University of Groningen

The education divide in Indonesia

Muttaqin, Tatang

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Introduction

1.1 Introduction

On 11 June 2014, a story was published on the official Semarang State University (Unnes) website[1] reporting of a moment of inspiration concerning a young Indonesian woman, in a black gown and cap, who rode to her graduation ceremony in a rickshaw pushed by her father. Raeni (21 years), the daughter of Mugiono (55 years), a rickshaw driver, became the most popular university graduate of about 5 million university students in Indonesia that year. Raeni grew up in a poor family in Kendal, Central Java, and after graduating from vocational school; she was accepted in Semarang State University (Unnes) and received a scholarship from the Ministry of Education and Culture (MoEC) as recognition of her scholastic achievements. She finished her degree in accounting education with an almost perfect grade point average of 3.96 out of 4.0.

This story spread massively in both print and electronic mass media and caught the attention of President Susilo Bambang Yudhoyono, who invited Raeni and her father to meet him and his wife at the State Palace in Jakarta, where they presented her with a presidential scholarship for continuing her study in the United Kingdom. Why is Raeni's story so inspiring and why did it spread across country? Because her story represents an exception in an educational system in which the poor, no matter how academically talented, have little or no chance of advancing to university. Often, the poor do not continue to public high school, which is highly competitive, and some of them have already dropped out in elementary school or never set a foot in a school.

Raeni's story shows the importance of equal opportunities concerning access to and quality of education in Indonesia. Access to education impacts an individual's life because it has the potential to improve the ability to think critically, to solve problems and to make appropriate decisions (UNICEF, 2015). But for education to have these effects, it needs to be of good quality. Therefore, governments often seek to simultaneously improve access to and quality of education for all citizens. The Indonesian government is no exception. Although its efforts had noticeable impact, many of the targets to improve access to and quality of education nevertheless still have not been reached (Lundine, Hadikusumah, Sudrajat, 2013).

The remainder of this introduction will give a short overview of these efforts and sometimes contradictory scientific evidence about their effectiveness. This leads to the formulation of the research questions of the four studies in this dissertation, followed by a sketch of the overarching analytical framework that guides the empirical research in the studies in this book.

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[1] https://unnes.ac.id/berita/diapresiasi-publik-raeni-peroleh-tawaran-beasiswa-s2-ke-inggris/

1.2 Government efforts to improve access to and quality of education in Indonesia

The formal school system in Indonesia comprises of primary to higher educational levels. The combination of 6 years primary school (grades 1-6) and 3 years junior secondary school (grades 7-9) results in 9 years compulsory basic education. After completing basic education, students continue to 3 years senior secondary school (grades 10-12) and higher education. However, before enrolling in primary school, some children attend formal or nonformal preschools. Formal preschools, such as kindergartens (*Taman Kanak-Kanak/Raudhatul Atfhal*), concentrate on learning and have structured ways of teaching, whereas non-formal preschools, such as play groups (*Kelompok Bermain*), emphasize learning through playing (Yuniarti & Hakim, 2014; Hasan, Hyson, & Chang, 2013).

This section briefly discusses several governmental programs that focus on reducing disparity in access to and quality of education in Indonesia.

1.1.1 *Expanding access to preschool*

To improve the access of poor children to preschools, the government has implemented the early childhood education and development project (ECED). This project ran from 2006 to 2012 and covered 738,000 children from 6,000 poor communities situated in 3,000 villages (Pradhan, Brinkman, Beatty, Maika, Satriawan, de Ree & Hasan, 2013). It aimed to enhance poor children's development and their readiness for entering primary school. Three main interventions were used: (1) training for facilitators to promote community awareness regarding the importance of preschools and to learn to prepare proposals for financial subsidy; (2) subsidies to establish two preschools; (3) training two preschool teachers per center (Hasan *et al.*, 2013).

To complement the program at the village-level, the government also financed the national program for community empowerment (*Program Nasional Pemberdayaan Masyarakat,* PNPM). This program provides incentives to communities exceeding certain preschool enrollment thresholds. This government effort contributed to increase preschool participation of children in the age of 4 and 5 years from 30 percent in 2005 (CBS, 2005) to 51 percent in 2012 (World Bank, 2015).

1.2.2 *Universal education*

The constitution of Indonesia states that every citizen shall have the fundamental right to obtain education. But it was only in 1973, when national income increased through the oil boom, that the government started to take measures in this direction (Presidential Instruction No. 10/1973 on the Primary School Construction Program, INPRES SD). A program was designed to make sure that all children in the age of 7 to 12 years have access to school, particularly in rural, transmigration, new settlement and disadvantaged urban

areas. This endeavor dramatically improved the enrolment rate of primary school and junior secondary school students from 41 percent and 17 percent in 1968 to respectively 99 percent and 47 percent in 1988 (Attachment to President's speech, 1993).

In 1984, the government launched a six-year compulsory education policy. This was followed, in 1994, by the introduction of a nine-year compulsory education system (Arina, 2011). In July 2005, the government introduced a *Free Basic Education* program (FBE) (Paqueo & Sparrow, 2005), and started providing a school assistance fund (*Bantuan Operasional Sekolah,* BOS) for children in primary and junior secondary education (MoEC, 2009). In 2013, the government began extending universal education from nine to twelve years (MoEC, 2013). However, since 2006, there has been little progress in reducing the number of children who are out of school (CBS, 2011). Furthermore, there is only a slight decrease in the percentage of children who leave school before reaching the last grade of their nine-year compulsory education.

1.2.3 Targeting the poor

The government took four measures to improve school access and educational attainment of children from low-income households. First, in order to buffer the hardship resulting from the economic crisis that began in 1997, the government implemented a social safety net (SSN) program to maintain school enrolment rates and transition rates, to reduce dropout rates and to maintain the quality of the teaching and learning process. The SSN program consists of a scholarship for the poor and a school subsidy (Sparrow, 2007; Sumarto, Suryahadi & Widyanti, 2002).

Second, the school operational assistance (BOS) program, introduced in 2005, provided subsidies for both public and private schools, helping them to maintain their quality of service despite rising prices of school supplies. This fund also helped the schools to pay teacher salaries and supplies when parents had difficulties in paying school fees.

Third, to anticipate negative effects of reducing the fuel subsidy, in 2005, the government implemented an unconditional cash transfer program (*bantuan langsung tunai*/BLT). Two years later cash transfers became conditional and were restricted to the domains of health, nutrition and education (*Tim Penyusun Pedoman Umum PKH*, 2007). For instance, poor households with children in the age of six to 15 received cash if their children enrolled in primary or junior secondary schools with an attendance rate of at least 85 percent.

Fourth, in 2014, the government introduced the Indonesia smart card (*kartu Indonesia pintar*/KIP). It covered about 24 million poor students, including students eligible for scholarships and others that cannot attend school because of financial issues. Recipients could withdraw funds from the card in the appointed bank outlets.

1.2.4 Improving scores in the national examinations

Since 1965, the Ministry of Education and Culture (MoEC) annually conducts national examinations (*ujian nasional*/UN) for primary and secondary school levels to assess and standardize students' performance (Fatchiati, 2015; Afrianto, 2008). Since 2005, national examinations are held by the Board of National Standards of Education (*Badan Standar Nasional Pendidikan*, BSNP) via the provinces and sub-district education offices at the end of each school year (about April or May).

The objectives of the national examination are: (1) mapping the competency and quality of Indonesian national education; (2) setting a basis for selection criteria for entrance to high education level; (3) a monitoring instrument to identify weak schools, so that special measures can be taken to improve their quality (MoEC decree 75/2009).

1.2.5 Decentralizing the education system

In 2001, the government also decentralized education by increasing local government autonomy and by allocating more resources to the level of districts and cities (*Budget Statistics* 2006-2012). This policy enables local governments to improve public services, particularly in the educational sector, because it is stated in the constitution that governments are obliged to allocate a minimum of 20 percent of their budgets to education. Additionally, more than 2.6 million public servants were transferred from the management of the central government (MoEC) to the municipalities and schools. More than three quarters of these public servants are teachers (World Bank, 2003).

1.3 The problem: persistent gaps in quality of and access to education in Indonesia

Even though the Indonesian government has made various efforts to reach the target of universal education, the objectives of increasing both access to and quality of education, while reducing inequalities, are far from accomplished. First, inequality still is a problem. In the age cohort from 13 to 15 years, 96 percent of students from wealthy households finish their education in 7 years. This figure drops to 80 percent for students from poor households (CBS 2016 calculated by Bappenas). Second, with regard to *access*, there are still more than half a million children in the age of 7 to 15 years who had never set foot in a school in their entire life, and more than 1,7 million children in total left school before completing their nine-year compulsory education (CBS, 2011). Third, in terms of competence, 55 percent of Indonesian students' scores below average according to the Programme for International Student Assessment (PISA), 43 percent scores average, and only 2 percent scores above average (OECD, 2012; World Bank, 2014). Fourth, as far as

quality is concerned, national exam scores of students in private schools are still lower than those of their peers in public schools (Newhouse & Beegle, 2006), and there are also large variations within and between Islamic private schools.

Identifying appropriate policies to mitigate these problems requires insight into the potential antecedents behind variations in access and quality of education (MoEC, 2015). A large body of studies has pinpointed a wide range of such antecedents, including differences in school ownership (public and private), regional differences, and differences in the socio-economic status of families (Al-Samarrai, 2013; Suharti, 2013; Suryadarma, 2010; Newhouse & Beegle, 2006). In addition, the transformation of Indonesia's political and administrative system, especially after the decentralization, also was found to play a role, although previous studies yielded contradicting results. On the one hand, decentralization improved educational outcomes, such as mean years of schooling and literacy rates (*e.g.* Simatupang, 2009; Usman, 2001). On the other hand, it increased school costs (*cf.* Kristiansen & Pratikno, 2006).

The above scholarship shows the multifaceted and complex interrelationship between educational attainment and inequality. Their interplay is not only related to individual factors, such as gender, but also to human capital (parental education and occupation), economic capital, social capital and government interventions at various levels. For example, one could wonder how household and village social capital – an understudied topic in the Indonesian context - links to preschool enrollment. At the national level an important question is how political capital and the transfer of resources and authority to the local level affect inequality in educational attainment. A better understanding of the interplay between this large range of resource inequalities at different administrative levels, in turn, is pivotal for finding effective policy solutions (Lynch & Baker, 2005).

This dissertation aims to provide answers to these yet unanswered questions by disentangling the complex and multifaceted phenomenon of inequality in access to and quality of education in Indonesia. The central research question of this dissertation therefore reads: *To what extent and how do individual, household, school, community and government level characteristics, in particular variation in resources, influence unequal access to and quality of education in Indonesia?*

1.4 Access to and quality of education: a multilevel, multi-resource framework

Educational inequality can be measured by diverse dimensions, such as access to education, student performance, and earning in later life (*see e.g.* Breen, Luijkx, Müller, & Pollak, 2009; Pfeffer, 2008; Blau & Kahn, 2005; Shavit & Blossfeld, 1993). This book focuses on inequalities in educational access and student achievement. Access is

measured by preschool and school enrollment (or dropout), and mean years of schooling. Student test scores are used as a measure for achievement.

Since the allocation of resources is one of the major tools a government has to affect educational outcomes, a resource perspective provides the point of departure for the analyses in this book. Resource or opportunity based explanations have successfully informed research in a variety of domains, including the educational sector. What is considered a "resource" differs between the approaches. In general, the *Opportunity Structure Approach* (Roberts, 2009; Merton, 1968) in sociology and the *Resource Based View* (Wernerfelt, 1984) in organization research use a very broad definition of resources. For example, the latter conceives resources as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm" (Draft, 1983 in Barney, 1991: 101). This definition includes a bundle of tangible and intangible assets, such as management skills, organizational processes, information and knowledge. In contrast, the *Education Production Function Approach* (Hanushek, 2007) focuses on student achievement as a function of the school's investments in activities and resources related to teaching, like time for instruction. Similarly, more specific frameworks, like *Human Capital* (Becker, 1993) or *Social Capital Theories* (*e.g.* Mladovsky, 2014; Song & Lin, 2009; Beard, 2005) focus on a narrower set of resources.

The studies reported in this book follow this lead. More specifically, it explores how educational outcomes are related to investments and endowments in five broad categories of resources. These different types of resources are distributed across multiple societal levels. In our study, six of these levels are distinguished (the individual student, his or her household, the school, the village, the municipality and the national level).

First, *human capital* refers to the characteristics of a student's parents, such as parental education and occupation. In terms of occupational status, we consider whether a parent has a high-status job (such as being a civil servant, a lawyer or a doctor), or whether one has low-status occupations (i.e. a farmer and a worker). For our analyses, we use aggregated information about human capital in the household, school, and municipality.

Second, the types of *economic capital* differ across levels of analysis. At the level of the household, key indicators are income, educational expenditure and the poverty status of parents. At the school level, the level of economic capital is inferred from variations in investments into the quality and intensity of the primary process of teaching, like the selection and training of teachers. At the level of the village, we conceive average wealth from the average household expenditure per capita adjusted by the municipal-level poverty rate. At municipal-level, we include average wealth, government education expenditure, average household education, poverty rate and fiscal capacity as indicators of economic capital.

Third, *social capital* reflects the structure of relations that facilitate individuals to share information, strengthen reciprocity and foster trust. We use social capital indicators at the level of the household and at the level of the village. Household level social capital

consists of: (1) association that facilitates the diffusion of information and may result in adopting behavior of others; (2) trust in institutions and other people in the community; and (3) reciprocity as indicated by the easiness to borrow or lend money from others for emergency needs. In order to assess variations in village level social capital, we aggregate information on household social capital.

Fourth, we refer to investments into infrastructures, like accessibility of schools and access to mass media, as the *infrastructural capital* at the level of the household, village and the municipality. The distance to travel to school can hinder school accessibility. Therefore, children have to make great efforts to get to school, particularly in rural and remote areas with poor transportation infrastructures. In addition, though the government has increased access to radio and television as a way to promote (ideological) unity and exert government influence (power) in peripheral areas, there are still remote areas that cannot be reached by mass media. To assess variations in access to mass media at the village level, we aggregate data on household access to mass media.

Finally, we analyze the decentralization induced changes in *political capital* as the shift of authority, responsibilities, financial and human resources to the municipal level. This includes the implementation of direct elections of regents and mayors, and the creation of new municipalities. Figure 1.1 gives an overview of the different types of capital and levels of analysis studied in this dissertation.

Table 1.1 Resources based view across levels and contextual factors

Capital➲ Level	Economic	Human	Social	Infrastructure	Political
National					Policy to decentralize education.
Municipal	Wealth; mean of household education expenditure; public education expenditure; poverty rate; fiscal capacity.	Proportion of parent from a senior/higher education background; Proportion of parents with a high-status occupation.	Type & level of development; urbanization.	Number of schools.	Newly created municipalities.
Village	Mean of wealth.		Association; trust; reciprocity; urbanization.	School availability; access to mass-media.	
School	Investments in teaching time, teacher selection, financial support to students.	Proportion of parents with a senior/higher education background; Proportion of parents with a high-status occupation.\n\nInvestments in teacher training.			
Household	Expenditure per capita, education expenditure; poverty status.	Head of household education background; parental education.	Association; trust; reciprocity.	Access to mass-media.	

This multilevel multi-resource framework allows to systematically address one of the most pressing policy issues related to educational attainment: to what degree can a specific kind of resource deficiency that hampers access to and quality of education be compensated by access to resources of another type or from another level?

Three types of interplay can be distinguished. The first refers to *within-level cross-resource effects*. For example, if a lack of household economic capital may inhibit enrolling kids at school, can household social capital compensate for this lack of resources? The second refers to *between-level single-resource* effects. For example, under which conditions might school or municipality level economic capital offset a lack of economic resources at the household level? Finally, there are *between-level cross-resource effects*. For example, to what degree may a low degree of human capital at the household level be compensated by school level economic capital like investments in teacher education? The four studies in this book explore a large variety of these effects.

Although much progress has been made in understanding the combined effects of various resource investments in education (*e.g.* Suharti, 2013; Saraswati, 2012; Newhouse & Beegle, 2006), it is still unclear how the interplay between resource investments at household, village, school, and municipality-level jointly affect variations in educational outcomes in the context of decentralization of the Indonesian public sector.

Policy makers could opt to intervene in almost all levels in an attempt to reduce inequalities in education. Utilizing a resource-based approach, this study provides a comprehensive picture for policy makers to identify what kind of resources at which level might be needed to reduce educational inequality, and what type of stakeholders are involved and needed to contribute to government efforts to narrow this inequality.

1.5 Applying the framework: four studies

The four empirical chapters in this dissertation investigate the impact of differences in resources (at the individual, household, school, village and municipality-level) on four aspects of access to and/or quality of education: 1) Children dropping out of school or never attending school; 2) Preschool participation; 3) School participation and length of schooling; 4) Student achievement and achievement gaps. Figure 1.2 provides a conceptual model of the four studies.

Figure 1.2 Visual summary of research elements in dissertation
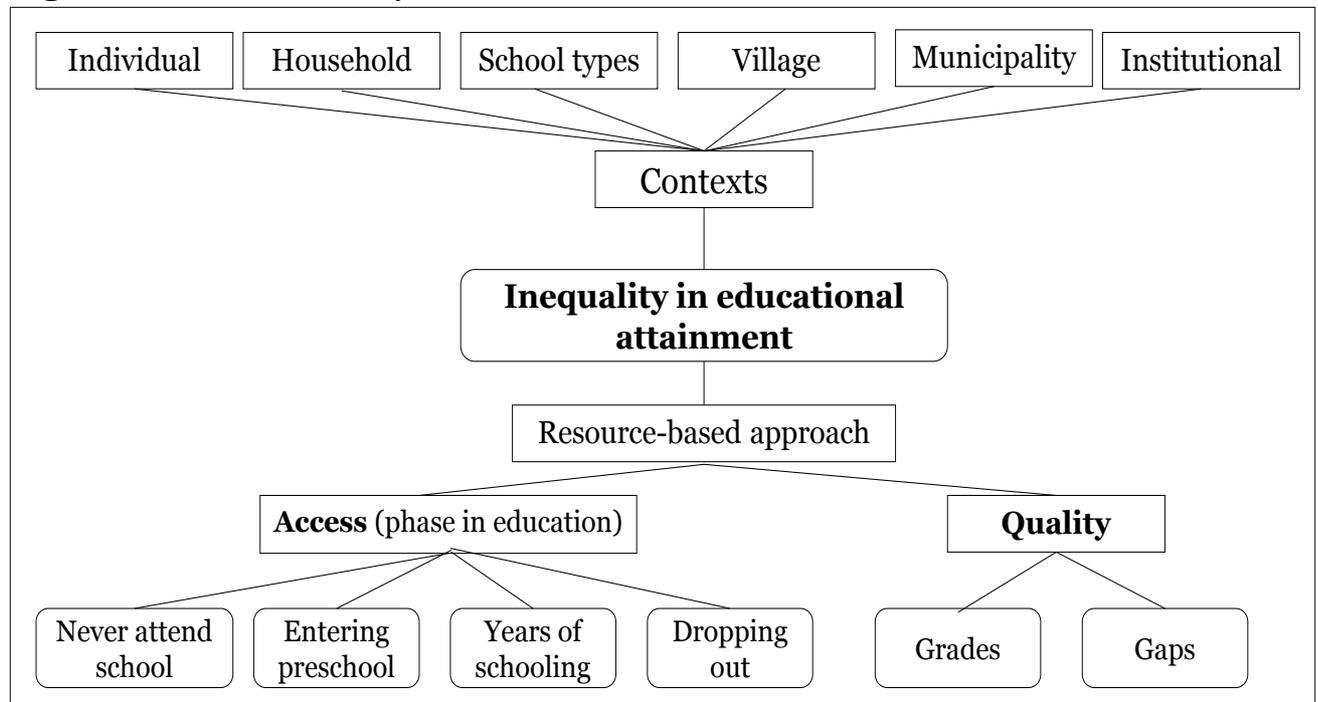
1.5.1. Being out of school: municipality and household level antecedents

Unlike in developed countries, lack of money for education at the household level is still a salient factor in developing countries. Many factors can stimulate or hamper school enrollment. On the one hand, governments could commit resources to provide free education for low-income children to address this issue. The Indonesian decentralized educational system depends heavily on municipalities (districts and cities as the autonomous local governments) that have the authority and resources to manage primary and secondary education services that could explain why some children are in school and others not (Colclough, Rose, & Tembon, 2000).

On the other hand, economic revival can create temporary job market opportunities that may result in students *dropping out of school* (Gangl, 2002; Allensworth, 2005). Also accessibility problems as they may result from physical disability or living in remote areas could also be obstacles that cause large groups of children to never attend school (Shindler, 2010; Arunatilake, 2006). Last but not least, household resources and characteristics will also influence children's opportunities to attend school (Rumberger & Larson, 1998; McNeal, 1999; Pong & Ju, 2000).

An underexplored question in previous studies is to what degree municipality and household resources contribute to decrease the number of children never attending or dropping-out from school. Therefore the first sub-question of this dissertation is: *Which characteristics at the level of municipalities, households and children help to explain*

why children never attend or drop out from school in Indonesia? This question is addressed in Chapter 2. Building on an opportunity structure approach (Roberts, 2009), it focuses on educational opportunities and constraints, particularly in terms of available resources at the municipal level (such as government education expenditure, poverty rate, mean of household education) and the household level (such as parental wealth and education, education expenditure and school availability near the house).

This chapter enriches previous research on children that are out of school (Shahnaz & Naeem, 2012; Suliman & El-Kogali, 2010; Shindler, 2010; Arunatilake, 2006) in three ways. First, it elucidates to what degree never attending school and dropping out of school are associated with the same antecedents (Shindler, 2010). Second, whereas previous studies have mainly focused on explanations based on characteristics of the individual, the family or the community (cf. Wenger, 2002; Rumberger, 2004; Allensworth, 2005; Anderson, 2010), this chapter also incorporates municipality factors. Third, the application of multilevel analysis allows us to examine cross level multiple resource effects on both dropping out and never attending school.

1.5.2. Preschool participation: household and community level antecedents

Indonesia has low preschool participation rates (World Bank, 2015). Studies show that parental resources are crucial for preschool enrolment (Hasan *et al.*, 2013; Self & Grabowski, 2008; Alderman, 2006; Knight & Song, 2000). In developed countries, next to parental SES, social capital was found to improve enrolment rates (Smith, Beaulieu & Seraphine, 1995; Teachman, Paasch & Carver, 1996). Indonesia has dense social networks and community organizations (Lasagni & Lollo, 2011), which can buffer the lack of economic resources (White & Kaufman, 1997) or may complement other forms of capital (Robison, Schmid, & Siles, 2002) which may cause the low preschool participation rate. For example, social capital may contribute to the effectiveness of policies aiming to enhance preschool enrolment through social and financial support. Nevertheless, little is known about the link between social capital and educational outcomes. Chapter 3 therefore addresses the second sub-question of this dissertation: *To what extent and under which conditions can variations in preschool participation be explained by differences in household-level and community-level resources, and what is the moderating role of social capital?*

By including the effects of social capital both at household and community-level, this chapter fills a gap in current scholarship on preschool participation in Indonesia, in which these aspects have so far received little attention (e.g. Hasan *et al.*, 2013; Self & Grabowski, 2008; Barnett & Yarosz, 2007; Alderman, 2006). In addition to main effects of social capital, this chapter investigates the interplays between SES and social capital within the household level.

Furthermore, moderation analysis allows disentangling the potentially complementing and compensating effects of social capital. Complementing effects of social capital suggest to strengthen the effects of other resources (Song & Lin, 2009). Compensation effects of social capital can buffer lack of other resources (Mladovsky, 2014). For instance, can social capital compensate low parental income and education? And, under which community conditions are the effects of social capital weakened or strengthened (i.e. cross-level interaction effects)?

1.5.3. Educational attainment: provincial and municipal level antecedents

With the decentralization of the educational system, local governments acquired a more central position in the allocation of political and financial resources to education services. However, there is disagreement about how decentralization may impact educational outcomes. On the one hand, decentralization enables the local government to properly respond to local demands to improve educational services (Simatupang, 2009; Heredia-Ortiz, 2007).

Proponents of educational decentralization therefore predict rising enrollment rates, mean years of schooling, adult literacy rates, female literacy rates, and decreasing dropout rates (Simatupang, 2009; Galiani & Schargrodsky, 2002; Habibi *et al.,* 2001). Conversely, opponents predict a negative impact on educational outcomes and increasing school costs (Kristiansen & Pratikno, 2006; Treisman, 2000). In an attempt to settle this issue, this study investigates under which conditions variations in local government resources relate to educational attainment. Chapter 4 therefore addresses the third sub-question of this book: *To what extent did the decentralization of Indonesia's educational sector affect (variability in) educational attainment at the provincial and municipal levels?*

This chapter contributes to the existing literature on education in Indonesia by presenting the first "before and after analysis" of the impact of decentralization on regional variations in educational attainment. This study also provides insight of the effect of decentralization on regional inequality which may be helpful in developing context-specific policy interventions aimed at reducing regional disparities in the Indonesian setting.

1.5.4. Student achievement: school level antecedents

Differences in resources also affect the quality of education in terms of student achievement, and they may lead to achievement gaps. Previous research emphasizes differences between public and private schools (*e.g.* Bernardo, Ganotice, & King, 2015; Braun, Jenkins, & Grigg, 2006; Newhouse & Beegle, 2006), but paid relatively little

attention to differences *between* private schools, in particular between Islamic private schools. These differ considerably in terms of ideological orientation ("stream": modernist, traditionalist, integrationist) and organizational arrangements ("track": madrasah versus non madrasah schools). We argue that these ideological and organizational profiles reflect considerable differences in resource allocation decisions, i.e. the degree to which investments are made into the primary process, like teacher selection and training. We expect these differences to affect student achievement. Chapter 5 therefore asks: *How can variations in the (gender and parental socio-economic status related gaps of) academic achievement of students attending private Islamic schools be explained by ideological and organizational differences of their schools?*

Using an education production function approach (Hanushek, 2007), this chapter argues that schools investing more into the primary process of teaching (*e.g.* through time investment, selection and training of teachers) will produce students with better outcomes on national exams. Additionally, this study examines achievement gaps by conducting interplays *between level single resource* effects and *between levels cross resource effects*.

Using interaction analyses, we expect that one resource can be complementary or compensatory (buffer) of the other resources. For instance, implementation of single sex education in the madrasah track and integrationist stream may reinforce the gender achievement gaps. In terms of the SES gap, financial support for low SES students via scholarships could improve attendance in the non-madrasah track and the Traditionalist and Modernist stream, which may reduce achievement gaps.

1.6   Research design and data

We use and combine various nation-wide surveys and administrative datasets from five different sources: (1) Central Bureau Statistics (CBS), (2) Ministry of Education and Culture (MoEC), (3) Ministry of Finance (MoF), (4) Ministry of Development for Disadvantaged Region (MDDR) and (5) Ministry of Home Affair (MoHA). In addition, we collected primary data from expert interviews with heads of Traditionalist, Modernist and Integrationist non-governmental umbrella organizations in Indonesia. In most chapters, we made combinations of various datasets in order to extract the required multilevel information necessary to answer our research questions with multilevel data analysis techniques. Below the main data sources are discussed.

1.6.1. National socio-economic survey (Susenas 1996-1999 and 2008-2011)

Several chapters make use of the rich dataset provided by the national socio-economic survey (Susenas), conducted by the Indonesian *Central Bureau of Statistics* (CBS). This

survey monitors key indicators of social and economic development in Indonesia. It started in 1963 with 16,000 households in the sample. During 1963-1978, it was conducted every two years (the Core). Since 1992 the core module is collected annually. Modules on special topics are added every three years. In 2011, the Susenas covered 285,307 households, which comprised 1,118,239 individuals (CBS, 2011). The annual Core covers eight indices: demography, health, education, labor, fertility, family planning, housing, and consumption. The Module is divided in three clusters: (1) social, culture and education; (2) housing and health; (3) household consumption and expenditure (CBS, 2013). The survey initially uses a stratified multi-stage cluster sampling with two strata (urban and rural) for each municipality.

Then, it follows a two-stage cluster sampling strategy for urban areas by dividing them into census blocks (CBs) and then to select a number of CBs using linear systematic sampling. In rural areas, a number of sub-districts are sampled using probability proportional to size of population. For each selected CB, sixteen households are selected to be interviewed by using linear systematic sampling (CBS, 2011; Hull, 2013). We used the Susenas data to examine the effects of various forms of capital on education inequality, such as human capital (parental education and occupation) and economic capital (education expenditure and poverty status of parents) at the household and municipal level, and social capital (association, trust and reciprocity) at the household and village level.

1.6.2. Village potential (Podes, 2011)

Since 1980, the CBS also compiles the so-called Village Potential (Podes) dataset as part of the population census. In 2011, *Podes* covered 75.410 villages. It contains general information about villages, such as the village population, employment, housing and environment issues, education, health, socio-cultural aspects, transportation, communication, information, land usage, economy, security, village autonomy, community empowerment programs, village apparatus, agriculture, and supporting factors and obstacles (Hull, 2013). In terms of education, it covers information on the numbers of educational institutions, ranging from preschool to university, general and religious, and public and private schools/universities. We use the *Podes* data to study the availability of schools in the village and to acquire information about school distance.

1.6.3. National examination dataset (MoEC, 2013)

National examination data is administered by the Education Assessment Centre of the Research and Development Board, which is part of the MoEC. The data covers the national exam scores of all four national exam subjects (Mathematics, Science,

Indonesian and English) at the junior secondary school level. Along with the scores, the dataset provides information about the gender and age of the students, their parental education and occupation, school names and locations. In 2013, the dataset consisted of 3,671,863 students nested in 48,962 schools, both public and private, and madrasah and non-madrasah. We used the data to investigate the effects of human capital and economic capital at household, school and municipal level on student achievement and achievement gaps in various tracks and streams in private Islamic schools.

1.6.4. Local government expenditure/LGE (MoF, 2013)

The Ministry of Finance (MoF), via the Directorate General of Regional Budgeting (MoF, 2013), offers electronic access to the local government expenditure (LGE) dataset. It covers local government expenditure (LGE) data, classified into nine dimensions: (1) general services; (2) order and peace; (3) economy; (4) environment; (5) housing and service facilities; (6) health; (7) tourism and culture; (8) education; and (9) social protection. We used the LGE dataset to investigate the effect of municipality education expenditure on education inequality.

1.6.5. Fiscal capacity index (MoF, 2011)

The requirement to report information of the local government's fiscal capacity originates from a decree of the Minister of Finance (MoF) No.244/PMK.07/2011. We used this fiscal capacity index to investigate the effect of municipality fiscal capacity on municipality educational attainment.

1.6.6. Municipality development (MDDR, 2011)

The municipality development dataset refers to data on 183 underdeveloped municipalities. The MDDR was issued by the Ministry for the Development of Disadvantaged Regions (MDDR) in 2011. It defines underdeveloped municipalities on the basis of six criteria: economy, human development index, infrastructure, fiscal capacity, accessibility and other local characteristics. We merged the municipality development data of the MDDR with the Susenas dataset, and classified the municipalities in three types: city, developed district and underdeveloped district.

1.6.7. Newly created municipalities (MoHA, 2008-2011)

Information of newly created municipalities was retrieved from the Ministry of Home Affairs (MoHA). Based on an updated list of the number of municipalities for 2008-2011, newly created municipalities could be identified. We used this data to examine whether there are differences between 'old' and 'new' municipalities and whether this affects municipality educational attainment.

1.6.8. Expert interviews with heads of Traditionalist, Modernist and Integrationist organizations

For the chapter on differences in resource investments in different tracks and streams in private Islamic schools, we interviewed the Vice Chairman of the Primary and Secondary Education Council of Muhammadiyah (*Modernist)*, the Vice Chairman of *Lembaga Pendidikan Maarif Nahdatul Ulama*/NU (*Traditionalist*, and the Chairman of *Jaringan Sekolah Islam Terpadu*/JSIT (*Integrationist*). These experts provided crucial background information about the streams' vision and mission and how the schools incorporate the national curriculum. In addition, the experts informed the researcher on the number of teaching hours, teacher training, teaching qualification, extra attention for specific subjects, investments in coordination, financial or other support for low SES pupils, and implementation of single sex classes. We also consulted these experts to crosscheck the schools' membership to one of the three streams and one of the two tracks.

Table 1.2 provides a summary overview of the empirical chapters, research design and data.

Table 1.2 Summary of the empirical chapters of the dissertation

Chapter	Research question	Dependent variable	Data source and design
2	Which characteristics at the level of municipalities, households and children help to explain why children never attend or drop out from school in Indonesia?	School enrolment: (1) never attended school; (2) attending school; (3) drop-out.	▪ National socio-economic survey (Susenas, 2010). ▪ Village Potential (Podes, 2011). ▪ Local government expenditure/LGE (MoF, 2013). Multilevel multinomial regression analysis
3	To what extent and under which conditions can variations in preschool participation be explained by differences in household- and community-level factors - such as SES, modernization and urbanization – and what is the moderating role of social capital?	Preschool enrollment.	▪ Susenas, 2009. ▪ Village Potential (Podes, 2011). Multilevel logistic regression analyses.
4	To what extent did the decentralization of Indonesia's educational sector affect (variability in) educational attainment at the provincial and municipal levels?	Length of schooling.	▪ Susenas 1996-1999 and 2008-2011). ▪ Municipality development (MDDR, 2011). ▪ Newly created municipalities (MoHA 2008-2011). ▪ Fiscal capacity index (MoF, 2011). Multilevel regression analyses
5	How do various streams and tracks in Islamic private schools affect students' academic achievement and reducing achievement gaps across gender and parental SES?	National examination (NE) scores of Mathematics, Science, and English.	▪ National examination dataset (MoEC, 2013). ▪ Susenas, 2010. Multilevel regression analyses.

1.7 Contributions

This book contributes to the sociology of education in at least three ways. First, this dissertation is among the first to use a multilevel multi-resource framework to generate systematic quantitative evidence on the determinants of unequal access to and quality of education in Indonesia. This allows a more fine grained exploration of the complex interplay between different levels and different types of resources, and their effect on inequality in access to and quality of education. The propositions and findings concerning *within-level cross-resource effects, between-level single-resource effects* and *between-levels cross-resource effects* may also be useful in guiding future research on educational inequality in other countries.

Second, in terms of institutional change, this study is among the very few that tries to trace how Indonesia's "big bang" decentralization affects educational outcomes through time.

Finally, this study draws on an exceptionally large body of different large scale datasets from different sources. The combination of several of these datasets allowed us to achieve an exceptionally high degree of contextualization both with regard to a large number of levels of analysis and policy making (the individual, household, school, community, municipality and province), as with regard to a broad range of resources and capitals (economic, human, social, infrastructure, and political capital). This encompassing multilevel multi-resource framework provides researchers and policy makers with a more complete picture of the determinants of access to and quality of education in Indonesia. The findings of the studies, therefore, may assist policy makers to carefully think through policy and budget allocation decisions while attempting to further improve access to and the quality of education in Indonesia.