition in children involves establishing connections between newly introduced information and pre-existing cognitive structures; hence, unexpected shifts to an unfamiliar language impede the establishment of those linkages.

Moreover, employing a foreign language in the initial stages of education results in potential constraints on children's proficiency in said language, which lacks justification. However, assuming all other factors remain constant, it is probable that children first acquire fundamental literacy skills in their mother language and subsequently receive instruction in a foreign language non-native language. Furthermore, another adverse outcome of teaching a child in a non-native language has far-reaching implications; for instance, excluding linguistic communities from educational opportunities has the potential for political instability and conflict. A comprehension of the advantages of mother language instruction and the potential drawbacks of education in a non-native language can facilitate our comprehension of some of Pakistan's challenges. For instance, government schools employ Urdu as the primary mode of instruction; nonetheless, only 6.8 percent of the

population has Urdu as their mother language. However, it is noteworthy that a small fraction primarily speaks English of the privileged population in Pakistan. It is used as the primary mode of instruction in elite and non-elite private schools (Shamim, 2008).

It can be inferred that education in the mother language is not readily available to most children in Pakistan, with an estimated proportion of around 95 percent. According to a recent study, a significant majority of 91.6 percent of school children are not allowed to pursue their education in their mother language. In Pakistan, many children are not enrolled in educational institutions, and the dropout rates are high. In contrast, the survival rate from primary to secondary education is relatively low, linked to inconsistent mother language in educational contexts. It has been reported that when education is delivered in a language unfamiliar to children, it results in substandard educational performance in elementary schools. Non-elite private schools exhibit marginally superior outcomes, which may be attributed to the comparatively more excellent resources and time their instructors spend in instructional settings than their public school counterparts (Nurmaliyah et al., 2023).

Significant research published by CfBT and Save the Children highlighted the potential vulnerability of Pakistan in the absence of a concentrated effort towards adopting education based on the mother language. Pakistan is among the 44 nations with a significant proportion of the population lacking access to education in their native language, which exhibits a high probability of low academic achievement. Additionally, Pakistan is classified as one of the 34 nations with a large rural population, and it is distinguished as one of the 19 countries exhibiting high linguistic fractionalization levels (Haidar & Manan, 2021). Consequently, an accompanying threat exists that unsuitable language in education may foster enduring political, societal, and financial instability and create divisions based on linguistic and ethnic factors. Pakistan is reported as the 11th nation that exhibits higher levels of conflict, posing a significant risk of language policy having profound implications on the already uncertain Situation. The analysis findings suggest that nations characterized by linguistic and ethnic cleavages and elevated levels of instability necessitate thorough concentration of their language-related educational policies and procedures (Shamim & Rashid, 2019).

4.5.5 Issues and Challenges in Language in Education Policy Implementation

The execution of the current language in education policy in Pakistan might be influenced by various factors, such as the significant socioeconomic disparities evident in the Urdu- and English-medium educational paths within the country's education system, the absence of a cohesive implementation strategy with enduring provisions, and the dearth of an articulated national language policy. This section provided a concise overview of the factors above. As noted earlier, there is considerable heterogeneity among schools in Pakistan concerning their language in education as English and the provision of resources, including human capital, allocated towards the facilitation of teaching and learning (Rahman, 1995, 2005). As previously discussed, the signal from various colonial states, including Pakistan, directed the implementation of teaching and learning using English as the medium of instruction, a language in which teachers and students possess inefficient skills.

Therefore, a key challenge is to provide equal chances for teaching English to the students studying in Urdu medium, i.e., public schools, and English-medium, i.e., non-elite private schools in Pakistan, as is presented to the students in elite English-medium schools. Second, language acquisition planning in education does not have a shared execution plan with sustainable schemes (Cooper, 1989). It is recognized that the successful implementation of language education policies depicts that the Federal Ministry of Education is responsible for most of the work, such as curriculum development (Kaplan & Baldauf, 1997).

As externally "imposed" donor-funded schemes in Pakistan have historically not been sustainable (Shamim, 2008), the current actions for implementing the new curriculum should perhaps be implemented immediately. Consequently, one of the obstacles to the successful implementation of policy in Pakistan's school education is the development of sustainable schemes shared across the three administrative and decision-creating levels – federal, provincial, and district. Third, the existing language in education policy is not part of a national language policy; instead, it consists primarily of government officials' statements, periodic government notifications, and counselling documents, which could separate, and unequal implementation struggles at various education levels in Pakistan. Therefore, the importance of a defined language in education within a national policy framework cannot be overstated (Aly, 2007).

Developing an extensively acknowledged national language policy in Pakistan's multilingual context imposes a significant dare on current and upcoming governments, as language hierarchies are frequently connected to supremacy connections in such situations (Arthur, 2001). The preceding discussion necessitates that a global orientation to English without an affiliated change in the disparity of children's educational opportunities in different school types, and in the absence of shared and sustainable implementation schemes located within an explicitly defined language policy, may result in an increase in illiteracy rather than an increase in English literacy for instance, to many African and Indian nations, where the medium of instruction becomes an additional cause of school failure (Annamalai, 2004).

4.6 Conclusion and Policy Recommendations

The preceding analysis demonstrates that, despite our independence from the Hindus and the English, we could never be free of colonialism. The ruling class and their interests never allowed Pakistan to meet its own needs independently. Currently, the nation faces neocolonialism, industrial imperialism, and its education system; after 75 years of independence, Pakistan’s education system cannot foster patriotism; however, colonialism continues to exert its influence. Pakistan's class-based education system implies polarization according to socioeconomic class (Rahman, 2004). Short-term educational and long-term socioeconomic outcomes are entirely different for each socioeconomic group acquiring education. For example, Islamic Madaris attracts low-income students who cannot receive an education. Similarly, the working and middle classes prefer public and non-elite private education, whereas Urdu is the language used for schooling. Elite private schools provide privileges and advantages to the elite and promote English medium instructions spoken by a tiny ruling elite in the country.

It is established that language in education is responsible for Pakistan's class-based education system, where opportunities are concentrated among a small English-speaking elite. On the international level, however, it is argued that a medium of instruction other than the mother language is a significant barrier to attaining quality education throughout the entire learning process (Nekatibeb, 2007). Because children interact with one another, the games they play could be incorporated into the classroom setting. Children can understand effectively in the language they speak because comprehension and cognition can only be developed through mother language instructions. Moreover, children are more

likely to learn a foreign language successfully if they become literate in their native language first. As a result, parents may be capable of monitoring and contributing to their children's education. Parents not only reinforce what is occurring at school, but they can also feel indulged in their children's school development.

Content analysis of education and language planning, it is concluded that the language and education planning is inconsistent. It is imperative to establish the nation's language of instruction unanimously so that the Contribution of language policies to economic productivity can be analyzed in detail. Concerning the friction between Urdu, English, and other regional languages, there is a repeated imperative to advocate for the attainment of 'universal literacy' in one's mother language rather than considering one language at the expense of the other. The proposition is for education policies to adopt the concept of 'multilingualism,' leveraging indigenous resources to strengthen the establishment of Pakistan's national identity, which might be responsive to recognizing regional languages in formal education.

Incorporating mother language instruction within the educational framework offers the potential to reduce the high incidence of poor academic performance among students in Pakistan. By prioritizing and promoting making use of students' mother languages in the educational setting, students from diverse linguistic backgrounds can have equitable access to education, consequently eradicating the language obstacle that underprivileged students often encounter when studying in a language with which they are not proficient, such as Urdu or English. Providing education in students' mother language could improve their understanding and engagement with the curriculum and result in enhanced academic achievements. The available empirical data suggests that mother language instruction improves students' comprehension of complex concepts more accurately.

The education system in Pakistan, which is structured around social class, frequently sustains disparities in educational opportunities. However, implementing mother language instruction facilitates accessibility for students from marginalized backgrounds who may lack proficiency in Urdu or English. This approach mitigates inequalities and promotes equity, providing students from diverse socioeconomic backgrounds equitable access to high-quality education. In addition, the provision of education in one's native language aids in the conservation of the cultural legacy of diverse linguistic groups in Pakistan.

Moreover, the study has concluded that class-based education systems demonstrate various disparities among the different socioeconomic classes, constituting the concentration of opportunities among the power elite, the English-speaking people. The Constitution (1973) ensures equality and well-being of all citizens and nodiscrimination in education based on sex, caste, or race. Introducing SNC in Urdu, i.e., Pakistan's national language, can eliminate the existing class-based education system. Promoting a fair and comprehensive educational atmosphere can be facilitated by implementing SNC in all educational institutions, irrespective of their public or private nature. SNC's implementation mitigates the discrepancies between public and private schools, thereby reducing the privileged position of students from high socioeconomic status attending private educational institutions. As a result, individuals from diverse socioeconomic backgrounds are afforded equal access to education of comparable quality. It is reasonable to develop SNC, which caters to the distinctive requirements of the Pakistani population, encompassing its linguistic, regional, and cultural heterogeneity. In addition, SNC implementation facilitates improved resource allocation by standardizing curriculum and teacher training and enhancing student mobility across educational institutions. In Pakistan, SNC has the potential to effectively eliminate the prevalent class-based education system, thereby ensuring equitable access to educational opportunities for all.

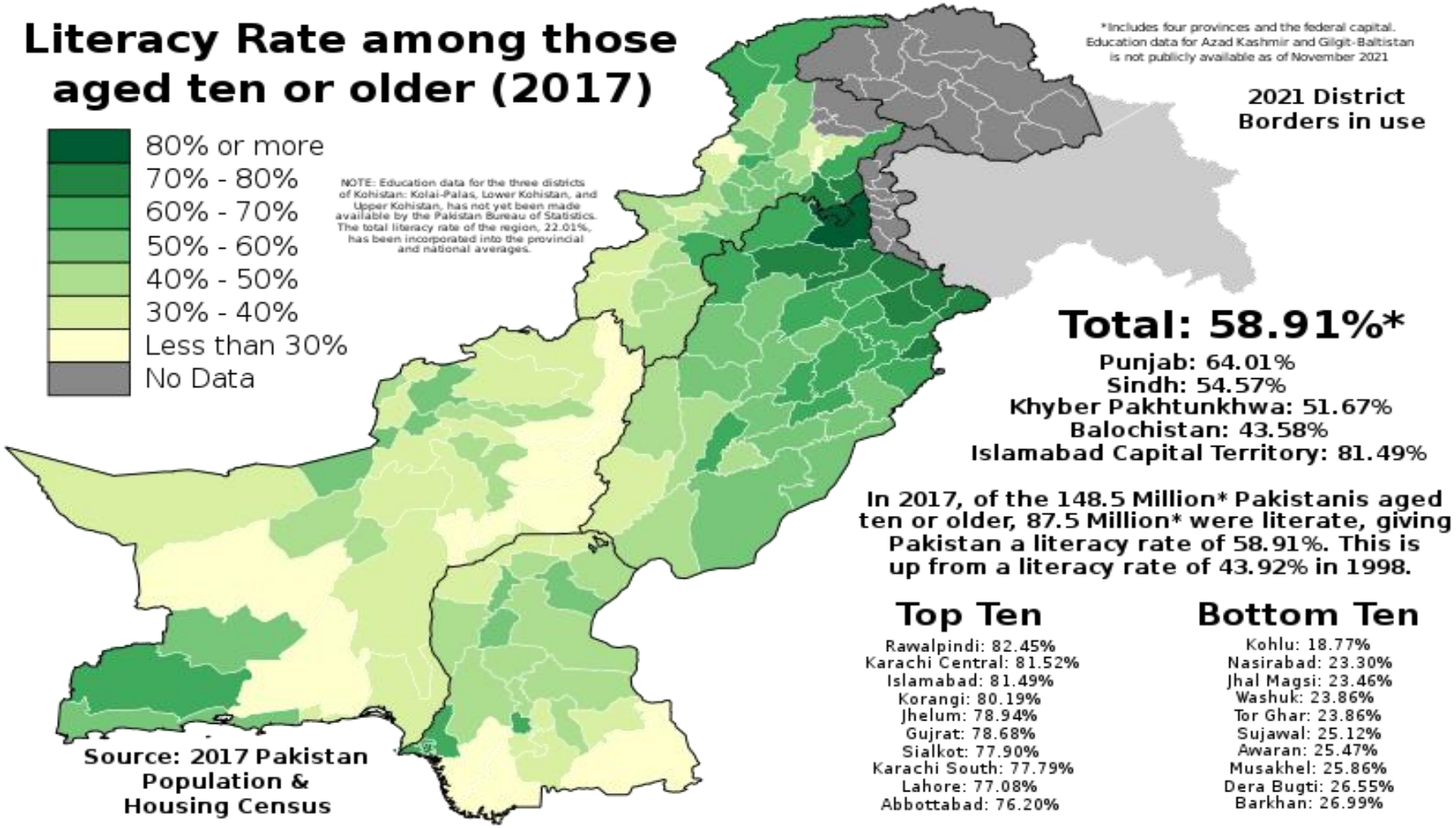
4.7 Study Limitations and Future Research Endeavors

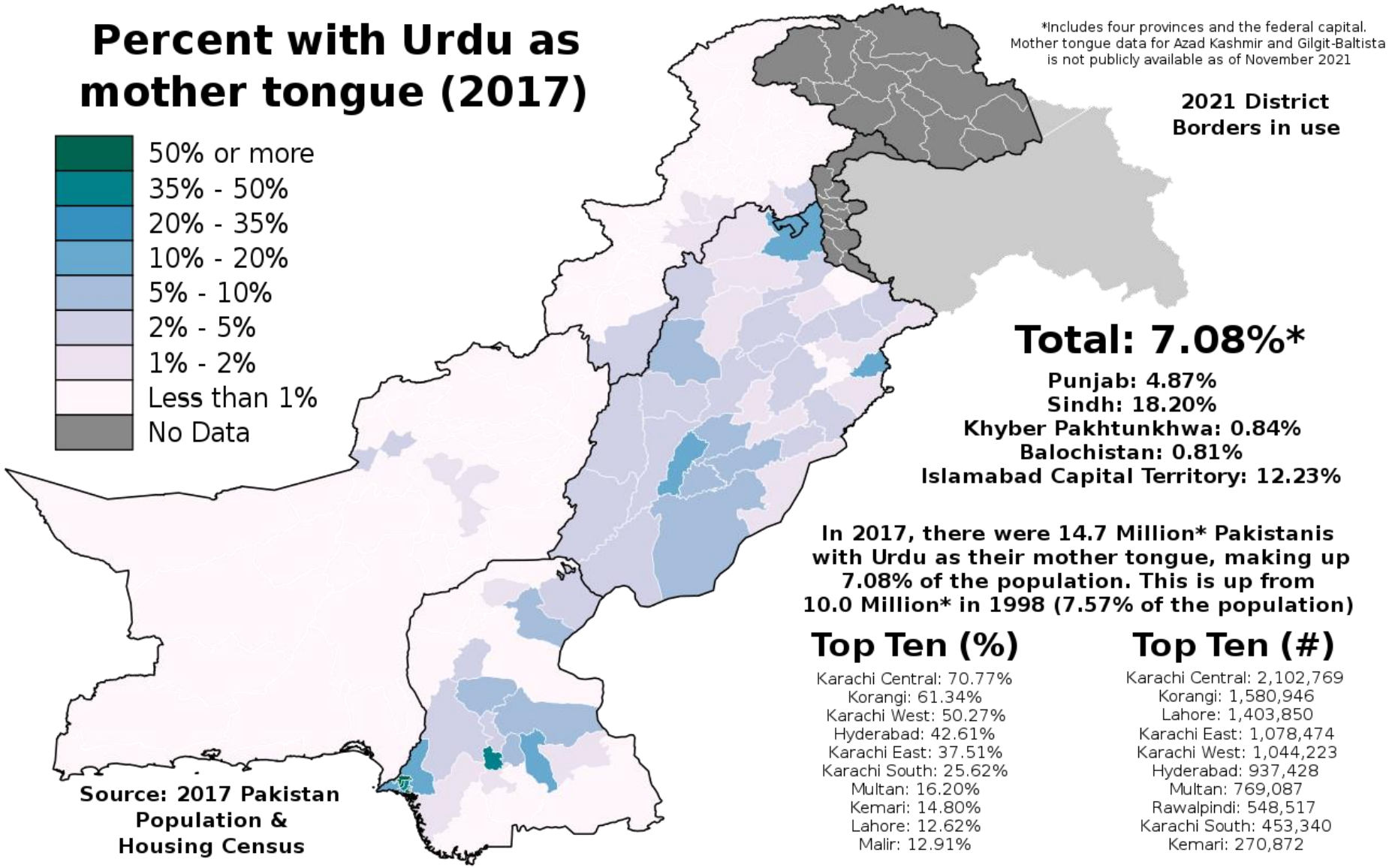
This study conducts a thematic analysis of language in educational policy in Pakistan since its independence in 1947. While the current analysis provides a basic understanding, there is room for a comparative study that may investigate the similarities and differences and the emergence of new themes and concepts in educational policy before and after independence.

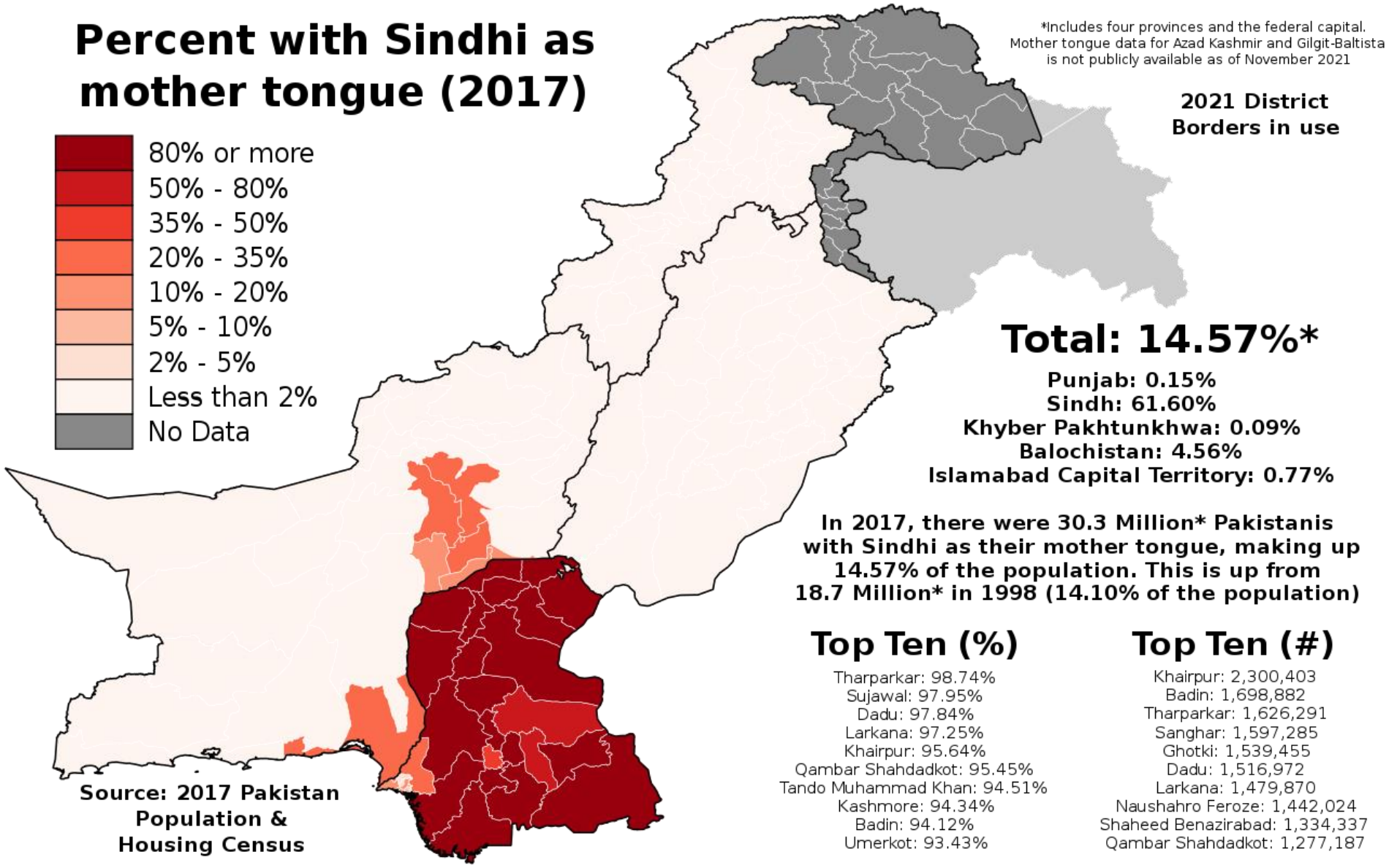
However, it is important to note that this study is limited because it relies solely on published material. A more comprehensive approach would include obtaining ethical research approval from the relevant institutions. This would allow for a more in-depth investigation of individual perspectives on class-based education issues within Pakistan's educational system. It would also allow for a more in-depth examination of how language in education policies shapes individuals' economic, political, and social interests across different classes and vice versa.

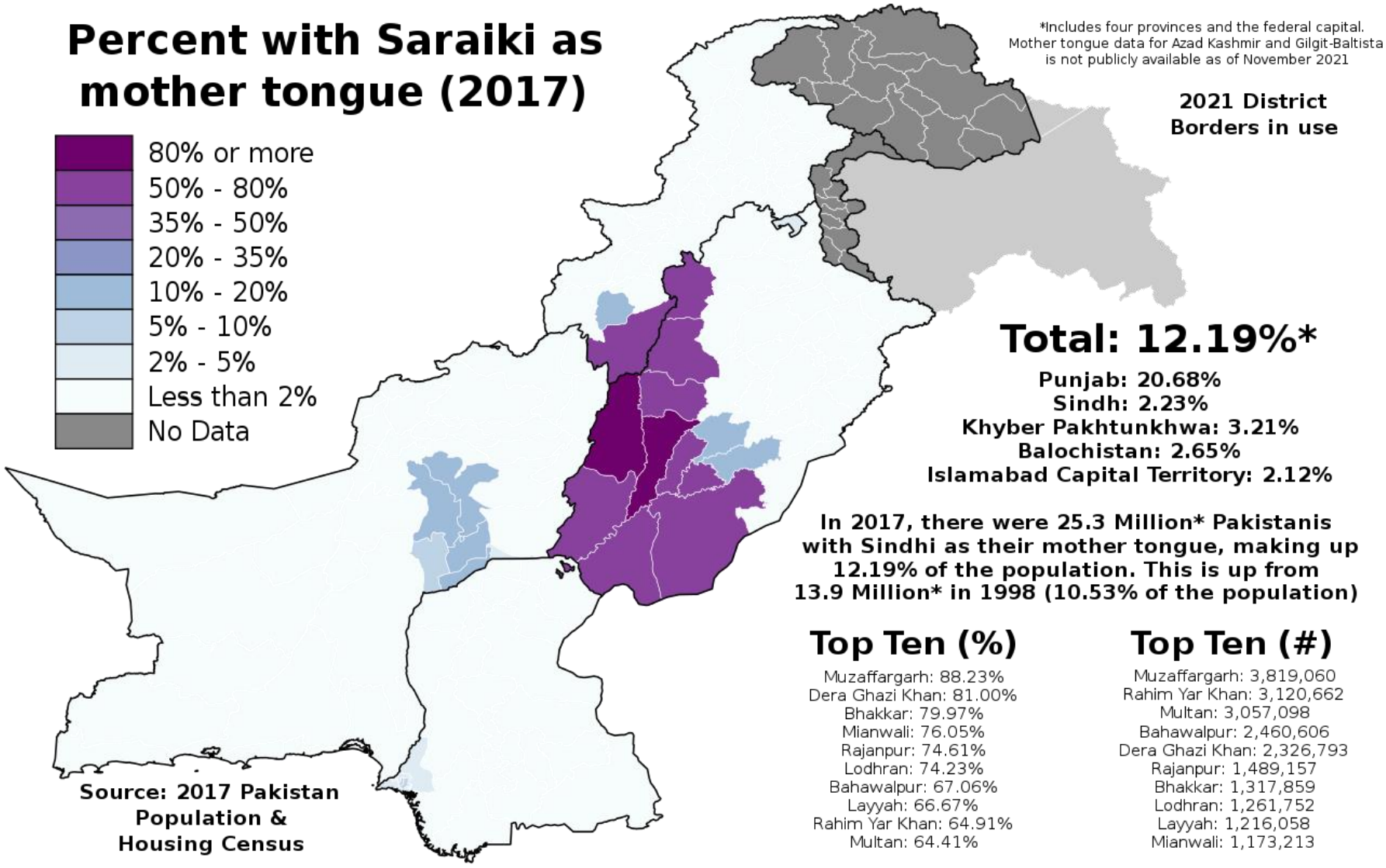
Many ongoing research paths exist, but I will now conclude my recommendations.

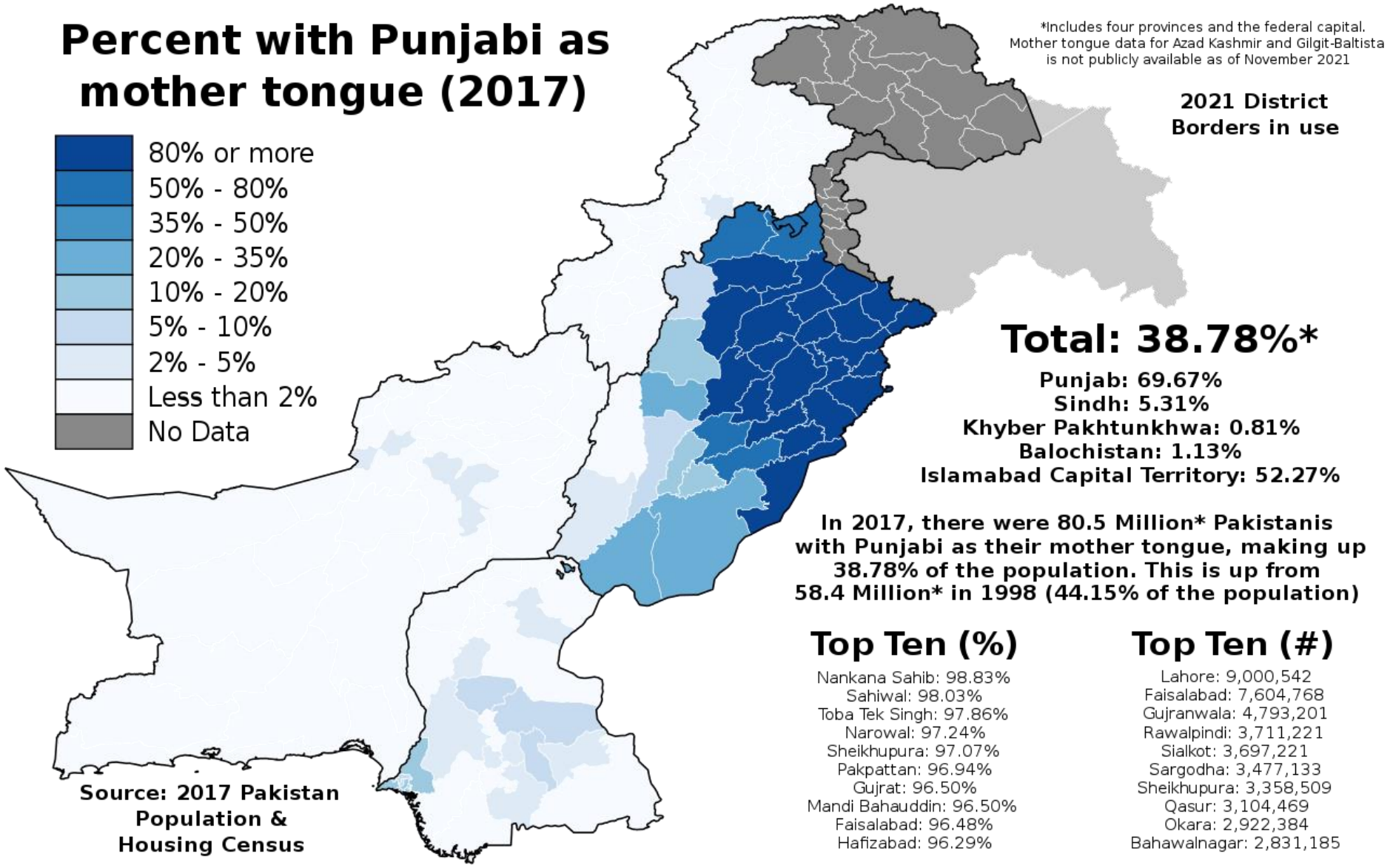
4.8 Appendix 4

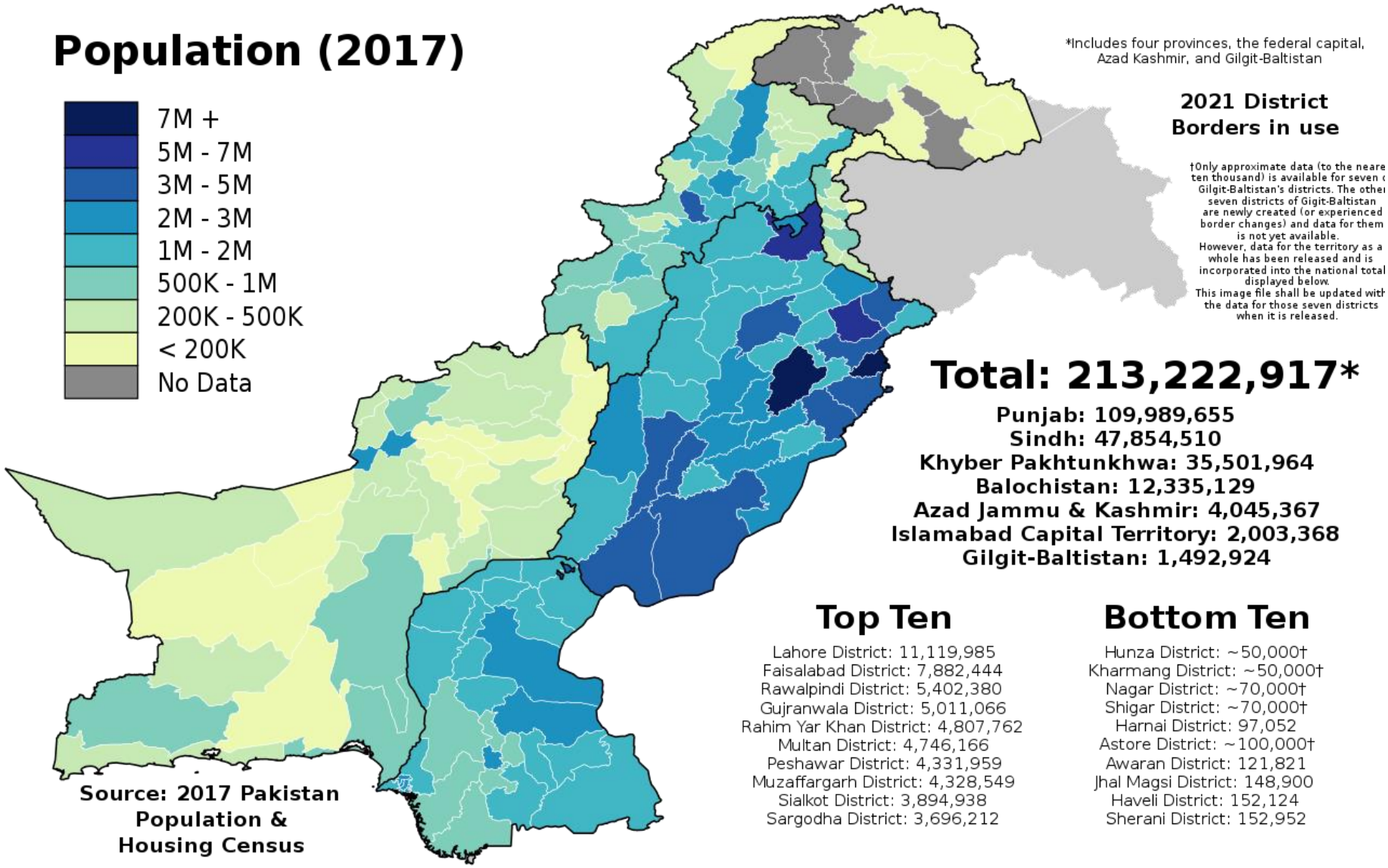


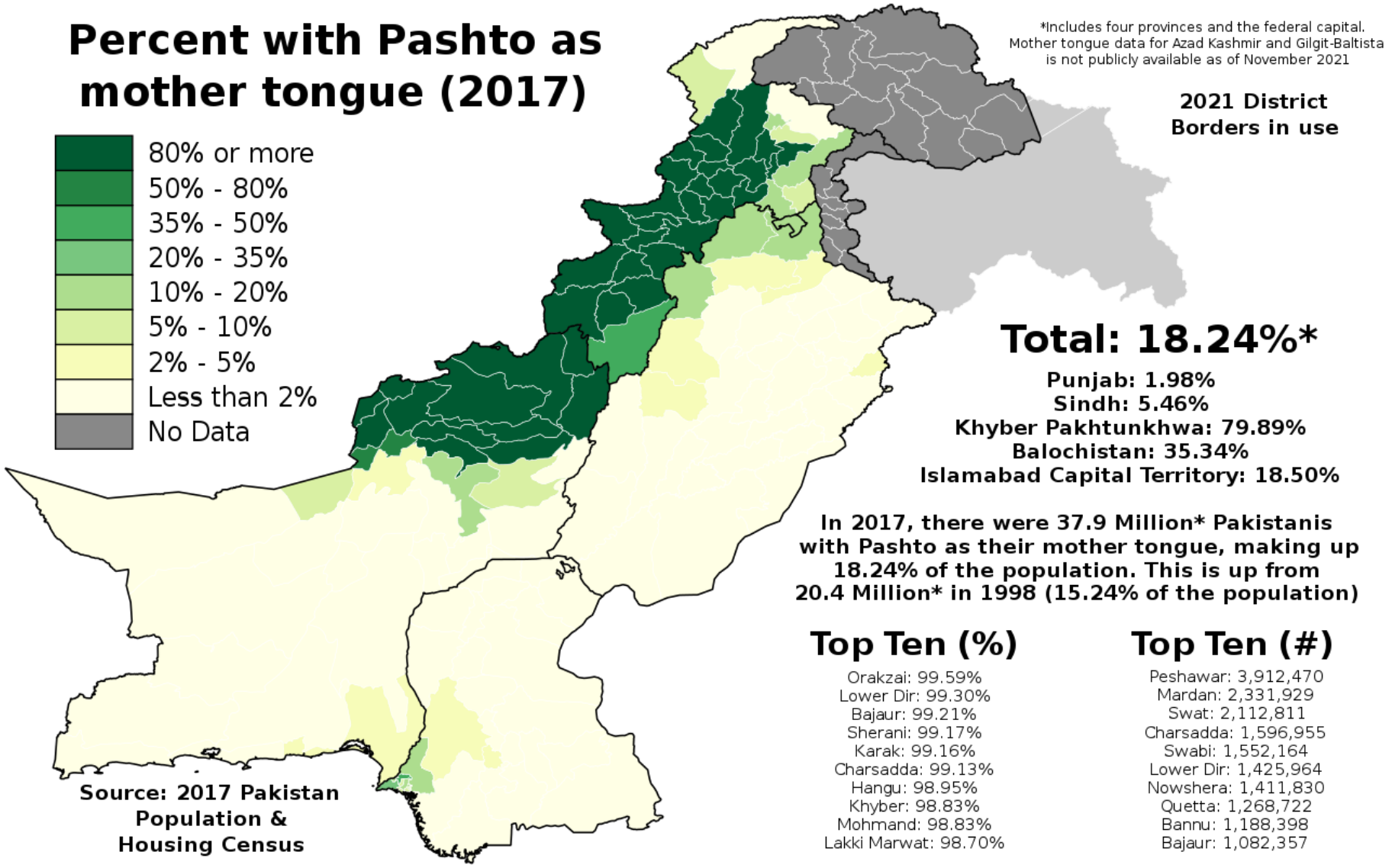

Percent with Urdu as mother tongue (2017)
50% or more
35% - 50%
20% - 35%
10% - 20%
5% - 10%
2% - 5%
1% - 2%
Less than 1%
No Data
*Includes four provinces and the federal capital.
Mother tongue data for Azad Kashmir and Gilgit-Baltista is not publicly available as of November 2021
2021 District Borders in use
Total: 7.08%*
Punjab: 4.87%
Sindh: 18.20%
Khyber Pakhtunkhwa: 0.84%
Balochistan: 0.81%
Islamabad Capital Territory: 12.23%
In 2017, there were 14.7 Million* Pakistanis with Urdu as their mother tongue, making up 7.08% of the population. This is up from 10.0 Million* in 1998 (7.57% of the population)
Top Ten (%)
Karachi Central: 70.77%
Korangi: 61.34%
Karachi West: 50.27%
Hyderabad: 42.61%
Karachi East: 37.51%
Karachi South: 25.62%
Multan: 16.20%
Kemari: 14.80%
Lahore: 12.62%
Malir: 12.91%
Top Ten (#)
Karachi Central: 2,102,769
Korangi: 1,580,946
Lahore: 1,403,850
Karachi East: 1,078,474
Karachi West: 1,044,223
Hyderabad: 937,428
Multan: 769,087
Rawalpindi: 548,517
Karachi South: 453,340
Kemari: 270,872
Source: 2017 Pakistan Population & Housing Census

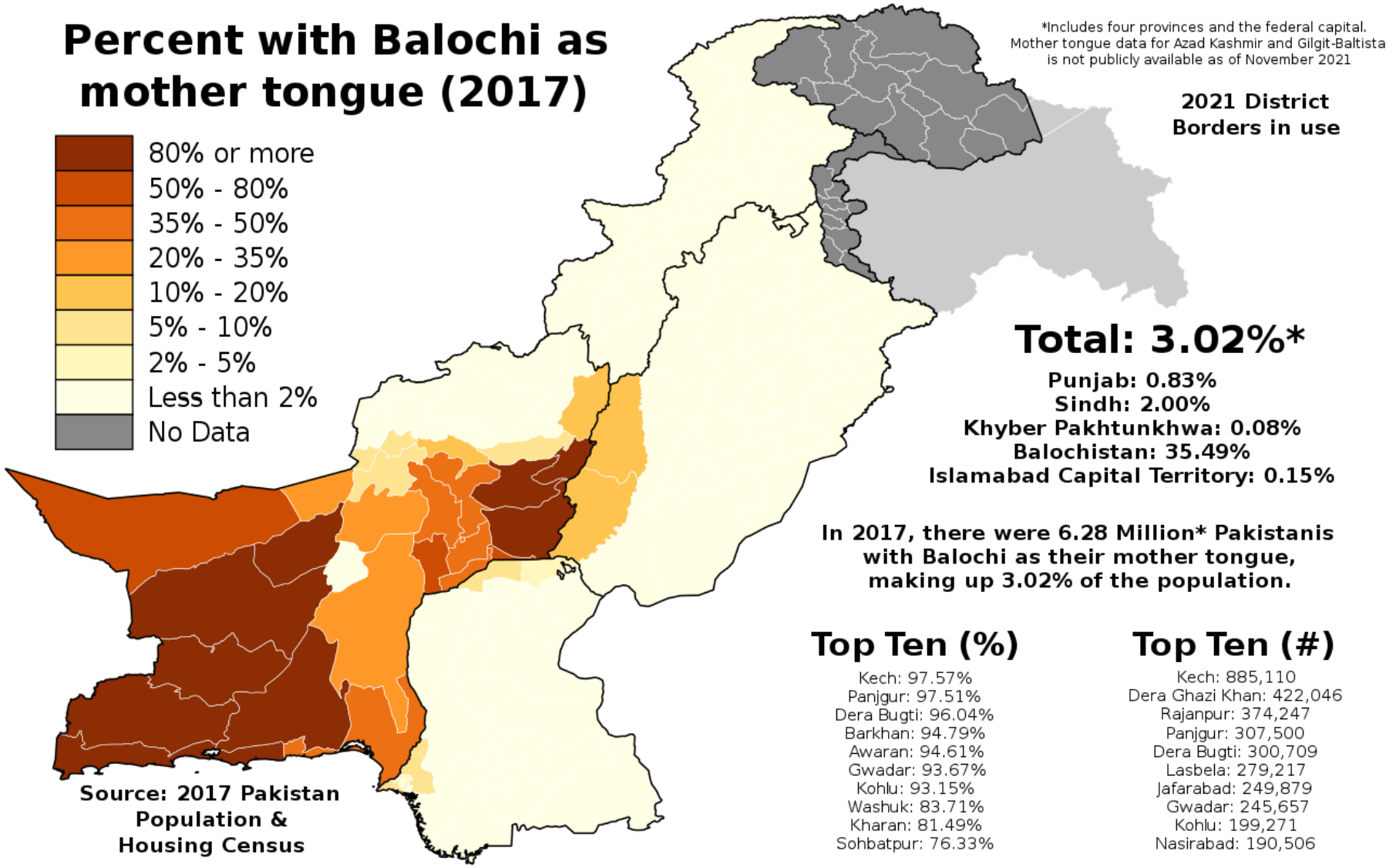

Percent with Sindhi as mother tongue (2017)
80% or more
50% - 80%
35% - 50%
20% - 35%
10% - 20%
5% - 10%
2% - 5%
Less than 2%
No Data
*Includes four provinces and the federal capital.
Mother tongue data for Azad Kashmir and Gilgit-Baltista is not publicly available as of November 2021
2021 District Borders in use
Total: 14.57%*
Punjab: 0.15%
Sindh: 61.60%
Khyber Pakhtunkhwa: 0.09%
Balochistan: 4.56%
Islamabad Capital Territory: 0.77%
In 2017, there were 30.3 Million* Pakistanis with Sindhi as their mother tongue, making up 14.57% of the population. This is up from 18.7 Million* in 1998 (14.10% of the population)
Top Ten (%)
Tharparkar: 98.74%
Sujawal: 97.95%
Dadu: 97.84%
Larkana: 97.25%
Khairpur: 95.64%
Qambar Shahdadkot: 95.45%
Tando Muhammad Khan: 94.51%
Kashmore: 94.34%
Badin: 94.12%
Umerkot: 93.43%
Top Ten (#)
Khairpur: 2,300,403
Badin: 1,698,882
Tharparkar: 1,626,291
Sanghar: 1,597,285
Ghotki: 1,539,455
Dadu: 1,516,972
Larkana: 1,479,870
Naushahro Feroze: 1,442,024
Shaheed Benazirabad: 1,334,337
Qambar Shahdadkot: 1,277,187
Source: 2017 Pakistan Population & Housing Census


Percent with Saraiki as mother tongue (2017)
80% or more
50% - 80%
35% - 50%
20% - 35%
10% - 20%
5% - 10%
2% - 5%
Less than 2%
No Data
*Includes four provinces and the federal capital.
Mother tongue data for Azad Kashmir and Gilgit-Baltista is not publicly available as of November 2021
2021 District Borders in use
Total: 12.19%*
Punjab: 20.68%
Sindh: 2.23%
Khyber Pakhtunkhwa: 3.21%
Balochistan: 2.65%
Islamabad Capital Territory: 2.12%
In 2017, there were 25.3 Million* Pakistanis with Sindhi as their mother tongue, making up 12.19% of the population. This is up from 13.9 Million* in 1998 (10.53% of the population)
Top Ten (%)
Muzaffargarh: 88.23%
Dera Ghazi Khan: 81.00%
Bhakkar: 79.97%
Mianwali: 76.05%
Rajanpur: 74.61%
Lodhran: 74.23%
Bahawalpur: 67.06%
Layyah: 66.67%
Rahim Yar Khan: 64.91%
Multan: 64.41%
Top Ten (#)
Muzaffargarh: 3,819,060
Rahim Yar Khan: 3,120,662
Multan: 3,057,098
Bahawalpur: 2,460,606
Dera Ghazi Khan: 2,326,793
Rajanpur: 1,489,157
Bhakkar: 1,317,859
Lodhran: 1,261,752
Layyah: 1,216,058
Mianwali: 1,173,213
Source: 2017 Pakistan Population & Housing Census


Percent with Punjabi as mother tongue (2017)
80% or more
50% - 80%
35% - 50%
20% - 35%
10% - 20%
5% - 10%
2% - 5%
Less than 2%
No Data
*Includes four provinces and the federal capital.
Mother tongue data for Azad Kashmir and Gilgit-Baltista is not publicly available as of November 2021
2021 District Borders in use
Total: 38.78%*
Punjab: 69.67%
Sindh: 5.31%
Khyber Pakhtunkhwa: 0.81%
Balochistan: 1.13%
Islamabad Capital Territory: 52.27%
In 2017, there were 80.5 Million* Pakistanis with Punjabi as their mother tongue, making up 38.78% of the population. This is up from 58.4 Million* in 1998 (44.15% of the population)
Top Ten (%)
Nankana Sahib: 98.83%
Sahiwal: 98.03%
Toba Tek Singh: 97.86%
Narowal: 97.24%
Sheikhupura: 97.07%
Pakpattan: 96.94%
Gujrat: 96.50%
Mandi Bahauddin: 96.50%
Faisalabad: 96.48%
Hafizabad: 96.29%
Top Ten (#)
Lahore: 9,000,542
Faisalabad: 7,604,768
Gujranwala: 4,793,201
Rawalpindi: 3,711,221
Sialkot: 3,697,221
Sargodha: 3,477,133
Sheikhupura: 3,358,509
Qasur: 3,104,469
Okara: 2,922,384
Bahawalnagar: 2,831,185
Source: 2017 Pakistan Population & Housing Census

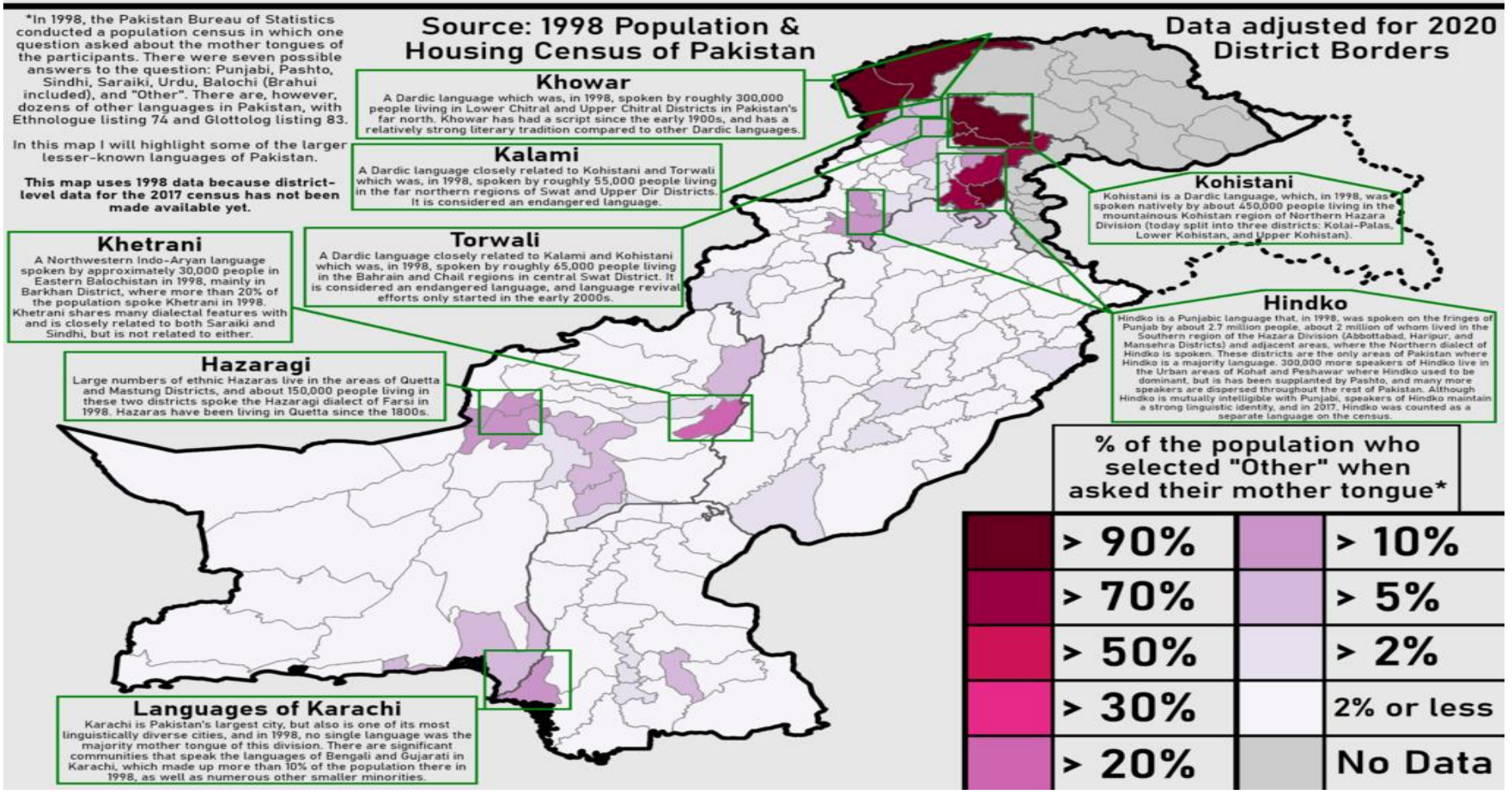

Population (2017)
7M +
5M - 7M
3M - 5M
2M - 3M
1M - 2M
500K - 1M
200K - 500K
< 200K
No Data
*Includes four provinces, the federal capital, Azad Kashmir, and Gilgit-Baltistan
2021 District Borders in use
†Only approximate data (to the neare ten thousand) is available for seven Gilgit-Baltistan's districts. The othe seven districts of Gigit-Baltistan are newly created (or experienced border changes) and data for them is not yet available.
However, data for the territory as a whole has been released and is incorporated into the national total displayed below.
This image file shall be updated with the data for those seven districts when it is released.
Total: 213,222,917*
Punjab: 109,989,655
Sindh: 47,854,510
Khyber Pakhtunkhwa: 35,501,964
Balochistan: 12,335,129
Azad Jammu & Kashmir: 4,045,367
Islamabad Capital Territory: 2,003,368
Gilgit-Baltistan: 1,492,924
Top Ten
Lahore District: 11,119,985
Faisalabad District: 7,882,444
Rawalpindi District: 5,402,380
Gujranwala District: 5,011,066
Rahim Yar Khan District: 4,807,762
Multan District: 4,746,166
Peshawar District: 4,331,959
Muzaffargarh District: 4,328,549
Sialkot District: 3,894,938
Sargodha District: 3,696,212
Bottom Ten
Hunza District: ~50,000†
Kharmang District: ~50,000†
Nagar District: ~70,000†
Shigar District: ~70,000†
Harnai District: 97,052
Astore District: ~100,000†
Awaran District: 121,821
Jhal Magsi District: 148,900
Haveli District: 152,124
Sherani District: 152,952
Source: 2017 Pakistan Population & Housing Census

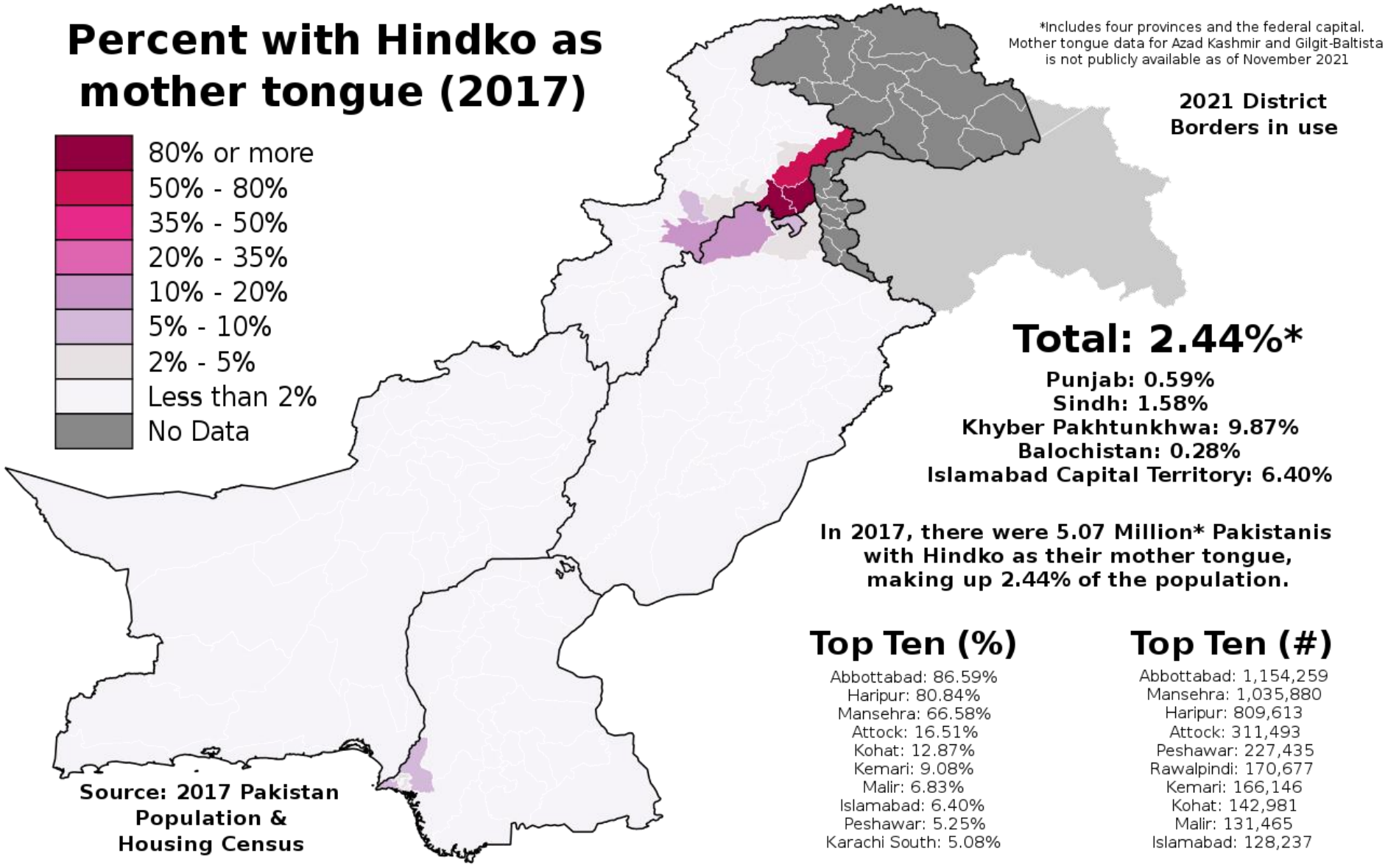

Percent with Pashto as mother tongue (2017)
80% or more
50% - 80%
35% - 50%
20% - 35%
10% - 20%
5% - 10%
2% - 5%
Less than 2%
No Data
*Includes four provinces and the federal capital.
Mother tongue data for Azad Kashmir and Gilgit-Baltista is not publicly available as of November 2021
2021 District Borders in use
Total: 18.24%*
Punjab: 1.98%
Sindh: 5.46%
Khyber Pakhtunkhwa: 79.89%
Balochistan: 35.34%
Islamabad Capital Territory: 18.50%
In 2017, there were 37.9 Million* Pakistanis with Pashto as their mother tongue, making up 18.24% of the population. This is up from 20.4 Million* in 1998 (15.24% of the population)
Top Ten (%)
Orakzai: 99.59%
Lower Dir: 99.30%
Bajaur: 99.21%
Sherani: 99.17%
Karak: 99.16%
Charsadda: 99.13%
Hangu: 98.95%
Khyber: 98.83%
Mohmand: 98.83%
Lakki Marwat: 98.70%
Top Ten (#)
Peshawar: 3,912,470
Mardan: 2,331,929
Swat: 2,112,811
Charsadda: 1,596,955
Swabi: 1,552,164
Lower Dir: 1,425,964
Nowshera: 1,411,830
Quetta: 1,268,722
Bannu: 1,188,398
Bajaur: 1,082,357
Source: 2017 Pakistan Population & Housing Census


Percent with Balochi as mother tongue (2017)
80% or more
50% - 80%
35% - 50%
20% - 35%
10% - 20%
5% - 10%
2% - 5%
Less than 2%
No Data
*Includes four provinces and the federal capital.
Mother tongue data for Azad Kashmir and Gilgit-Baltista is not publicly available as of November 2021
2021 District Borders in use
Total: 3.02%*
Punjab: 0.83%
Sindh: 2.00%
Khyber Pakhtunkhwa: 0.08%
Balochistan: 35.49%
Islamabad Capital Territory: 0.15%
In 2017, there were 6.28 Million* Pakistanis with Balochi as their mother tongue, making up 3.02% of the population.
Top Ten (%)
Kech: 97.57%
Panjgur: 97.51%
Dera Bugti: 96.04%
Barkhan: 94.79%
Awaran: 94.61%
Gwadar: 93.67%
Kohlu: 93.15%
Washuk: 83.71%
Kharan: 81.49%
Sohbatpur: 76.33%
Top Ten (#)
Kech: 885,110
Dera Ghazi Khan: 422,046
Rajanpur: 374,247
Panjgur: 307,500
Dera Bugti: 300,709
Lasbela: 279,217
Jafarabad: 249,879
Gwadar: 245,657
Kohlu: 199,271
Nasirabad: 190,506
Source: 2017 Pakistan Population & Housing Census

The other languages of Pakistan*

ALL LANGUAGES EXCEPT PUNJABI, PASHTO, SINDHI, SARAIKI, URDU, BALOCHI, and BRAHUI




Percent with Hindko as mother tongue (2017)
80% or more
50% - 80%
35% - 50%
20% - 35%
10% - 20%
5% - 10%
2% - 5%
Less than 2%
No Data
*Includes four provinces and the federal capital.
Mother tongue data for Azad Kashmir and Gilgit-Baltista is not publicly available as of November 2021
2021 District Borders in use
Total: 2.44%*
Punjab: 0.59%
Sindh: 1.58%
Khyber Pakhtunkhwa: 9.87%
Balochistan: 0.28%
Islamabad Capital Territory: 6.40%
In 2017, there were 5.07 Million* Pakistanis with Hindko as their mother tongue, making up 2.44% of the population.
Top Ten (%)
Abbottabad: 86.59%
Haripur: 80.84%
Mansehra: 66.58%
Attock: 16.51%
Kohat: 12.87%
Kemari: 9.08%
Malir: 6.83%
Islamabad: 6.40%
Peshawar: 5.25%
Karachi South: 5.08%
Top Ten (#)
Abbottabad: 1,154,259
Mansehra: 1,035,880
Haripur: 809,613
Attock: 311,493
Peshawar: 227,435
Rawalpindi: 170,677
Kemari: 166,146
Kohat: 142,981
Malir: 131,465
Islamabad: 128,237
Source: 2017 Pakistan Population & Housing Census

4.9 References

Aaron, H., & McGuire, M. (1970). Public goods and income distribution. *Econometrica: Journal of the Econometric Society*, 907-920.

Abdel-Aty, M. A., & Radwan, A. E. (2000). Modeling traffic accident occurrence and involvement. *Accident Analysis & Prevention, 32*(5), 633-642.

Ablo, E., & Reinikka, R. (1998). Do budgets really matter? Evidence from public spending on education and health in Uganda. *Evidence from Public Spending on Education and Health in Uganda (June 1998)*.

Agirdag, O., Demanet, J., Van Houtte, M., & Van Avermaet, P. (2011). Ethnic school composition and peer victimization: A focus on the interethnic school climate. *International Journal of Intercultural Relations, 35*(4), 465-473.

Ahmad, N., & Guijun, Z. (2022). Inclusion or exclusion: Language ideology and language-in-education policies in Pakistan. *European Journal of Language Policy, 14*(2), 181-203.

Ahmed, M., Shuai, C., Abbas, K., Rehman, F. U., & Khoso, W. M. (2022). Investigating health impacts of household air pollution on woman's pregnancy and sterilization: Empirical evidence from Pakistan, India, and Bangladesh. *Energy, 247*, 123562.

Ahuja, D., & Pandit, D. (2022). Social spending as a development tool: evidence from developing countries. *European Journal of Government and Economics, 11*(1), 73-96.

Airey, J. (2009). *Science, language, and literacy: Case studies of learning in Swedish university physics.* Acta Universitatis Upsaliensis,

Ajwad, M. I., & Wodon, Q. (2002). Who benefits from increased access to public services at the local level? A marginal benefit incidence analysis for education and basic infrastructure.

Akram, M., & Khan, F. J. (2007). *Health care services and government spending in Pakistan*. Retrieved from

Akujobi, O. S. (2019). Linguistic elitism and the conflict of ideologies: The African perspective. *PREORC Journal of Arts and Humanities, 4*(1), 61-85.

Alderman, H., Orazem, P. F., & Paterno, E. M. (2001). School quality, school cost, and the public/private school choices of low-income households in Pakistan. *Journal of human resources*, 304-326.

Alesina, A., Baqir, R., & Easterly, W. (1999). Public goods and ethnic divisions. *The quarterly journal of economics, 114*(4), 1243-1284.

Alesina, A., Baqir, R., & Easterly, W. (2000). Redistributive public employment. *Journal of Urban Economics, 48*(2), 219-241.

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth, 8*(2), 155-194.

Alesina, A., & Ferrara, E. L. (2005). Ethnic diversity and economic performance. *Journal of Economic Literature, 43*(3), 762-800.

Alesina, A., & Giuliano, P. (2015). Culture and institutions. *Journal of Economic Literature, 53*(4), 898-944.

Alesina, A., & La Ferrara, E. (2005). Ethnic diversity and economic performance. *Journal of Economic Literature, 43*(3), 762-800.

Alesina, A., Perotti, R., & Spolaore, E. (1995). Togetheror separately? Issues on the costs and benefits of political and fiscal unions. *European Economic Review, 39*(3-4), 751-758.

Alesina, A., & Spolaore, E. (1997). On the number and size of nations. *The quarterly journal of economics, 112*(4), 1027-1056.
Alesina, A. F., & Reich, B. (2015). Nation building.
Allen, K., Quinn, J., Hollingworth, S., & Rose, A. (2013). Becoming employable students and 'ideal'creative workers: exclusion and inequality in higher education work placements. *British Journal of Sociology of Education, 34*(3), 431-452.
Allison, P. D., & Waterman, R. P. (2002). Fixed–effects negative binomial regression models. *Sociological methodology, 32*(1), 247-265.
Allwright, D., & Bailey, K. M. (1991). *Focus on the language classroom*: Cambridge University Press.
Altbach, P. G. (2008). The imperial tongue: English as the dominating academic language. *International Educator, 17*(5), 56.
Alvaredo, F., Chancel, L., Piketty, T., Saez, E., & Zucman, G. (2018). *World inequality report 2018*: Belknap Press.
Aly, J. H. (2007). Education in Pakistan: A white paper (revised). *Documentation to Debate and Finalize the National Education Policy. Islamabad: Government of Pakistan, National Education Policy Review Team*.
Amakom, U. (2020). *Public spending and poverty reduction in Nigeria: A benefit incidence analysis in education and health.* AERC,
Amemiya, T. (1985). *Advanced econometrics*: Harvard university press.
Amin, B., Akram, M. B., Abbas, Z., & Iqbal, S. (2021). The State Of Education In Pakistan From 1947 To 2019: A Content Analysis Of The Three Selected English Newspapers Of Pakistan. *Ilkogretim Online, 20*(1), 6549-6559.
Amjad, R., & Kemal, A. R. (1997). Macroeconomic policies and their impact on poverty alleviation in Pakistan. *The Pakistan development review*, 39-68.
Anand, S., & Sen, A. (2000). Human development and economic sustainability. *World Development, 28*(12), 2029-2049.
Anbumozhi, V., Kalirajan, K., & Kimura, F. (2022). Introduction: Regional Catalysts for the Realisation of the SDGs in the Post Pandemic Era. In *Sustainable Development Goals and Pandemic Planning: Role of Efficiency Based Regional Approaches* (pp. 1-24): Springer.
Anderson, B. S. (2022). Endogeneity in strategic entrepreneurship research. In *Research Handbook on Strategic Entrepreneurship* (pp. 233-263): Edward Elgar Publishing.
Angelopoulos, K., Malley, J., & Philippopoulos, A. (2007). Public education expenditure, growth and welfare.
Anlimachie, M. A., & Avoada, C. (2020). Socio-economic impact of closing the rural-urban gap in pre-tertiary education in Ghana: context and strategies. *International Journal of Educational Development, 77*, 102236.
Annamalai, E. (2004). Medium of power: The question of English in education in India. *Medium of instruction policies: Which agenda? Whose agenda*, 177-194.
Anwar, J., Kelly, P., & Gray, E. (2022). Girls' education in Balochistan, Pakistan: exploring a postcolonial Islamic governmentality. *British Journal of Sociology of Education, 43*(3), 433-450.
Arnold, B. F., Ercumen, A., Benjamin-Chung, J., & Colford Jr, J. M. (2016). Brief report: negative controls to detect selection bias and measurement bias in epidemiologic studies. *Epidemiology (Cambridge, Mass.), 27*(5), 637.
Asante, A. D., Ir, P., Jacobs, B., Supon, L., Liverani, M., Hayen, A., . . . Wiseman, V. (2019). Who benefits from healthcare spending in Cambodia? Evidence for a universal health coverage policy. *Health policy and planning, 34*(Supplement_1), i4-i13.

Asghar, Z., & Zahra, M. (2012). A Benefit Incidence Analysis of Public Spending on Education in Pakistan Using PSLM Data. *Lahore Journal of Economics*, *17*(2).
Asif, M., Hayat, M., & Khan, S. (2021). Factors associated to high school students dropout in Malakand District Pakistan.
Auerbach, E. R. (1993). Reexamining English only in the ESL classroom. *Tesol Quarterly*, *27*(1), 9-32.
Awan, A. G., & Zia, A. (2015). Comparative Analysis of Public and Private Educational Institutions: A case study of District Vehari-Pakistan. *Journal of Education and Practice*, *6*(16), 122-130.
Ayres, J. (2003). " In the middle": Language Attitudes and Identity among Bilingual Hispanic-American College Students. *Céfiro: Enlace hispano cultural y literario*, *4*(1), 47-60.
Ball, J. (2010). Educational equity for children from diverse language backgrounds: mother tongue-based bilingual or multilingual education in the early years: summary.
Bamgbose, A. (1999). African language development and language planning. *Social dynamics*, *25*(1), 13-30.
Bamgbose, A. (2003). Language and the African renaissance: Lessons from the South African experience. *Tied tongues*, 39-60.
Bangay, C. (2005). Private education: Relevant or redundant? Private education, decentralisation and national provision in Indonesia. *Compare: A Journal of Comparative and International Education*, *35*(2), 167-179.
Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: Does the composition of the top team make a difference? *Strategic management journal*, *10*(S1), 107-124.
Barro, R. J. (1998). Human capital and growth in cross-country regressions. *Harvard University*.
Barro, R. J. (2002). Education as a determinant of economic growth.
Barro, R. J., & Lee, J.-W. (1994). *Sources of economic growth.* Paper presented at the Carnegie-Rochester conference series on public policy.
Barro, R. J., & Lee, J. W. (2001). International data on educational attainment: updates and implications. *oxford Economic papers*, *53*(3), 541-563.
Barro, R. J., & Lee, J. W. (2013). A new data set of educational attainment in the world, 1950–2010. *Journal of Development Economics*, *104*, 184-198.
Baumfield, V., & Mattick, K. (2016). Cost, value and quality in professional learning: Promoting economic literacy in medical and teacher education. *British Educational Research Association (BERA), London, UK. URL: https://www. bera. ac. uk/proje ct/cost-value-and-quali ty-in-profe fission al-learn ing-promo ting-econ o mic-liter acy-in-medic al-and-teach er-educa tion [accessed 27 June 2020]*.
Bazai, Z. u. R., Manan, S. A., & Pillai, S. (2022). Language policy and planning in the teaching of native languages in Pakistan. *Current Issues in Language Planning*, 1-19.
Becker, G. S. (1975). Investment in human capital: effects on earnings. In *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education, Second Edition* (pp. 13-44): NBER.
Becker, W. E., & Lewis, D. R. (1993). *Higher education and economic growth*: Springer.
Bellini, E., Ottaviano, G. I., Pinelli, D., & Prarolo, G. (2013). *Cultural diversity and economic performance: evidence from European regions*: Springer.
Bellmore, A., Nishina, A., You, J.-i., & Ma, T.-L. (2012). School context protective factors against peer ethnic discrimination across the high school years. *American Journal of Community Psychology*, *49*(1-2), 98-111.

Benson, C. (2005). The importance of mother tongue-based schooling for educational quality. *commissioned study for EFA Global Monitoring Report, 24*.

Benson, C. (2019). L1-based multilingual education in the Asia and Pacific region and beyond: Where are we, and where do we need to go? In *The Routledge international handbook of language education policy in Asia* (pp. 29-41): Routledge.

Berk, R., & MacDonald, J. M. (2008). Overdispersion and Poisson regression. *Journal of Quantitative Criminology, 24*, 269-284.

Berne, R., & Stiefel, L. (1984). *The measurement of equity in school finance: Conceptual, methodological, and empirical dimensions*: Johns Hopkins University Press.

Bettis, R., Gambardella, A., Helfat, C., & Mitchell, W. (2014). Quantitative empirical analysis in strategic management. *Strategic management journal*, 949-953.

Betts, J., & Roemer, J. E. (2005). Equalizing opportunity for racial and socioeconomic groups in the United States through educational finance reform.

Bhattacharya, T. (2005). *The sentinels of culture: class, education, and the colonial intellectual in Bengal (1848-85)*: Oxford University Press, USA.

Bialystok, E. (2001). *Bilingualism in development: Language, literacy, and cognition*: Cambridge University Press.

Birdsall, N. (1996). Public spending on higher education in developing countries: too much or too little? *Economics of Education review, 15*(4), 407-419.

Birdsall, N., Ross, D., & Sabot, R. (1995). Inequality and growth reconsidered: lessons from East Asia. *The World Bank Economic Review, 9*(3), 477-508.

Birdsong, D. (2006). Age and second language acquisition and processing: A selective overview. *Language Learning, 56*, 9-49.

Bizenjo, S. (2020). Education in Pakistan: Are low-cost private schools closing the gender gap? *International Journal of Educational Development, 77*, 102209.

Blankenau, W. F., & Simpson, N. B. (2004). Public education expenditures and growth. *Journal of Development Economics, 73*(2), 583-605.

Blundell, R., & Matzkin, R. L. (2014). Control functions in nonseparable simultaneous equations models. *Quantitative Economics, 5*(2), 271-295.

Blundell, R. W., & Powell, J. L. (2004). Endogeneity in semiparametric binary response models. *The Review of Economic Studies, 71*(3), 655-679.

Bodis, A. (2021). 'Double deficit'and exclusion: Mediated language ideologies and international students' multilingualism. *Multilingua, 40*(3), 367-391.

Bortkiewicz, L. (1898). The law of small numbers. *BG Teubner, Leipzig, Germany.(en. wikipedia. org/wiki/Poisson_distribution)*.

Bose, N., Haque, M. E., & Osborn, D. R. (2003). Public expenditure and growth in developing countries: Education is the key. *Centre for Growth and Business Cycle Research Discussion Paper Series, 30*.

Bove, V., & Elia, L. (2017). Migration, Diversity, and Economic Growth. *World Development, 89*, 227-239. doi:10.1016/j.worlddev.2016.08.012

Bray, M. (1993). Education and the vestiges of colonialism: Self-determination, neocolonialism and dependency in the South Pacific. *Comparative Education, 29*(3), 333-348.

Brennan, G. (1976). The distributional implications of public goods. *Econometrica: Journal of the Econometric Society*, 391-399.

Bretton, H. (1976). Political science, language, and politics. *Language and politics*, 432-448.

Brock-Utne, B. (2001a). Education for All-in whose language? *Oxford Review of Education, 27*(1), 115-134.

Brock-Utne, B. (2001b). Education for all - in whose language? *Oxford Review of Education, 27*(1), 115-134. doi:10.1080/03054980125577
Brock-Utne, B. (2005). Language-in-education policies and practices in Africa with a special focus on Tanzania and South Africa–insights from research in progress. *Decolonisation, Globalisation*, 51.
Brock-Utne, B. (2010). Research and policy on the language of instruction issue in Africa. *International Journal of Educational Development, 30*(6), 636-645.
Brooks-Lewis, K. A. (2009). Adult learners' perceptions of the incorporation of their L1 in foreign language teaching and learning. *Applied linguistics, 30*(2), 216-235.
Brown, P., & James, D. (2020). Educational expansion, poverty reduction and social mobility: Reframing the debate. *International Journal of Educational Research, 100*, 101537.
Brueckner, M., Van Long, N., & Vespignani, J. (2022). Trade, education, and income inequality. *Applied Economics, 54*(40), 4608-4631.
Calarco, J. M. (2011). "I need help!" Social class and children's help-seeking in elementary school. *American Sociological Review, 76*(6), 862-882.
Canagarajah, A. S. (1999). *Resisting linguistic imperialism in English teaching*: Oxford University Press.
Caraballo, M. Á., & Buitrago, E. M. (2019). Ethnolinguistic diversity and education. A successful pairing. *Sustainability, 11*(23), 6625.
Carnoy, M. (2011). As higher education expands, is it contributing to greater inequality? *National Institute Economic Review, 215*, R34-R47.
Castro, D. C., Páez, M. M., Dickinson, D. K., & Frede, E. (2011). Promoting language and literacy in young dual language learners: Research, practice, and policy. *Child development perspectives, 5*(1), 15-21.
Chabbott, C., & Ramirez, F. O. (2000). Development and education. In *Handbook of the Sociology of Education* (pp. 163-187): Springer.
Chall, J. S. (1989). Learning to Read: The Great Debate 20 Years Later--A Response to" Debunking the Great Phonics Myth.". *Phi Delta Kappan, 70*(7), 521-538.
Chandra, N. K., Roy, D., & Ghosh, T. (2013). A generalized Poisson distribution. *Communications in Statistics-Theory and Methods, 42*(15), 2786-2797.
Chang, A., McDonald, P., & Burton, P. (2010). Methodological choices in work-life balance research 1987 to 2006: A critical review. *The International Journal of Human Resource Management, 21*(13), 2381-2413.
Chatterjee, P. (1986). *Nationalist thought and the colonial world: a derivative discourse?* : Zed Books.
Chen, T. (2003). Reticence in class and on-line: Two ESL students' experiences with communicative language teaching. *System, 31*(2), 259-281.
Cheng, S., & Li, H. (2012). New firm formation facing cultural and racial diversity. *Papers in Regional Science, 91*(4), 759-774.
Chesher, A. (2010). Instrumental variable models for discrete outcomes. *Econometrica, 78*(2), 575-601.
Chiswick, B. R. (1988). Differences in education and earnings across racial and ethnic groups: Tastes, discrimination, and investments in child quality. *The quarterly journal of economics, 103*(3), 571-597.
Chiswick, B. R. (1991). Speaking, reading, and earnings among low-skilled immigrants. *Journal of labor economics, 9*(2), 149-170.
Chiswick, B. R., & Miller, P. W. (1995). The endogeneity between language and earnings: International analyses. *Journal of labor economics, 13*(2), 246-288.

Chowdhury, E. K., & Chowdhury, R. (2023). Role of financial inclusion in human development: Evidence from Bangladesh, India and Pakistan. *Journal of the Knowledge Economy*, 1-26.
Christian, M. (2002). *Development Centre Studies Education and Health Expenditure, and Development the Cases of Indonesia and Peru: The Cases of Indonesia and Peru*: OECD Publishing.
Clegg, J., & Milligan, L. O. (2021). Multilingual learning and language-supportive teaching in Rwandan learning materials. In *Multilingual learning and language supportive pedagogies in Sub-Saharan Africa* (pp. 201-227): Routledge.
Clemens, M. A., Özden, Ç., & Rapoport, H. (2014). Migration and development research is moving far beyond remittances. *World Development, 64*, 121-124.
Coady, D., Grosh, M. E., & Hoddinott, J. (2004). Targeting of transfers in developing countries: Review of lessons and experience.
Colclough, C., & Lewin, K. M. (1993). *Educating all the children: strategies for primary schooling in the South*: Clarendon Press.
Coleman, H. (2010). The English language in development. *British council*, 1-24.
Collier, P. (2001). Implications of ethnic diversity. *Economic policy, 16*(32), 128-166.
Collier, P. (2009). The political economy of state failure. *Oxford Review of Economic Policy, 25*(2), 219-240.
Collier, V. P. (1987). Age and rate of acquisition of second language for academic purposes. *Tesol Quarterly, 21*(4), 617-641.
Condron, D. J., & Roscigno, V. J. (2003). Disparities within: Unequal spending and achievement in an urban school district. *Sociology of Education*, 18-36.
Coombs, P. H. (1985). *The world crisis in education the view from the eighties*: Oxford University Press.
Cooper, R. L. (1989). Language planning and social change. In: Cambridge University Press.
Cooper, R. L., & Cooper, R. L. C. (1989). *Language planning and social change*: Cambridge University Press.
Corak, M. (2013). Income inequality, equality of opportunity, and intergenerational mobility. *Journal of Economic perspectives, 27*(3), 79-102.
Cox, D., & Lewis, P. (1966). The statistical analysis of. *Series of Events*.
Cox, D. R. (1983). Some remarks on overdispersion. *Biometrika, 70*(1), 269-274.
Crawford, M., & Marin, S. V. (2021). Loud and Clear: Effective Language of Instruction Policies for Learning. A World Bank Policy Approach Paper. *World Bank*.
Cretchley, J., Gallois, C., Chenery, H., & Smith, A. (2010). Conversations between carers and people with schizophrenia: a qualitative analysis using leximancer. *Qualitative Health Research, 20*(12), 1611-1628.
Crompton, R. (2008). *Class and stratification*: Polity.
Cuenca, J. S. (2008). *Benefit incidence analysis of public spending on education in the Philippines: A methodological Note*. Retrieved from
Cuesta, J., Jellema, J., & Ferrone, L. (2021). Fiscal policy, Multidimensional poverty, and equity in Uganda: A Child-Lens analysis. *The European Journal of Development Research, 33*, 427-458.
Cummins, J. (2000). Academic language learning, transformative pedagogy, and information technology: Towards a critical balance. *Tesol Quarterly, 34*(3), 537-548.
Cummins, J. (2021). *Rethinking the education of multilingual learners: A critical analysis of theoretical concepts* (Vol. 19): Multilingual Matters.

Dale-Olsen, H., & Finseraas, H. (2020). Linguistic diversity and workplace productivity. *Labour Economics, 64*, 101813.

Davoodi, H. R., Tiongson, E. R., & Asawanuchit, S. S. (2010). Benefit incidence of public education and health spending worldwide: evidence from a new database. *Poverty & Public Policy, 2*(2), 5-52.

De Coninck, D., Clycq, N., & Van Praag, L. (2023). School staff's views on causes of early school leaving in regular secondary and adult education: Identifying the role of individual, job-related and school climate characteristics. *British Educational Research Journal*.

De Wulf, L. (1975). Fiscal Incidence Studies in Developing Countries: Survey and Critique (Etude sur l'incidence de la politique budgétaire dans les pays en voie de développement: examen analytique et critique)(Estudios de incidencia fiscal en los países en desarrollo: Investigación y crítica). *Staff Papers-International Monetary Fund*, 61-131.

Dean, C., & Lawless, J. F. (1989). Tests for detecting overdispersion in Poisson regression models. *Journal of the American Statistical Association, 84*(406), 467-472.

Dekker, D., & Young, C. (2005). Bridging the gap: The development of appropriate educational strategies for minority language communities in the Philippines. *Current Issues in Language Planning, 6*(2), 182-199.

Demery, L. (2003). Analyzing the incidence of public spending. *The impact of economic policies on poverty and income distribution: Evaluation techniques and tools*, 41-68.

Demery, L., & Gaddis, I. (2009). Social Spending, Poverty and Gender Equality in Kenya-A Benefit Incidence Analysis. *Eschborn: German Technical Cooperation*, 1-38.

Desmet, K., Ortuño-Ortín, I., & Wacziarg, R. (2016). Linguistic cleavages and economic development. In *The Palgrave handbook of economics and language* (pp. 425-446): Springer.

Di Gioacchino, D., Sabani, L., & Tedeschi, S. (2019). Individual preferences for public education spending: does personal income matter? *Economic Modelling, 82*, 211-228.

Dreze, J., & Sen, A. (2003). Basic education as a political issue. *Education, society and development: National and international perspectives, 3*.

Drèze, J., & Sen, A. (2002). Democratic practice and social inequality in India. *Journal of Asian and African studies, 37*(2), 6-37.

Driessen, G. (2010). School and classroom diversity effects on cognitive and non-cognitive student outcomes.

Duflo, E., & Banerjee, A. (2011). *Poor economics* (Vol. 619): PublicAffairs New York, NY, USA.

Duncan, G. J., Brooks-Gunn, J., & Klebanov, P. K. (1994). Economic deprivation and early childhood development. *Child development, 65*(2), 296-318.

Dustmann, C., & Fabbri, F. (2003). Language proficiency and labour market performance of immigrants in the UK. *The economic journal, 113*(489), 695-717.

Easterbrook, M. J., & Hadden, I. R. (2021). Tackling educational inequalities with social psychology: Identities, contexts, and interventions. *Social Issues and Policy Review, 15*(1), 180-236.

EASTERLY, W. (1999). PUBLIC GOODS AND ETHNIC DIVISIONS* ALBERTO ALESINA REZA BAQIR. *Technology, 1243*.

Easterly, W., Alesina, A. F., & Baqir, R. (1997). Public Goods and Ethnic Divisions. *Available at SSRN 46092*.

Easterly, W., & Levine, R. (1997). Africa's growth tragedy: policies and ethnic divisions. *The quarterly journal of economics*, 1203-1250.

Edstrom, A. (2006). L1 use in the L2 classroom: One teacher's self-evaluation. *Canadian Modern Language Review, 63*(2), 275-292.

Effendi, A. M. s., Rini, S., & Kusumawati, E. R. (2022). Bilingual Learning in Global English Class Learning Communities for Elementary School Level Children. *Maharot: Journal of Islamic Education, 6*(2), 141-152.

Eifert, B., Miguel, E., & Posner, D. N. (2010). Political competition and ethnic identification in Africa. *American journal of political science, 54*(2), 494-510.

Espinosa, L. M. (2005). Curriculum and assessment considerations for young children from culturally, linguistically, and economically diverse backgrounds. *Psychology in the Schools, 42*(8), 837-853.

Fang, F., Jiang, L., & Yang, J. (2023). To impart knowledge or to adhere to policy: Unpacking language ideologies and practices in Chinese EMI courses through a translanguaging lens. *Language Teaching Research*, 13621688231183771.

Faust, D., & Nagar, R. (2001). Politics of development in postcolonial India: English-medium education and social fracturing. *Economic and Political Weekly*, 2878-2883.

Fearon, J. D. (2003a). Ethnic and cultural diversity by country. *Journal of Economic Growth*, 195-222.

Fearon, J. D. (2003b). Ethnic and cultural diversity by country. *Journal of Economic Growth, 8*(2), 195-222.

Fearon, J. D., & Laitin, D. D. (2003). Ethnicity, insurgency, and civil war. *American political science review, 97*(1), 75-90.

Ferraro, S., Agasisti, T., Porcelli, F., & Soncin, M. (2021). Local governments' efficiency and educational results: empirical evidence from Italian primary schools. *Applied Economics, 53*(35), 4017-4039.

Fiala, O., & Delamonica, E. (2022). Public Spending and Investment in Children: Measuring and Assessing Social and Economic Justice. In *Social Justice for Children in the South* (pp. 43-59): Springer.

Fischer-Tiné, H., & Mann, M. (2004). *Colonialism as civilizing mission: Cultural ideology in British India*: Anthem Press.

Fishman, J. A. (1991). *Reversing language shift: Theoretical and empirical foundations of assistance to threatened languages* (Vol. 76): Multilingual matters.

Fishman, J. A., Ferguson, C. A., & Dasgupta, J. (1968). *Language problems of developing nations*: Wiley New York.

Fishman, P. M. (1997). Interaction: The work women do. In *Sociolinguistics* (pp. 416-429): Springer.

Flew, T. (2010). Toward a cultural economic geography of creative industries and urban development: introduction to the special issue on creative industries and urban development. *The information society, 26*(2), 85-91.

Foorman, B. R., & Nixon, S. M. (2006). The influence of public policy on reading research and practice. *Topics in language disorders, 26*(2), 157-171.

Friedman, M. (1953). *Essays in positive economics*: University of Chicago press.

Frome, E. L., Cragle, D. L., & McLain, R. W. (1990). Poisson regression analysis of the mortality among a cohort of World War II nuclear industry workers. *Radiation research, 123*(2), 138-152.

Fujii, T., Nakajima, M., & Xu, S. (2023). Teaching in the right context: Textbook supply program, language, and learning. *Review of Development Economics*.

Furqan, U., Hanif, A., & Hanif, M. Z. (2022). The Struggle to Reform Higher Education Sector of Pakistan: Past reforms, Recent Initiatives and Confronted Challenges. *Journal of the Research Society of Pakistan, 59*(2), 138.

Gafar, J. (2006). The benefit–incidence of public spending: The Caribbean experience. *Journal of International Development: The Journal of the Development Studies Association, 18*(4), 449-468.

Gallagher, M. (1993). A public choice theory of budgets: implications for education in less developed countries. *Comparative Education Review, 37*(2), 90-106.

Gannon, K. E., Pettinotti, L., Conway, D., Surminski, S., Ndilanha, E., & Nyumba, T. (2022). Delivering the Sustainable Development Goals through development corridors in East Africa: A Q-Methodology approach to imagining development futures. *Environmental Science & Policy, 129*, 56-67.

Gardner, W., Mulvey, E. P., & Shaw, E. C. (1995). Regression analyses of counts and rates: Poisson, overdispersed Poisson, and negative binomial models. *Psychological bulletin, 118*(3), 392.

Gershman, B., & Rivera, D. (2018). Subnational diversity in Sub-Saharan Africa: Insights from a new dataset. *Journal of Development Economics, 133*, 231-263.

Gfeller, E., & Robinson, C. (1998). Which language for teaching? The cultural messages transmitted by the languages used in education. *Language and Education, 12*(1), 18-32.

Ghosh, A. (2002). Revisiting the'Bengal Renaissance': Literary Bengali and Low-Life Print in Colonial Calcutta. *Economic and Political Weekly*, 4329-4338.

Ghosh, D. (2004). Gender and colonialism: expansion or marginalization? *The Historical Journal, 47*(3), 737-755.

Gillespie, I. (1966). The Incidence of Taxes and Public Expenditures in the Canadian Economy. Studies of the Royal Commission on Taxation. *Carleton University, Dept. of Economics (2)*.

Ginsburgh, V., & Weber, S. (2020). The economics of language. *Journal of Economic Literature, 58*(2), 348-404.

Ginsburgh, V. A., & Weber, S. (2014). Culture, linguistic diversity, and economics. In *Handbook of the Economics of Art and Culture* (Vol. 2, pp. 507-543): Elsevier.

Gisselquist, R. M., Leiderer, S., & Nino-Zarazua, M. (2016). Ethnic heterogeneity and public goods provision in Zambia: Evidence of a subnational "diversity dividend". *World Development, 78*, 308-323.

Glaeser, E. L., Kallal, H. D., Scheinkman, J. A., & Shleifer, A. (1992). Growth in cities. *Journal of political economy, 100*(6), 1126-1152.

Glewwe, P., & Kremer, M. (2006). Schools, teachers, and education outcomes in developing countries. *Handbook of the Economics of Education, 2*, 945-1017.

Glewwe, P., Lambert, S., & Chen, Q. (2020). Education production functions: updated evidence from developing countries. In *The Economics of Education* (pp. 183-215): Elsevier.

Glewwe, P. W., Hanushek, E. A., Humpage, S. D., & Ravina, R. (2011). School resources and educational outcomes in developing countries: A review of the literature from 1990 to 2010.

Gonzales, J. B. (2018). MOTHER TONGUE-BASED MULTILINGUAL EDUCATION IMPLEMENTATION IN CEBU PHILIPPINES, IN THE EYES OF THE STAKEHOLDERS. *International Journal of Research Science and Management, 5*(2), 165-172.

Gören, E. (2014). How Ethnic Diversity Affects Economic Growth. *World Development, 59*, 275-297. doi:10.1016/j.worlddev.2014.01.012

Gove, A., & Cvelich, P. (2011). Early reading: Igniting education for all. A report by the early grade learning community of practice. *RTI International*.

Gradstein, M., & Justman, M. (2002). Education, social cohesion, and economic growth. *american economic Review, 92*(4), 1192-1204.

Graham, B. E. (2010). Mother tongue education: necessary? Possible? Sustainable? *Language and Education, 24*(4), 309-321.

Greenberg, J. H. (1956). The measurement of linguistic diversity. *Language, 32*(1), 109-115.

Greenwood, M., & Yule, G. U. (1920). An inquiry into the nature of frequency distributions representative of multiple happenings with particular reference to the occurrence of multiple attacks of disease or of repeated accidents. *Journal of the Royal statistical society, 83*(2), 255-279.

Grimshaw, G. M., Adelstein, A., Bryden, M. P., & MacKinnon, G. (1998). First-language acquisition in adolescence: Evidence for a critical period for verbal language development. *Brain and Language, 63*(2), 237-255.

Grin, F. (1999). Language Policy in Multilingual Switzerland-Overview and Recent Developments.

Grin, F. (2003). Language plan and economics. *Current Issues in Language Planning, 4*(1), 1-66.

Gu, H., Liu, Z., Shen, T., & Meng, X. (2019). Modelling interprovincial migration in China from 1995 to 2015 based on an eigenvector spatial filtering negative binomial model. *Population, Space and Place, 25*(8), e2253.

Guiso, L., Sapienza, P., & Zingales, L. (2006). Does culture affect economic outcomes? *Journal of Economic perspectives, 20*(2), 23-48.

Günther, J., Overbeck, A. K., Muster, S., Tempel, B. J., Schaal, S., Schaal, S., . . . Otto, S. (2022). Outcome indicator development: Defining education for sustainable development outcomes for the individual level and connecting them to the SDGs. *Global Environmental Change, 74*, 102526.

Gupta, M. S., Tiongson, M. E., & Verhoeven, M. (1999). *Does higher government spending buy better results in education and health care?* : International Monetary Fund.

Gurevich, T., Herman, P., Toubal, F., & Yotov, Y. (2021). One nation, one language? domestic language diversity, trade and welfare.

Habib, M. (2013). Education in Pakistan's Punjab: Outcomes and Interventions. *Lahore Journal of Economics, 18*.

Haidar, S. (2017). Access to English in Pakistan: Inculcating prestige and leadership through instruction in elite schools. *International Journal of Bilingual Education and Bilingualism*.

Haidar, S., & Fang, F. (2019). English language in education and globalization: a comparative analysis of the role of English in Pakistan and China. *Asia Pacific Journal of Education, 39*(2), 165-176. doi:10.1080/02188791.2019.1569892

Haidar, S., & Manan, S. A. (2021). English in Pakistan: Language policy, features and present-day use. In *English in East and South Asia* (pp. 242-255): Routledge.

Haider, S. A., Gul, A., Anwar, B., Tehseen, S., & Iqbal, S. (2021). The impacts of the COVID-19 outbreak on the education sector: Evidence from Pakistan. In *Impact of infodemic on organizational performance* (pp. 311-328): IGI Global.

Hakro, A. N. (2007). The Incidence of Government Expenditures on Education and Health: Microeconomic Evidence from Pakistan Ahmed Nawaz Hakro and Muhammed Akram. *Lahore Journal of Economics, 12*(2), 27-48.

Hamid, M. O., Jahan, I., & Islam, M. M. (2013). Medium of instruction policies and language practices, ideologies and institutional divides: Voices of teachers and students in a private university in Bangladesh. *Current Issues in Language Planning, 14*(1), 144-163.

Hamid, M. O., & Rahman, A. (2019). Language in education policy in Bangladesh: A neoliberal turn? In *The Routledge international handbook of language education policy in Asia* (pp. 382-395): Routledge.

Hanley, J. A., & Bhatnagar, S. (2022). The "Poisson" Distribution: History, Reenactments, Adaptations. *The American Statistician, 76*(4), 363-371.

Hannan, M. T., & Carroll, G. R. (1992). *Dynamics of organizational populations: Density, legitimation, and competition*: Oxford University Press.

Hanushek, E. A. (1986). The economics of schooling: Production and efficiency in public schools. *Journal of Economic Literature, 24*(3), 1141-1177.

Hanushek, E. A. (1994). Money might matter somewhere: A response to Hedges, Laine, and Greenwald. *Educational Researcher, 23*(4), 5-8.

Hanushek, E. A., & Woessmann, L. (2012). Do better schools lead to more growth? Cognitive skills, economic outcomes, and causation. *Journal of Economic Growth, 17*, 267-321.

Hanushek, E. A., & Wößmann, L. (2007). The role of education quality for economic growth. *World Bank policy research working paper*(4122).

Hardach, S. (2018). Speaking more than one language can boost economic growth. *World*.

Hartenian, L. S., & Gudmundson, D. E. (2000). Cultural diversity in small business: Implications for firm performance. *Journal of Developmental Entrepreneurship, 5*(3), 209.

Harwood, I. A., Gapp, R., & Stewart, H. (2015). Cross-check for completeness: Exploring a novel use of Leximancer in a grounded theory study. *The Qualitative Report, 20*(7), 1029-1045.

Haveman, R., & Smeeding, T. (2006). The role of higher education in social mobility. *The Future of children*, 125-150.

Heckman, J., & Navarro-Lozano, S. (2004). Using matching, instrumental variables, and control functions to estimate economic choice models. *Review of Economics and statistics, 86*(1), 30-57.

Heckman, J. J., & Robb Jr, R. (1985). Alternative methods for evaluating the impact of interventions: An overview. *Journal of econometrics, 30*(1-2), 239-267.

Hedges, L. V., Laine, R. D., & Greenwald, R. (1994). An exchange: Part I: Does money matter? A meta-analysis of studies of the effects of differential school inputs on student outcomes. *Educational Researcher, 23*(3), 5-14.

Heltberg, R., Simler, K. R., & Tarp, F. (2003). *Public spending and poverty in Mozambique*. Retrieved from

Herbers, J. E., Cutuli, J., Supkoff, L. M., Heistad, D., Chan, C.-K., Hinz, E., & Masten, A. S. (2012). Early reading skills and academic achievement trajectories of students facing poverty, homelessness, and high residential mobility. *Educational Researcher, 41*(9), 366-374.

Heymann, J., Raub, A., & Cassola, A. (2014). Constitutional rights to education and their relationship to national policy and school enrolment. *International Journal of Educational Development, 39*, 121-131.

Heyneman, S. P., & Stern, J. M. (2014). Low cost private schools for the poor: What public policy is appropriate? *International Journal of Educational Development, 35*, 3-15.

Hirani, S. A. A., & Karmaliani, R. (2013). The experiences of urban, professional women when combining breastfeeding with paid employment in Karachi, Pakistan: a qualitative study. *Women and birth, 26*(2), 147-151.
Hjort, J. (2014a). Ethnic divisions and production in firms. *The quarterly journal of economics, 129*(4), 1899-1946.
Hjort, J. (2014b). Ethnic Divisions and Production in Firms

*. *The quarterly journal of economics, 129*(4), 1899-1946. doi:10.1093/qje/qju028
Hoffman, D. (2003). Negative binomial control limits for count data with extra-Poisson variation. *Pharmaceutical Statistics: The Journal of Applied Statistics in the Pharmaceutical Industry, 2*(2), 127-132.
Hornberger, N. H. (2003). *Continua of biliteracy: An ecological framework for educational policy, research, and practice in multilingual settings* (Vol. 41): Multilingual Matters.
Hornberger, N. H. (2008). *Can schools save indigenous languages?* : Palgrave Macmillan New York, NY.
Horvath, T., & Huber, P. (2019). Regional ethnic diversity and the employment prospects of immigrants. *Regional Studies, 53*(2), 272-282.
Horwitz, A. V., & Wakefield, J. C. (2007). *The loss of sadness: How psychiatry transformed normal sorrow into depressive disorder*: Oxford University Press.
Hossain, K. I. (2024). Reviewing the role of culture in English language learning: Challenges and opportunities for educators. *Social Sciences & Humanities Open, 9*, 100781.
Hou, D. (2022). The Impact of Education on Domestic Terrorism in Asia: A Control Function Approach. *Defence and Peace Economics, 33*(7), 857-875.
Hovens, M. (2002). Bilingual education in West Africa: Does it work? *International Journal of Bilingual Education and Bilingualism, 5*(5), 249-266.
Hudson, M. C., & Taylor, C. L. (1972). *World handbook of political and social indicators*: Yale University Press New Haven, Conn.
Humboldt, W. (1988). On language: The diversity of human language-structure and its influence on the mental development of mankind.
Hunt, V., Prince, S., Dixon-Fyle, S., & Yee, L. (2018). Delivering through diversity. *McKinsey & Company, 231*, 1-39.
Husain, I. (2009). The role of politics in Pakistan's Economy. *Journal of International Affairs, 63*(1), 1-18.
Ilie, S., & Rose, P. (2018). Who benefits from public spending on higher education in South Asia and sub-Saharan Africa? *Compare: A Journal of Comparative and International Education, 48*(4), 630-647.
Ilon, L. (2000). Colonial secondary education in a global age: Economic. *Asia Pacific Education Review, 1*, 91-99.
Jabeen, S. (2020). Language planning and policy, and the medium of instruction in the multilingual Pakistan: a void to be filled. *International Journal of Multilingualism*, 1-18.
Jackson, B., & Marsden, D. (1966). Education and the Working Class (1962). *Both published by Routledge & Kegan Paul, London*.
Jackson, M. I., & Schneider, D. (2022). Public investments and class gaps in parents' developmental expenditures. *American Sociological Review, 87*(1), 105-142.
Jacobs, B. D. (1992). *Fractured cities: Capitalism, community, and empowerment in Britain and America*: Psychology Press.

Jaekel, N., Schurig, M., Florian, M., & Ritter, M. (2017). From early starters to late finishers? A longitudinal study of early foreign language learning in school. *Language Learning, 67*(3), 631-664.
Jain, T. (2011). Common tongue: The impact of language on economic performance.
Jamal, A. (2016). Why he Won't send his daughter to school—Barriers to girls' education in Northwest Pakistan: A qualitative Delphi study of Pashtun men. *Sage Open, 6*(3), 2158244016663798.
James, E. (1993). Why do different countries choose a different public-private mix of educational services? *Journal of human resources*, 571-592.
Jashi, N. (2022). Topical issues of the mother tongue in primary school. *Language and Culture*(27).
Jenkins, G. (1980). Who benefits from government expenditures? A case study of colombia: Marcelo Selowsky (Oxford University Press, New York, 1979) pp. xv+ 186, cloth $12.50 paperback $4.98. *Journal of Development Economics, 7*(4), 584-587.
Jimenez, E., & Tan, J. P. (1987). Decentralised and private education: The case of Pakistan. *Comparative Education, 23*(2), 173-190.
Johnson, D. C., & Pratt, K. L. (2014). Educational language policy and planning. *The encyclopedia of applied linguistics*, 1-7.
Johnson, N. L., Kemp, A. W., & Kotz, S. (2005). *Univariate discrete distributions* (Vol. 444): John Wiley & Sons.
Jones, J. C. H., Nadeau, S., & Walsh, W. D. (1999). Ethnicity, productivity and salary: player compensation and discrimination in the National Hockey League. *Applied Economics, 31*(5), 593-608.
Judson, R. (1998). Economic growth and investment in education: how allocation matters. *Journal of Economic Growth, 3*(4), 337-359.
Kang, E. (2022). Whose money matters in public education: A "public" good that parents purchase. *Policy Futures in Education, 20*(8), 960-985.
Kaplan, R. B., & Baldauf, R. B. (1997). *Language planning from practice to theory* (Vol. 108): Multilingual Matters.
Karnane, P., & Quinn, M. A. (2019). Political instability, ethnic fractionalization and economic growth. *International Economics and Economic Policy, 16*(2), 435-461.
Kassem, D., Mufti, E., & Robinson, J. (2006). *Education Studies: Issues & Critical Perspectives: Issues and Critical Perspectives*: McGraw-Hill Education (UK).
Kemeny, T. (2012). Cultural diversity, institutions, and urban economic performance. *Environment and Planning A, 44*(9), 2134-2152.
Khan, A. W., Sethi, A., Wajid, G., & Yasmeen, R. (2020). Challenges towards quality assurance of Basic Medical Education in Pakistan. *Pakistan journal of medical sciences, 36*(2), 4.
Khan, S. (2016). Impact of father education on female education in Pashtun society of district Charsadda, Pakistan. *Imperial Journal of Interdisciplinary Research, 2*(4), 1013-1019.
Khattak, S. (2014). A comparative analysis of the elite–English-medium schools, state Urdu-medium schools, and Dini-madaris in Pakistan. *International Journal of Multidisciplinary Comparative Studies, 1*(1), 92-107.
Kirama, S. L. (2021). Public Social Spending and Poverty in Tanzania: A Benefit Incidence Analysis. *Tanzanian Economic Review, 11*(1).
Klees, S. J. (2008). A quarter century of neoliberal thinking in education: Misleading analyses and failed policies. *Globalisation, Societies and Education, 6*(4), 311-348.
Kloss, H. (1969). Research Possibilities on Group Bilingualism: A Report.

Kosonen, K. (2005). Education in local languages: Policy and practice in South-East Asia. *Asia-Pacific Programme of Education for All First Language First: Community-based Literacy Programmes for Minority Language Contexts in Asia. Bangkok: UNESCO Bangkok, 2005.*, 96.

Kosonen, K., & Benson, C. (2013). Introduction: Inclusive teaching and learning through the use of non-dominant languages and cultures. In *Language issues in comparative education* (pp. 1-16): Brill Sense.

Kotlikoff, L. J., & Summers, L. H. (1987). Tax incidence. In *Handbook of public economics* (Vol. 2, pp. 1043-1092): Elsevier.

Kousar, S., Ahmed, F., Afzal, M., & Segovia, J. E. (2023). Is government spending in the education and health sector necessary for human capital development? *Humanities and Social Sciences Communications, 10*(1), 1-11.

Krashen, S. D., & Seliger, H. W. (1975). The essential contributions of formal instruction in adult second language learning. *Tesol Quarterly*, 173-183.

Krishna, S., Ojha, A. K., & Barrett, M. (2017). Competitive advantage in the software industry: an analysis of the Indian experience. In *Information technology in context* (pp. 182-197): Routledge.

Krishnaratne, S., & White, H. (2013). *Quality education for all children? What works in education in developing countries*. Retrieved from

Kumar, N. (1991). Widows, Education and Social Change in Twentieth Century Banaras. *Economic and Political Weekly*, WS19-WS25.

Kumari, M. Mother Tongue and Language Rights from the Perspective of Tribal Children Primary Education.

Kyeyune, R. (2003). Challenges of using English as a medium of instruction in multilingual contexts: A view from Ugandan classrooms. *Language culture and curriculum, 16*(2), 173-184.

Laitin, D. D., & Ramachandran, R. (2015). Linguistic diversity, official language choice and nation building: Theory and evidence. *Unpublished Manuscript*, 1-48.

Laitin, D. D., & Ramachandran, R. (2016). Language policy and human development. *American political science review, 110*(3), 457-480.

Land, K. C., McCall, P. L., & Nagin, D. S. (1996). A comparison of Poisson, negative binomial, and semiparametric mixed Poisson regression models: With empirical applications to criminal careers data. *Sociological Methods & Research, 24*(4), 387-442.

Lang, K. (1986). A language theory of discrimination. *The quarterly journal of economics, 101*(2), 363-382.

Lanjouw, P., & Ravallion, M. (1999). Benefit incidence, public spending reforms, and the timing of program capture. *The World Bank Economic Review, 13*(2), 257-273.

Lawless, J. F. (1987). Negative binomial and mixed Poisson regression. *The Canadian Journal of Statistics/La Revue Canadienne de Statistique*, 209-225.

Lee, A. (2018). Ethnic diversity and ethnic discrimination: Explaining local public goods provision. *Comparative Political Studies, 51*(10), 1351-1383.

Lemon, L. L., & Hayes, J. (2020). Enhancing trustworthiness of qualitative findings: Using Leximancer for qualitative data analysis triangulation. *The Qualitative Report, 25*(3), 604-614.

Levin, L. (1972). Comparative Studies in Foreign-Language Teaching. Goteborg Studies in Educational Sciences 9.

Levine, G. S. (2003). Student and instructor beliefs and attitudes about target language use, first language use, and anxiety: Report of a questionnaire study. *The modern language journal, 87*(3), 343-364.

Lipman, P. (2004). *High stakes education: Inequality, globalization, and urban school reform*: Psychology Press.
Littlewood, W., & Yu, B. (2011). First language and target language in the foreign language classroom. *Language teaching, 44*(1), 64-77.
Liu, W. (2023). The theory of second language development for international students. *Journal for Multicultural Education*.
Lloyd, C. B., Mensch, B. S., & Clark, W. H. (2000). The effects of primary school quality on school dropout among Kenyan girls and boys. *Comparative Education Review, 44*(2), 113-147.
Lohmann, J. (2011). Do language barriers affect trade? *Economics Letters, 110*(2), 159-162.
Lone, R. A., & Efstratopoulou, M. (2022). Linguistically-Responsive Educational Framework for Multilingual Contexts: Supporting Children's Academic Achievement. In *Rethinking Inclusion and Transformation in Special Education* (pp. 196-213): IGI Global.
Love-Koh, J., Griffin, S., Kataika, E., Revill, P., Sibandze, S., & Walker, S. (2020). Methods to promote equity in health resource allocation in low-and middle-income countries: an overview. *Globalization and health, 16*, 1-12.
Lu, G., Ding, X. D., Peng, D. X., & Chuang, H. H.-C. (2018). Addressing endogeneity in operations management research: Recent developments, common problems, and directions for future research. *Journal of Operations Management, 64*, 53-64.
Mac Iver, M. A., & Kemper, E. (2002). The impact of Direct Instruction on elementary students' reading achievement in an urban school district. *Journal of Education for Students Placed at Risk, 7*(2), 197-220.
Macaro, E., Curle, S., Pun, J., An, J., & Dearden, J. (2018). A systematic review of English medium instruction in higher education. *Language teaching, 51*(1), 36-76.
MacKenzie, P. J. (2009). Mother tongue first multilingual education among the tribal communities in India. *International Journal of Bilingual Education and Bilingualism, 12*(4), 369-385.
Mainardi, S. (2007). Unequal access to public healthcare facilities: theory and measurement revisited. *Surveys in Mathematics and its Applications, 2*, 91-112.
Malik, A. H. (2015). *A comparative study of elite English-medium schools, public schools, and Islamic Madaris in contemporary Pakistan*: Lulu. com.
Malik, S. M., & Ashraf, N. (2016). Equity in the use of public services for mother and newborn child health care in Pakistan: a utilization incidence analysis. *International journal for equity in health, 15*(1), 1-12.
Manan, S. A., David, M. K., & Channa, L. A. (2019). Opening Ideological and implementational spaces for multilingual/plurilingual policies and practices in education: a snapshot of scholarly activism in Pakistan. *Current Issues in Language Planning, 20*(5), 521-543.
Manan, S. A., David, M. K., & Dumanig, F. P. (2015). Disjunction between language policy and children's sociocultural ecology–an analysis of English-medium education policy in Pakistan. *Language and Education, 29*(5), 453-473.
Manan, S. A., David, M. K., Dumanig, F. P., & Naqeebullah, K. (2015). Politics, economics and identity: Mapping the linguistic landscape of Kuala Lumpur, Malaysia. *International Journal of Multilingualism, 12*(1), 31-50.
Manan, S. A., Dumanig, F. P., & David, M. K. (2017). The English-medium fever in Pakistan: Analyzing policy, perceptions and practices through additive bi/multilingual education lens. *International Journal of Bilingual Education and Bilingualism, 20*(6), 736-752.

Manan, S. A., & Hajar, A. (2022). “Disinvestment” in Learners’ Multilingual Identities: English Learning, Imagined Identities, and Neoliberal Subjecthood in Pakistan. *Journal of Language, Identity & Education*, 1-16.

Mansoor, S. (2004). The Status and Role of Regional Languages in Higher Education in Pakistan. *Journal of Multilingual and Multicultural Development, 25*(4), 333-353. doi:10.1080/01434630408666536

Manton, K. G., Woodbury, M. A., & Stallard, E. (1981). A variance components approach to categorical data models with heterogenous cell populations: analysis of spatial gradients in lung cancer mortality rates in North Carolina counties. *Biometrics*, 259-269.

Marongedza, L., Hlungwani, P. M., & Hove, P. (2023). Institutional constraints affecting secondary school student performance: A case study of rural communities in Zimbabwe. *Cogent Education, 10*(1), 2163552.

Marschak, J. (1965). Economics of language. *Behavioral Science, 10*(2), 135-140.

Marshall, A., & Marshall, M. P. (1920). *The economics of industry*: Macmillan and Company.

Matta, G. (2020). Science communication as a preventative tool in the COVID19 pandemic. *Humanities and Social Sciences Communications, 7*(1), 1-14.

Maume, D. J., & Wilson, G. (2015). Determinants of declining wage mobility in the new economy. *Work and Occupations, 42*(1), 35-72.

Mauro, P. (1995). Corruption and growth. *The quarterly journal of economics, 110*(3), 681-712.

McDonough, P. M. (1994). Buying and selling higher education: The social construction of the college applicant. *The Journal of Higher Education, 65*(4), 427-446.

McMahon, W. W. (2000). *Education and development: Measuring the social benefits*: Clarendon Press.

McMahon, W. W. (2009). The Private and Social Benefits of Higher Education. In: Baltimore: The Johns Hopkins University Press.

Meerman, J. (1979a). Public expenditure in Malaysia: Who benefits and why.

Meerman, J. (1979b). Public expenditure in Malaysia; who benefits and why.

Meeuwisse, M., Severiens, S. E., & Born, M. P. (2010). Learning environment, interaction, sense of belonging and study success in ethnically diverse student groups. *Research in Higher Education, 51*(6), 528-545.

Meighan, P. J. (2023). “What is language for us?”: Community-based Anishinaabemowin language planning using TEK-nology. *Language Policy*, 1-31.

Meredith, B., & Underwood, J. (1995). Irreconcilable differences-defining the rising conflict between Regular and Special Education. *JL & Educ., 24*, 195.

Miaou, S.-P. (1994). The relationship between truck accidents and geometric design of road sections: Poisson versus negative binomial regressions. *Accident Analysis & Prevention, 26*(4), 471-482.

Mickiewicz, T., Hart, M., Nyakudya, F., & Theodorakopoulos, N. (2019). Ethnic pluralism, immigration and entrepreneurship. *Regional Studies, 53*(1), 80-94.

Mieszkowski, P. (1969). Tax incidence theory: The effects of taxes on the distribution of income. *Journal of Economic Literature, 7*(4), 1103-1124.

Miguel, E., & Gugerty, M. K. (2005). Ethnic diversity, social sanctions, and public goods in Kenya. *Journal of Public Economics, 89*(11-12), 2325-2368.

Miller, G. A. (1950). Language engineering. *The Journal of the Acoustical Society of America, 22*(6), 720-725.

Mingat, A. (1998). The strategy used by high-performing Asian economies in education: Some lessons for developing countries. *World Development, 26*(4), 695-715.

Miningou, É. W., Pierre-Louis, M., & Bernard, J. M. (2022). Improving learning outcomes in francophone Africa: More resources or improved efficiency? *African Development Review, 34*(1), 127-141.
Mitra, A. (2015). Public spending in higher education in India: A benefit incidence analysis. *Higher Education for the Future, 2*(1), 71-91.
Moats, L. C. (1994). The missing foundation in teacher education: Knowledge of the structure of spoken and written language. *Annals of dyslexia, 44*, 81-102.
Mohanty, A. K. (2019). Language policy in education in India. In *The Routledge international handbook of language education policy in Asia* (pp. 329-340): Routledge.
Mohanty, A. K., Panda, M., Phillipson, R., & Skutnabb-Kangas, T. (2009). *Multilingual education for social justice: Globalising the local*: Orient Blackswan New Delhi, India.
Montalvo, J. G., & Reynal-Querol, M. (2005). Ethnic diversity and economic development. *Journal of Development Economics, 76*(2), 293-323. doi:10.1016/j.jdeveco.2004.01.002
Montalvo, J. G., & Reynal-Querol, M. (2014). Cultural diversity, conflict, and economic development. In *Handbook of the Economics of Art and Culture* (Vol. 2, pp. 485-506): Elsevier.
Moreno-Fernández, F., & Otero, J. (2008). The status and future of Spanish among the main international languages: Quantitative dimensions. *International Multilingual Research Journal, 2*(1-2), 67-83.
Morris, P. (1996). Asia's four little tigers: A comparison of the role of education in their development. *Comparative Education, 32*(1), 95-110.
Mufwene, S. S. (2010). The role of mother-tongue schooling in eradicating poverty: A response to Language and poverty. *Language, 86*(4), 910-932.
Mughal, A. W., & Aldridge, J. (2017). Head Teachers' Perspectives on School Drop-Out in Secondary Schools in Rural Punjab, Pakistan. *Educational Studies, 53*(4), 359-376.
Mukerji, S. (1957). History of Education in India (Modern Period), Achara Book Depot. In: Baroda.
Munir, F., Ahmad, S., Ullah, S., & Wang, Y. P. (2022). Understanding housing inequalities in urban Pakistan: An intersectionality perspective of ethnicity, income and education. *Journal of Race, Ethnicity and the City, 3*(1), 1-22.
Mweri, J. (2020). Sustainable Development Goals: Reaching People through Their Mother Tongue. *Linguistics and Literature Studies, 8*(1).
Nafula, N. N. (2002). *Achieving sustainable universal primary education through debt relief: The case of Kenya*: WIDER Discussion Paper.
Naveed, A., & Sutoris, P. (2020). Poverty and education in South Asia. *Handbook of education systems in South Asia*, 1-23.
Nawab, A. (2017). What difference could in-service training make? Insights from a public school of Pakistan. *Teacher Development, 21*(1), 142-159.
Nekatibeb, T. (2007). The impact of learning with the mother tongue on academic achievement: A case study of Grade 8 students in Ethiopia. *Language and development: Africa and beyond, 51*.
Neustupný, J. (1970). Basic types of language treatment. *Linguistic Communications, 7*, 78-117.
Nguyen, N. N. (2004). Trends in the education sector. *Economic growth, poverty, and household welfare in Vietnam*, 425-466.

Niebuhr, A. (2010). Migration and innovation: Does cultural diversity matter for regional R&D activity? *Papers in Regional Science, 89*(3), 563-585.
Nikula, T. (2007). Speaking English in Finnish content-based classrooms. *World Englishes, 26*(2), 206-223.
Norman, G., Tugwell, P., Feightner, J., MUZZIN, L. J., & Jacoby, L. (1985). Knowledge and clinical problem-solving. *Medical Education, 19*(5), 344-356.
Núñez, A.-M., Rios-Aguilar, C., Kanno, Y., & Flores, S. M. (2016). English Learners and Their Transition to Postsecondary Education: Higher Education: Handbook of Theory and Research. *Higher education: Handbook of theory and research*, 41-90.
Nurmaliyah, Y., Aripin, S., & Nurdiansyah, N. M. (2023). 2013 Curriculum: Implementation of Islamic Religious Education Learning in Schools for Children with Special Needs. *International Journal of Islamic Thought and Humanities, 2*(1), 124-138.
Nurullah, S., & Naik, J. (1962). A Students' History of Education in India (Revised Edition). *Kolkata: The Inland Printing Works*.
Okebukola, P. A., Owolabi, O., & Okebukola, F. O. (2013). Mother tongue as default language of instruction in lower primary science classes: Tension between policy prescription and practice in Nigeria. *Journal of Research in Science Teaching, 50*(1), 62-81.
Ottaviano, G. I., & Peri, G. (2006). The economic value of cultural diversity: evidence from US cities. *Journal of Economic geography, 6*(1), 9-44.
Panezai, S. G., & Channa, L. A. (2017). Pakistani government primary school teachers and the English textbooks of Grades 1–5: A mixed methods teachers'-led evaluation. *Cogent Education, 4*(1), 1269712.
Peck, J. (2011). Creative moments. *Mobile urbanism: Cities and policymaking in the global age*.
Penn-Edwards, S. (2010). Computer aided phenomenography: the role of Leximancer computer software in phenomenographic investigation. *Qualitative Report, 15*(2), 252-267.
Perez, A. D., & Hirschman, C. (2009). The changing racial and ethnic composition of the US population: Emerging American identities. *Population and development review, 35*(1), 1-51.
Persson, T., & Tabellini, G. (1992). Growth, distribution and politics. *European Economic Review, 36*(2-3), 593-602.
Peshkin, A. (1962). Education, the Muslim elite, and the creation of Pakistan. *Comparative Education Review, 6*(2), 152-159.
Phillipson, R. (1992). *Linguistic imperialism*: Oxford University Press.
Piller, I., & Bodis, A. (2024). Marking and unmarking the (non) native speaker through English language proficiency requirements for university admission. *Language in Society, 53*(1), 1-23.
Piller, I., Bruzon, A. S., & Torsh, H. (2023). Monolingual school websites as barriers to parent engagement. *Language and Education, 37*(3), 328-345.
Piller, I., Torsh, H., Bodis, A., & Bruzon, A. S. (2024). The monolingual habitus of the multilingual school as a barrier to educational equity. *The Routledge International Handbook of Equity and Inclusion in Education*, 260.
Pinnock, H., & Vijayakumar, G. (2009). *Language and education: the missing link: how the language used in schools threatens the achievement of Education For All*: CfBT Education Trust Berkshire, England.

Poisson, S. D. (1837). Probabilité des jugements en matière criminelle et en matière civile, précédées des règles générales du calcul des probabilitiés. *Paris, France: Bachelier, 1*, 1837.

Pool, J. (1972). (1972). National development and language diversity.

Posner, M. I., Snyder, C. R., & Solso, R. (2004). Attention and cognitive control. *Cognitive psychology: Key readings, 205*.

Pritchett, L., & Filmer, D. (1999). What education production functions really show: a positive theory of education expenditures. *Economics of Education review, 18*(2), 223-239.

Pučėtaitė, R., Novelskaitė, A., Pušinaitė-Gelgotė, R., Rusteikienė, A., & Butkevičienė, E. (2019). Understanding the Role of Social Enterprises in Attaining the Sustainable Development Goals through the Human Capability Approach.

Quang, C. D. (2012). *The mother language teaching program addressing the language, culture, and identity rights of the Cham minority in Ninh Thuan province, Vietnam.* University of Hawai'i at Manoa,

Qureshi, M. G. (2012). The gender differences in school enrolment and returns to education in Pakistan. *The Pakistan Development Review*, 219-256.

Qureshi, N., & Kalsoom, Q. (2022). Teacher Education in Pakistan: Structure, Problems, and Opportunities. In *Handbook of Research on Teacher Education: Innovations and Practices in Asia* (pp. 971-986): Springer.

Raabe, T., & Beelmann, A. (2011). Development of ethnic, racial, and national prejudice in childhood and adolescence: A multinational meta-analysis of age differences. *Child development, 82*(6), 1715-1737.

Rahman, M., Hamzah, M. I. M., Meerah, T., & Rahman, M. (2010). Historical Development of Secondary Education in Bangladesh: Colonial Period to 21st Century. *International education studies, 3*(1), 114-125.

Rahman, M. M., Islam, M. S., Karim, A., Chowdhury, T. A., Rahman, M. M., Seraj, P. M. I., & Singh, M. K. M. (2019). English language teaching in Bangladesh today: Issues, outcomes and implications. *Language Testing in Asia, 9*(1), 1-14.

Rahman, M. M., & Singh, M. K. M. (2020). Language ideology of English-medium instruction in higher education: A case study from Bangladesh. *English Today, 36*(4), 40-46.

Rahman, T. (1995). *Language planning and politics in Pakistan*: Sustainable Development Policy Institute.

Rahman, T. (1998). Language and ethnicity in Pakistan. In *Text in Education and Society* (pp. 238-245): World Scientific.

Rahman, T. (2004). *Language policy and localization in Pakistan: proposal for a paradigmatic shift.* Paper presented at the SCALLA Conference on computational linguistics.

Rahman, T. (2005). The Muslim response to English in South Asia: With special reference to inequality, intolerance, and militancy in Pakistan. *Journal of Language, Identity & Education, 4*(2), 119-135.

Rahman, T. (2007). Language planning in higher education: A case study of Pakistan. In: JSTOR.

Rahman, T. (2020a). English in Pakistan: Past, present and future. *Functional variations in English: Theoretical considerations and practical challenges*, 127-148.

Rahman, T. (2020b). Pakistani English. *The Handbook of Asian Englishes*, 279-296.

Rajkumar, A. S., & Swaroop, V. (2008). Public spending and outcomes: Does governance matter? *Journal of Development Economics, 86*(1), 96-111.

Ramachandran, R. (2012). Language use in education and primary schooling attainment: evidence from a natural experiment in Ethiopia. *IEB Working Paper 2012/34*.
Ramanathan, V. (2005). *The English-vernacular divide: Postcolonial language politics and practice* (Vol. 49): Multilingual Matters.
Ranis, G., Stewart, F., & Ramirez, A. (2000). Economic growth and human development. *World Development, 28*(2), 197-219.
Ratna, N., Grafton, R. Q., & To, H. (2017a). The 'Paradox of Diversity': Economic Evidence from US Cities 1980-2010. *Asia & the Pacific Policy Studies, 4*(1), 20-37. doi:10.1002/app5.162
Ratna, N., Grafton, R. Q., & To, H. (2017b). The 'Paradox of Diversity': Economic evidence from US cities 1980–2010. *Asia & the Pacific Policy Studies, 4*(1), 20-37.
Ratna, N. N., Grafton, Q., & MacDonald, I. A. (2012). Does multiculturalism pay? Empirical evidence from the United States and Canada. *Economic Papers: A journal of applied economics and policy, 31*(4), 401-417.
Ratna, N. N., Grafton, R. Q., & Kompas, T. (2009). Is diversity bad for economic growth?: Evidence from state-level data in the US. *The Journal of Socio-Economics, 38*(6), 859-870.
Ratna, R., Sethi, M., Abrol, S., Gupta, R., & Agrawal, U. (2014). ManageMent of cultural diversity in it sector. *Journal of Organisation and Human Behaviour, 3*(4).
Rehman, A., Jingdong, L., & Hussain, I. (2015). The province-wise literacy rate in Pakistan and its impact on the economy. *Pacific Science Review B: Humanities and Social Sciences, 1*(3), 140-144.
Reyes, O., & Jason, L. A. (1993). Pilot study examining factors asscociated with academic success for hispanic high school students. *Journal of youth and adolescence, 22*(1), 57-71.
Riaz, A. (2011). Madrassah education in pre-colonial and colonial South Asia. *Journal of Asian and African studies, 46*(1), 69-86.
Ricardo, D. (1822). *On protection to agriculture*: J. Murray.
Richards, J. C., & Schmidt, R. W. (2014). *Language and communication*: Routledge.
Robeyns, I. (2003). Sen's capability approach and gender inequality: selecting relevant capabilities. *Feminist economics, 9*(2-3), 61-92.
Rodríguez-Pose, A., & von Berlepsch, V. (2019). Does population diversity matter for economic development in the very long term? Historic migration, diversity and county wealth in the US. *European Journal of Population, 35*(5), 873-911.
Rong, C., & Abdullah, M. S. H. B. (2022). A Case Study of Second Language Acquisition: A Case Study of English Home Education Model for Children in China.
Rossi, P. E. (2014). Even the rich can make themselves poor: A critical examination of IV methods in marketing applications. *Marketing Science, 33*(5), 655-672.
Roy, M. (1993). The Englishing of India: Class formation and social privilege. *Social Scientist*, 36-62.
Rumberger, R. W. (1983). Dropping out of high school: The influence of race, sex, and family background. *American educational research journal, 20*(2), 199-220.
Sabir, M., & Abdullah, T. (2002). Gender and Public Spending on Education in Pakistan: A Case Study of Disaggregated Benefit Incidence [with Comments]. *The Pakistan Development Review*, 477-493.
Sah, P. K. (2022). English medium instruction in South Asia's multilingual schools: unpacking the dynamics of ideological orientations, policy/practices, and democratic questions. *International Journal of Bilingual Education and Bilingualism, 25*(2), 742-755.

Saher, A., Mehmood, R., & Farhad, A. (2023). Corpus based Investigation of Gender Representation in Education: A Content Analysis of Pakistani and Indian High Secondary Schools' Text Books. *Journal of Development and Social Sciences, 4*(1), 28-35.

Sahn, D. E., & Younger, S. D. (2000). Expenditure incidence in Africa: microeconomic evidence. *Fiscal studies, 21*(3), 329-347.

Sajjad, M., Munir, H., Kanwal, S., & Naqvi, S. A. A. (2022). Spatial inequalities in education status and its determinants in Pakistan: A district-level modelling in the context of sustainable development Goal-4. *Applied Geography, 140*, 102665.

Salmi, J., & D'Addio, A. (2021). Policies for achieving inclusion in higher education. *Policy Reviews in Higher Education, 5*(1), 47-72.

Scherf, R., & Weinzierl, M. (2020). Understanding different approaches to benefit-based taxation. *Fiscal studies, 41*(2), 385-410.

Schild, C.-J., & Wrede, M. (2015). Cultural identity, mobility and decentralization. *Journal of Comparative Economics, 43*(2), 323-333.

Schultz. (1999). Women's Role in the Agricultural Household: Bargaining and Human Capital.

Schultz, T. W. (1961). Investment in human capital. *The American economic review, 51*(1), 1-17.

Seal, A. (1968). *The emergence of Indian nationalism: Competition and collaboration in the later nineteenth century*: Cambridge University Press.

Seargeant, P. (2012). *Exploring world Englishes: Language in a global context*: Routledge.

Selowsky, M. (1979a). Target group-oriented food programs: Cost effectiveness comparisons. *American Journal of Agricultural Economics, 61*(5), 988-994.

Selowsky, M. (1979b). *Who benefits from government expenditure?* : Published for the World Bank [by] Oxford University Press.

Selvi, A. F., Yazan, B., & Mahboob, A. (2023). Research on "native" and "non-native" English-speaking teachers: Past developments, current status, and future directions. *Language teaching*, 1-41.

Semadeni, M., Withers, M. C., & Trevis Certo, S. (2014). The perils of endogeneity and instrumental variables in strategy research: Understanding through simulations. *Strategic management journal, 35*(7), 1070-1079.

Sen, A. (1999). *Economic policy and equity: an overview*: International Monetary Fund Washington, DC.

Shaban, A., & Cadene, P. (2023). Causality Between Cultural Diversity and Economic Growth in India: Cross-State Study, 1990–1991 through 2017–2018. *Society*, 1-14.

Shaban, A., & Khan, S. (2022). Cultural diversity, human capital, and regional economic growth in India. *Regional Science Policy & Practice*.

Shaeffer, S. (2019). Inclusive education: A prerequisite for equity and social justice. *Asia Pacific Education Review, 20*(2), 181-192.

Shah, D., Haider, G., & Taj, T. (2019). Causes of Dropout Rate at Primary Level in Pakistan. *International Journal of Curriculum and Instruction, 11*(2), 38-74.

Shallwani, S. (2019). Conceptualizing early schooling in Pakistan: perspectives from teachers and parents. *Early Childhood and Development Work: Theories, Policies, and Practices*, 133-152.

Shamim, F. (2008). Trends, issues and challenges in English language education in Pakistan. *Asia Pacific Journal of Education, 28*(3), 235-249.

Shamim, F., & Rashid, U. (2019). The English/Urdu-medium divide in Pakistan: Consequences for learner identity and future life chances. *Journal of Education and Educational Development, 6*(1), 43-61.

Sheeba, C. (2021). The Link between Mother Tongue and creativity. *International Journal of Modern Agriculture, 10*(1), 901-905.
Shukla, S. (1996). From pre-colonial to post-colonial: Educational transitions in southern Asia. *Economic and Political Weekly*, 1344-1349.
Sibanda, L. (2023). Strategies for Achieving Equity-Based Education: Towards an Equitable Education System. In *Social Justice and Culturally-Affirming Education in K-12 Settings* (pp. 133-152): IGI Global.
Sierens, S., & Van Avermaet, P. (2014). Language diversity in education: Evolving from multilingual education to functional multilingual learning. *Managing diversity in education: Languages, policies, pedagogies*, 204-222.
Skutnabb-Kangas, T. (2000). *Linguistic genocide in education--or worldwide diversity and human rights?* : Routledge.
Skutnabb-Kangas, T. (2006). Language policy and linguistic human rights. *An introduction to language policy: Theory and method*, 273-291.
Sleeter, C. E. (2012). Confronting the marginalization of culturally responsive pedagogy. *Urban Education, 47*(3), 562-584.
Soomro, K. A., Kale, U., Curtis, R., Akcaoglu, M., & Bernstein, M. (2020). Digital divide among higher education faculty. *International Journal of Educational Technology in Higher Education, 17*, 1-16.
Sotiriadou, P., Brouwers, J., & Le, T.-A. (2014). Choosing a qualitative data analysis tool: A comparison of NVivo and Leximancer. *Annals of leisure research, 17*(2), 218-234.
Spolaore, E., & Wacziarg, R. (2009). The diffusion of development. *The quarterly journal of economics, 124*(2), 469-529.
Steinberg, L., Blinde, P. L., & Chan, K. S. (1984). Dropping out among language minority youth. *Review of educational research, 54*(1), 113-132.
Steinlen, A., & Piske, T. (2022). Bilingual Programmes in Primary Schools. *English in Primary Education: Concepts, Research, Practice*.
Stibbard, R. (1998). *The principled use of translation in foreign language teaching.* Paper presented at the Translation & language teaching: language teaching & translation.
Stichnoth, H., & Van der Straeten, K. (2013). Ethnic diversity, public spending, and individual support for the welfare state: A review of the empirical literature. *Journal of Economic Surveys, 27*(2), 364-389.
Sun, B., Zhu, P., & Li, W. (2019). Cultural diversity and new firm formation in China. *Regional Studies, 53*(10), 1371-1384.
Takayama, K. (2016). Deploying the post-colonial predicaments of researching on/with 'Asia'in education: A standpoint from a rich peripheral country. *Discourse: Studies in the Cultural Politics of Education, 37*(1), 70-88.
Tamim, T. (2021). Language, Class, and Education: Deconstructing the Centre to Rethink Inclusivity in Education in Pakistan. *Cogent Education, 8*(1), 1897933.
Tanveer, H., Balz, T., Sumari, N. S., Shan, R.-u., & Tanweer, H. (2020). Pattern analysis of substandard and inadequate distribution of educational resources in urban–rural areas of Abbottabad, Pakistan. *GeoJournal, 85*, 1397-1409.
Tanzi, V., & Chu, K.-y. (1998). *Income distribution and high-quality growth*: Mit Press.
Teimouri, Y., Goetze, J., & Plonsky, L. (2019). Second language anxiety and achievement: A meta-analysis. *Studies in Second Language Acquisition, 41*(2), 363-387.
Teles, V. K., & Andrade, J. (2008). Public investment in basic education and economic growth. *Journal of Economic Studies*.
Thomas, W. P., & Collier, V. P. (2002). A national study of school effectiveness for language minority students' long-term academic achievement.

Tikly, L. (1999). Postcolonialism and comparative education. *Education, equity and transformation*, 603-621.
Tikly, L., & Barrett, A. M. (2011). Social justice, capabilities and the quality of education in low income countries. *International Journal of Educational Development, 31*(1), 3-14.
Tilak, J. B. (1987). *The economics of inequality in education*: Sage Publications India (Pvt) Ltd.
Todd, P. E., & Wolpin, K. I. (2007). The production of cognitive achievement in children: Home, school, and racial test score gaps. *Journal of Human capital, 1*(1), 91-136.
Tseng, C., Wu, B., Morrison, A. M., Zhang, J., & Chen, Y.-c. (2015). Travel blogs on China as a destination image formation agent: A qualitative analysis using Leximancer. *Tourism management, 46*, 347-358.
Tsui, A. B., & Tollefson, J. W. (2004). The centrality of medium-of-instruction policy in sociopolitical processes. *Medium of instruction policies: Which agenda*, 1-18.
Tupas, R. (2015). Inequalities of multilingualism: Challenges to mother tongue-based multilingual education. *Language and Education, 29*(2), 112-124.
Ugwoji, C. (2022). The Relationship Between Developmental Social Work, Poverty Alleviation, and Sustainable Development in Nigeria: Issues, Challenges, and Opportunities. In *Microfinance and Sustainable Development in Africa* (pp. 279-305): IGI Global.
Ullah, H., & Ali, J. (2018). Schools and Families: Reproduction of Class Hierarchies through Education in Pakistan. *Pakistan Journal of Criminology, 10*(3).
Ullah, H., & Skelton, C. (2013). Gender representation in the public sector schools textbooks of Pakistan. *Educational Studies, 39*(2), 183-194.
UNESCO. (2012). *Youth and skills: Putting education to work*. Retrieved from
Unesco, & Noss, R. B. (1967). *Higher Education and Development in South-east Asia: Language Policy; By Richard Noss*: Unesco and the International Association of Universities.
Unicef. (2021). *The state of the global education crisis: a path to recovery: a joint UNESCO, UNICEF and WORLD BANK report*: Paris: UNESCO, cop. 2021.
Van de Walle, D. (2002). *The static and dynamic incidence of Vietnam's public safety net*: World Bank Publications.
Van de Walle, D., & Nead, K. (1995). *Public spending and the poor: Theory and evidence*: World Bank Publications.
Van de Walle, D. P. (1995). Public spending and the poor: what we know, what we need to know. *What We Need to Know (June 1995)*.
Van Den Berghe, L., Pouille, A., Vandevelde, S., & De Pauw, S. S. (2024). Looking beyond primary barriers: Support workers' perspectives on school dropout among students with a migration background. *Journal of Ethnic & Cultural Diversity in Social Work, 33*(1), 34-46.
Van den Boer, M., & Zeguers, M. H. (2022). Beyond words: An analysis of skills underlying reading and vocabulary acquisition in three foreign languages. *Bilingualism: Language and Cognition, 25*(2), 321-336.
Vandenbussche, J., Aghion, P., & Meghir, C. (2006). Growth, distance to frontier and composition of human capital. *Journal of Economic Growth, 11*, 97-127.
Vegas, E., & Coffin, C. (2015). When education expenditure matters: An empirical analysis of recent international data. *Comparative Education Review, 59*(2), 289-304.
Victor, R. M. (2010). *Colonial education and class formation in early Judaism: a postcolonial reading* (Vol. 72): Bloomsbury Publishing.

Viswanathan, G. (2022). Colonialism and the Construction of Hinduism. *Wiley Blackwell Companion to Hinduism*, 1-20.

Wallis, W. A. (1936). The Poisson Distribution and the Supreme Court. *Journal of the American Statistical Association, 31*(194), 376-380.

Walter, S. (2009). Language as a variable in primary education. In: Arlington, TX: SIL International.

Wang, K., Zhao, S., & Jackson, E. (2020). Investigating exposure measures and functional forms in urban and suburban intersection safety performance functions using generalized negative binomial-P model. *Accident Analysis & Prevention, 148*, 105838.

Welch, D. E., & Welch, L. S. (2008). The importance of language in international knowledge transfer. *Management International Review, 48*, 339-360.

Williams, E. (2014). *Bridges and barriers: Language in African education and development*: Routledge.

Williams, P. E. (2003). Roles and competencies for distance education programs in higher education institutions. *The American Journal of Distance Education, 17*(1), 45-57.

Willig, A. C. (1985). A meta-analysis of selected studies on the effectiveness of bilingual education. *Review of educational research, 55*(3), 269-317.

Wong, K. M., & Benson, C. (2019). Language as gatekeeper for equitable education: Multilingual education in Cambodia. *Education, ethnicity and equity in the multilingual Asian context*, 69-86.

YAMEOGO, S. (2020). *Official language, ethnic diversity and industrialization in Africa.* KDI School,

Yang, M., & Lee, H. J. (2022). Do school resources reduce socioeconomic achievement gap? Evidence from PISA 2015. *International Journal of Educational Development, 88*, 102528.

Yasmin, F., Zaman, A., & Khan, K. (2023). Historical Perspective and Current Practices of Language in Education Planning in Pakistan. *PERENNIAL JOURNAL OF HISTORY, 4*(1), 62-81.

Yasmin, S., Eluru, N., & Haque, M. M. (2022). Addressing endogeneity in modeling speed enforcement, crash risk and crash severity simultaneously. *Analytic methods in accident research, 36*, 100242.

Yi, S. (2022). English in Asia: an Asian language or a lingua franca? Is English an Asian Language?, by Andy Kirkpatrick and Wang Lixun, eds. Queensland and Hong Kong: Cambridge University Press, 2021, viii+ 238 pp. ISBN: 978-1-107-13468-3. In: Taylor & Francis.

Yiakoumetti, A. (2012). *Harnessing Linguistic Variation to Improve Education. Rethinking Education. Volume 5*: ERIC.

Yip, D. Y., Tsang, W. K., & Cheung, S. P. (2003). Evaluation of the effects of medium of instruction on the science learning of Hong Kong secondary students: Performance on the science achievement test. *Bilingual Research Journal, 27*(2), 295-331.

Younger, S. D. (2003a). Benefits on the margin: evaluating alternatives to traditional benefit incidence analysis. *World Bank Economic Review, 17*(1), 89-106.

Younger, S. D. (2003b). Benefits on the margin: Observations on marginal benefit incidence. *The World Bank Economic Review, 17*(1), 89-106.

Zaman, A. (2008). Gender Sensitive Teaching: A Reflective Approach for Early Childhood Education Teacher Training Programs. *Education, 129*(1).