

THE KENYAN AND ITALIAN MIDDLE LEVEL SCHOOLS:

A comparative analysis accounting for the variations in the quality of education in the sixth grade level.

Sarah Gakii Nkarichia

Email address: sarahgakii@libero.it

ABSTRACT

This work is a comparative analysis accounting for the variations in the quality of education among the 6th year pupils in the compulsory school in Kenyan and Italy. In the Kenyan education system structure 6th year refers to standard six of the upper primary school, which is equivalent to “prima media” of the Italian lower secondary school.

The analysis consists of a quantitative and a qualitative part. The quantitative part refers to the research surveys carried out in Kenya by Sacmeq (2007 -2011) and in Italy by Invalsi (2011-2012). The qualitative part refers to a direct research survey carried out in Bergamo province and an indirect one carried out online in Meru and Nairobi counties in Kenya. School and pupil level factors that contributed to the variations in reading and mathematics were examined.

Our research shows that in Kenya at the *pupil* level; grade repetition, socio-economic background, pupil age, sex and at *school* level; school resources and location were found to be the most important factors affecting the variations in pupil achievement. Whereas in Italy at *pupil* level; socio economic- cultural background, sex, age, origin and at the *school* level; school location were identified as common contributors to the variations in the performance.

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INTRODUCTION

The aim of this work is to compare the factors accounting for variations in the quality of education in the sixth year of the compulsory school in the Kenyan and Italian school systems. Particular attention will be focused on pupil and school level factors influencing the scores for reading and mathematics.

The idea of this work came up after reading an article in one of the Kenyan newspaper during the release of a research report by Sacmeq (Southern and Eastern Africa Consortium for Monitoring Educational Quality) in year 2010. It stated that the Kenyans schools were among the best performers in both English and mathematics in the 15 school systems of Southern and Eastern Africa. Secondly, working as educator and culture mediator in the schools, I felt the need of deepening my knowledge in education research by studying two different school systems.

The first chapter outlines how the Kenyan and Italian school systems are structured at present. The Kenyan system is referred to as 8-4-4, which means 8 years of primary education, 4 years of secondary education and 4 years of tertiary education. The Italian system comprises of 5 years primary education, 8 years of secondary education (3 years lower secondary education and 5 years of higher secondary education), and 5 years of tertiary education.

In the second chapter the historical development of the Kenyan and Italian middle school is explained. In Kenya the middle school has evolved a lot since independence depending on the President at a given period. Education in Kenya has always been given a lot of weight so the parents and the government invest a lot for its success. On the other hand the middle school in Italy has undergone changes depending on the Minister of Education at a certain period of time. As compared to Kenya, education has never been given much weight in Italy and as result the investment is limited.

The third chapter is a literature review on how education quality is evaluated at a local and international level. The evaluation is usually based on reading, mathematics and science scores. The data is collected and analysed using the multi level and multi variant methods. In recent years evaluating the quality of education has become of prime importance in order to understand how effective and efficient a school system is. The popular evaluating organizations are SACMEQ, INVALSI, OECD , PISA, and TIMSS.

The fourth and fifth chapters are descriptions of how data was collected, analysed, and the results of a qualitative and quantitative research carried out to find the factors that influence the quality of education in the sixth year of compulsory education.

1. A GENERAL DESCRIPTION OF THE PRESENT KENYAN AND ITALIAN EDUCATION SYSTEM

1.1. Structure of Kenyan System of Education

In 1981, a Presidential Working Party was commissioned to examine curriculum reform of the entire education system in the country. The committee submitted a recommendation to change the 7-4-2-3 education system to the current 8-4-4 system of education, whose overall structure was similar to the U.S. education system. The 8-4-4 system was launched in January 1985, and was designed to provide eight years of primary education, four years of secondary, and four years of university education. Emphasis was placed on Mathematics, English, and vocational subjects. The focus on vocational education was aimed at preparing students who would not continue on with secondary education, those who would be self-employed, and those who would be seeking employment in the non-formal sector (Ministry of Education).

1.1.1. Pre-primary education

Prior to joining primary school, children between the ages of three and six are required to attend pre-primary (pre-unit) for one or two years. The main objective of pre-primary education is to cater for the total development of a child, including the physical, spiritual, social and mental growth, brought about through formal and informal interaction with the parents and the community taking a leading role. A focus of pre-primary education has been health, nutrition, care, and basic education. Programs are run through partnership with the government, district-based agencies, local communities and external agencies. The Pre-School section of the ministry of Education is responsible for the registration of pre-schools and the coordination of all partners.

1.1.2. Primary education

Primary school is the first phase of the 8-4-4 education system and serves students between the ages of 6-14 years. The main purpose of primary education is to prepare students to participate in the social, political and economic well being of the country, and prepare them to be global citizens (Education Info Centre, 2006). The new primary school curriculum has therefore been designed to provide a more functional and practical education to cater to the needs of children who

complete their education at the primary school level and also for those who wish to continue with secondary education. In addition it caters to students who wish, and have the means, to continue on with secondary school education. Primary education is universal, free and compulsory. A major goal of primary education is to develop self-expression, self-discipline, and self-reliance, while at the same time providing a rounded educational experience.

At the end of the eighth year, the Kenya Certificate of Primary Examination (K.C.P.E.) is taken and the results are used to determine placement at secondary school on a merit basis. K.C.P.E. candidates are examined in five subjects: Kiswahili, English, Mathematics, Science - Agriculture and Social studies, (Education Info Centre, 2006; Ministry of Education, 2008).

When a new government was formed in 2003, one of the priorities was to re-avail educational opportunities in order to meet Universal Primary Education (UPE), the second of the eight Millenium Development Goals (MDGs). Figures for instance show that massive school dropouts were recorded and that out of about one million students who enrolled in standard one in 1993 and in 1998, less than half a million got to standard eight (Oketch and Rolleston, 2007; Onyango, 2003).

Free primary education (FPE) was, therefore, introduced. This resulted in a significant increase in enrolment from 5.9 to 7.2 million pupils. However, most schools were not equipped to handle the large numbers of students in terms of the number of teachers, physical classroom space and learning resources (Mukudi, 2004). In some schools, some classes now have as many as 80-100 students. Ironically, the introduction of free primary education has led to a dramatic increase in the number of privately owned and operated schools. These schools target families who can afford to pay school fees and have their children taught in small groups.

1.1.3. Secondary education

Secondary school education begins around the age of fourteen. However due to delayed primary school entry and limited educational schools and facilities, many students especially those from rural areas experience late admission into the education system years. Secondary school education in Kenya is aimed at meeting the needs of the students who terminate their education after secondary school and also those who proceed onto tertiary education (Education Info Centre, 2006). It takes 4 years to go through secondary school. At the end of the fourth year in secondary school, the Kenya Certificate of Secondary Examination (K.C.S.E.) is taken in the mandatory and elective subjects in preparation for tertiary and higher education.

1.1.4. Tertiary education

For students who go on to higher education in Kenya, there are seven public universities and 17 private universities with either full or interim charter. In addition to adding technical courses at the primary and secondary school level, vocational education has been a focus of the education system. The Ministry of Higher Education has developed a national strategy for technical and vocational education and training aimed at the rehabilitation of physical facilities and equipment and ensuring that vocational and technical institutions are appropriately equipped by 2010 (UNESCO, 2006) and there many colleges which offer certificate diploma programs. These public and private colleges offer technical skills in various fields including, engineering, medical sciences, nursing, education, computer science, mass communication, tourism, and business.

1.2. Education system in Italy

Education in Italy is compulsory from 6 up to 16 years of age. It covers the first cycle (8 years) and the first two years of the second cycle (upper secondary education). The first cycle includes *scuola primaria* (primary school, 5 years) and *scuola secondaria di primo grado* (lower secondary school, 3 years). The second cycle of education is made up of the *scuola secondaria di secondo grado* (upper secondary school, 5 years) falling under the responsibility of the State and offered by the *licei* (academic oriented course of study), the technical institutes and the vocational institutes, and of the vocational and training system falling under the responsibility of the Regions and offered by the recognized formative agencies operating nationwide.

1.2.1. Pre-primary education

Pre-primary education is organized at *scuola dell'infanzia*, it lasts 3 years and it is addressed to children from 3 to 6 years of age. The pre-primary level is part of the education and training system, yet it is not compulsory. Pre-primary education is organized on three different institutional levels: institutions established and run by the State, by local authorities and by private organizations (mainly religious). It contributes to the affective, psychomotor, cognitive, moral, religious and social development of children and promotes their potentiality of establishing relationships, of autonomy, creativity, learning and to secure equal educational opportunities: in the respect of the educational responsibility of parents, it contributes to the integral education of children; through its autonomy and didactical and pedagogical unity, it carries out the educational profile and the

educational continuity together with all childhood's services and the primary school' (Legislative Decree 59/2004, art. 1).

1.2.2. Primary school education

Primary school is compulsory, has an overall length of 5 years and is attended by pupils aged from 6 to 11 years, together with compulsory lower secondary school, it makes up the first cycle of education which lasts for eight years. Primary school and lower secondary school are two different education levels, each with its own specificities, even though they are parts of only one school cycle. It is possible to institute comprehensive institutes that include primary schools, lower secondary schools and also pre-primary schools, managed by only one school director.

Primary school, through the exploitation of the pupils' personal diversities, including those with disabilities, fosters the personality development, the acquisition of basic knowledge and the development of skills, from ICT literacy up to the first logical-critical organisation, as well as Italian language and English language literacy; use of scientific methods in the study of the natural world, its phenomena and laws, and to exploit social and orientation skills in the space and time as well as to teach the fundamental principles of civil coexistence (Legislative Decree no. 59 of 19 February 2004).

Primary school education aims are clarified in the National Guidelines for the personalised study plans of 2004 and in the new Guidelines for the curriculum introduced on a trial basis for school years 2007/08 and 2008/09.

1.2.3. Secondary and post-secondary non-tertiary education

The lower secondary school is compulsory, has an overall length of 3 years and is attended by pupils aged from 11 to 14 years. The second cycle of education is made up of the upper secondary school falling under the responsibility of the State, and the vocational and training system falling under the responsibility of the Regions. The first two years of the second cycle of education are compulsory.

The State upper secondary education is offered by the *licei*, the technical and the vocational institutes. The overall length of study is 5 years (from 14 to 19 years of age) both in the *licei* and in the technical institutes, except for the *liceo* specialising in arts subjects which offers a course of study of 4 years plus an additional year. Vocational institutes offer 3-year courses that can be followed by further 2-year courses.

Initial Vocational Training (FPI), is offered by the recognised formative agencies operating nationwide. The FPI provides for: basic vocational education and training pathways and is addressed to those who have completed the first cycle of education. These paths have a three-year length and lead to the obtainment of a regional qualification certificate; second-level training pathways addressed to those who have completed the upper secondary level of education or who have obtained a basic vocational qualification; finally, at post-secondary level, within the higher technical education and training system, two different training pathways are available, those offered by the Higher Technical Institutes (ITS) and those offered by the Higher Technical Education and Training (IFTS).

1.2.4. Tertiary education

Higher education aims at promoting science progress and supplying the necessary scientific culture for the professional practice. The higher education sector in Italy underwent a reform process to align itself with the European model in the Sorbonne (1998), Bologna (1999), Prague (2001), Berlin (2003) and Bergen (2005) agreements. According to the European prospect, the reform of the Italian higher education system is subdivided into three separate sectors: university tertiary education; non-university tertiary education offered by the Higher level Arts and Music Education (Afam), higher technical education and training, and non tertiary education offered by higher institutions.

2. THE HISTORICAL DEVELOPMENTS OF THE KENYAN AND ITALIAN MIDDLE SCHOOL

2.1. Kenyan middle school

This section examines the role of the Kenyan state in regards to the historical development and expansion of the educational system and the current educational challenges facing the country. Like other post-colonial states, the “fragile” Kenyan state has been severely constrained in its efforts to build a modern and meritocratic educational system. In tracing the government’s educational activities and policies from independence to the present, it becomes clear that the state’s early inability to control demand for education is largely responsible for two contemporary problems: the extremely competitive nature of the educational system, and the serious imbalance between education and the labour market.

The case of Kenya demonstrates the challenges facing fragile states in regards to education. Since independence, Kenyans have expressed great faith in education. The Kenyan state promoted education as the key to social and economic development, while individuals looked to formal schooling as the means to social mobility and improved quality of life. This faith in education enforced the rapid expansion of the educational system at all levels. At independence in 1963, fewer than 900,000 Kenyan children attended primary school. By 1992, this figure reached 5.53 million, reflecting a primary enrolment rate of 96 percent (Republic of Kenya 1993). The expansion of enrolments in secondary and higher education has also been striking. But now, over three decades after independence, there are clear signs that Kenyans’ faith in education is faltering. The escalating costs of schooling, declining quality of education, and growing unemployment among the educated have become issues too serious for most people to ignore.

Numerous historical developments demonstrate that, while the state successfully initiated educational expansion through Harambee¹, educational demand quickly grew beyond the state’s capacity to control it. In an analysis of the state and school demand in Kenya, Bradshaw and Fuller (1996) maintain that the rapid expansion of education in the post-independence period was evidence of the state’s initial strength. In their view, beginning in the early 1980s the state grew fragile and its control over educational expansion began to falter.

¹ Harambee is a kiswahili word meaning “let us pull together”.

2.1.1. Post-Independence Educational Expansion: The Kenyatta Era, 1963 to 1978

During the colonial period, educational opportunities for Africans remained very limited. Thus it is not surprising that, when Kenya gained independence in 1963, the new government quickly set out to expand educational opportunities to all Kenyans. The denial of academic education to most Africans during the colonial period had ignited a demand among Kenyans for schooling that was not to die down quickly. Moreover, the new government faced a great and immediate need for trained leaders and skilled workers to fill the posts previously held by the Britons. Both of these factors required the rapid expansion of education. In his inaugural address in 1963, Kenya's first President, Mzee Jomo Kenyatta, promised free primary education to all citizens. This promise was only partially realized over a decade later when, in 1974, the government abolished fees for the first four years of primary school. Nonetheless, primary education expanded rapidly, and the country attained a primary enrolment rate of nearly 80 percent within the first decade after independence (Eshiwani 1993).

Also with independence, President Kenyatta introduced the call for Harambee, Swahili for "let us all pull together." This call was meant to initiate development projects in all sectors of society, but "for the majority of Kenyans the burning issue was more schooling opportunities for their children" (Mwiria 1990:352). Kenyans embraced the concept of Harambee schools where local communities raised funds and built secondary schools rapidly. A system of government that supplied primary schools had been in place since the colonial period, but the government had provided very few secondary schools. As a result, most Harambee efforts were focused on building and equipping secondary schools. By 1974, one decade after independence, there were over six hundred Harambee secondary schools and the total capacity of secondary schools had grown to nearly ten times its original size (Eshiwani 1993).

Certainly, the Harambee initiative served numerous purposes for the Kenyatta government. Harambee secondary schools greatly supplemented the government's provision of schools and offered educational opportunities to children who would otherwise not have attended school beyond the primary level. The emphasis on community-level initiatives to expand education also deflected attention from the state's own limited resources and helped foster a sense of national unity among Kenyans. Remarkably, within the short period of five years the rapid expansion of secondary education produced enough skilled graduates to fill most of the work force needs of the new government. At the same time the demand for secondary education seemed nearly insatiable (Keller 1977). But the fact that the rapid expansion of secondary schooling occurred largely beyond the

government's purview and primarily through reliance on community self-help also brought problems.

First, Harambee schools were generally expensive but lacking in quality. Numerous studies documented inferior conditions in Harambee schools as compared to government schools in terms of class size, teacher training, and educational facilities (Thomas 1985; Hazlewood et al. 1989). Kenyans were well aware of the discrepancies between government and Harambee schools. The ultimate goal of most students was to score high enough on the primary school exam to gain access to a government secondary school. Nonetheless, for the thousands of children who were not accepted to government schools, Harambee schools offered the only alternative. The low quality of most Harambee schools was also reflected in the poor exam scores of Harambee school students and their low rates of advancement to post-secondary schooling in comparison to students from government schools (Kinyanjui 1981). Since the majority of Harambee schools received no government support and others received only minimal aid from the government, they were also more expensive to attend than government schools. As a result, compared to students in government schools, Harambee school students were paying a great deal more money for a vastly inferior education.

Second, the decentralized nature of educational developments through Harambee led to large regional disparities in the number and quality of Harambee schools. While the concept of Harambee successfully evoked the sense of a massive effort for the benefit of all, in reality the frequency and success of their self-help initiatives varied widely by community and region (Zamberia 1996). Communities in Central, Western, and Nyanza Provinces, in which the independent school movement had been well established, flourished under the Harambee system. Other peripheral regions in the Coast, North Eastern, and Rift Valley Provinces, which had little experience with self-help schooling, struggled to catch up. Wealthy communities and ethnic groups were able to build more and higher quality schools than their poorer counterparts. The government's practice of rewarding additional funds to prosperous and well-organized self-help efforts only exacerbated these disparities.

There is evidence that the government recognized these possible problems not long after independence but was unable to alter the course of Harambee school expansion. At an official opening of a Harambee school in 1964, President Kenyatta warned that school expansion could spiral out of control: *"The people of this country must accept the guidance and advice given by officials of the Ministry of Education. Unless this is done, then the country's education might be in jeopardy. I would like to stress at this point the need for planning and control of our educational expansion. The vast majority of our people are working constantly to ensure an education for their*

children. This is good, but if these children go to bad schools, without adequate facilities and without good teachers, the kind of education they receive may not help much after in life” (cited in Mwiria 1990:353, emphasis added).

In the years that followed, the government tried to regain control over the expansion of the educational system. The Ministry of Education declared it illegal to build a school without its permission. The government also passed a law that required communities to raise at least 40,000 Kenyan shillings (at that time, an exorbitant sum) before beginning construction of a school (Republic of Kenya 1965). These laws were unpopular and generally ignored. The government did not have the organizational strength to enforce its own regulations and communities continued to build schools. Writing about educational policy during the first decade of independence, Keller notes, *“While it has been possible for government officials and politicians to activate community self-help movements, they seldom have been able to control them, especially where Harambee schools are concerned. The tradition of community independence is much too strong for that”* (1977:91). Government reports continued to cite rapid secondary school expansion and the questionable contribution of this expansion to the long term development of the nation as key issues of concern. Increased unemployment among secondary school graduates was a clear sign that the educational system had grown beyond the means of the economy to support it.

In a 1976 policy document, the government warned of the possible *“vicious accumulation of social frustration which might cost the country more heavily to correct at a later date”* (Mwiria 1990:355). But it became increasingly apparent that the state was unable to control the expansion of secondary schooling. Rather than heed its own warnings and enact policies to bring the educational system in line with long term economic goals, the government took the politically popular route. It continually supported educational expansion and formulated initiatives that signalled even greater educational opportunity.

The 1970–1974 Development Plan outlined government aid to Harambee schools. According to this plan, the government would support 50 Harambee schools each year, with trained teachers, educational materials, and help from the inspectorate. The government continued to provide Harambee schools with teachers and to pay their salaries as it had done in previous years, but it fell far short of its promise to provide other forms of aid to 50 Harambee schools annually. In actuality, only 25–30 Harambee schools received additional equipment and facilities from the government during this period. The 1974–78 Development Plan again emphasized the need to control secondary school expansion and reduce government spending on education, which by 1974 had reached 34.5 percent of recurrent expenditure (Republic of Kenya 1988). But the growth of secondary schooling continued unchecked.

Between 1974 and 1978, secondary school enrolments nearly doubled (from 179,867 to 349,711) and the proportion of enrolled children who attended Harambee schools as opposed to government schools increased from 48 to 67 percent (Mwiria 1990). In sum, the Kenyatta era was characterized by the uncontrolled expansion of formal education at all levels. The government supported expansion despite an understanding of the long-term economic and social costs of this stance because it was too weak to do otherwise. Rather than coordinating the growth of schooling to match the needs of the nation, the fragile Kenyan state was forced to react to the educational developments initiated by local communities. At the same time, by supporting Harambee initiatives and adopting policies that aided school expansion, the state enhanced its own legitimacy (Bradshaw 1993). It demonstrated a commitment to providing educational opportunities to all children. This stance, coupled with the national examination system, promoted the idea that the Kenyan educational system was meritocratic. It also relieved the government from sole responsibility for the supply of educational facilities, since most of the burden of financing secondary education was left to communities and parents.

Finally, the government's strategy of supporting community self-help efforts yielded political dividends for individual government officials. Politicians, church leaders, businessmen, and bureaucrats all played a prominent role in the Harambee process. Through their patronage and participation in Harambee *barazas* (fundraising meetings), politicians gained local and national visibility (Keller 1977). Thus by advocating and supporting the local initiatives of civil society to expand schooling, the Kenyatta government was able to promote its own (short term) legitimacy and assume the role of a modern and compassionate state.

2.1.2. From Harambee to Nyayo: The Moi Era, 1978 to 2003

Under the new leadership of Daniel Arap Moi, who became President in 1978, educational expansion continued much as before. The new government's philosophy, Nyayo (literally "footsteps"), sent a strong signal of President Moi's intention to follow the lead established by the previous regime. Much like his predecessor, Moi enacted educational policies that were politically popular but of questionable value for long-term national development. As Cooksey, Court, and Makau (1994:207) explain: In the 1980s the making of educational policy by political fiat increased, as demonstrated by: the introduction of the primary school milk scheme (1979); the introduction of the 8-4-4 system (1983); and, the decision to more than double university intake (1987-1990). The milk scheme provided free milk to all primary schools, while the 8-4-4 initiative restructured the British-style 7-4-2-3 system into a more open American-based 8-4-4 system.

This change eliminated the selective Cambridge exam that had been required of all students midway through their secondary education. These policies signalled greater educational opportunities for all Kenyan children and, not surprisingly, led to immediate enrolment increases at both the primary and secondary levels. Harambee as a grass roots movement was altered to take on a more political tone. While politicians had always been involved in Harambee fundraising, *barazas* increasingly became events during which politicians campaigned for votes. Villagers complained that their contributions were being used to advance the careers of politicians and local officials rather than for the purpose of community development. The politicization of Harambee undermined the legitimacy of Moi's government and the frequency of Harambee initiatives declined throughout the country (Barkan and Chege 1989).

The promotion of "education for self-reliance" consisted of a new curriculum that included more practical and vocational subjects as a means to "instill realistic attitudes and aspirations regarding employment in both parents and school leavers" (Republic of Kenya 1989:212). This revised curriculum was meant to prepare students for self employment in agriculture or the informal sector, instead of higher education and a government job. "Education for self-reliance" was the first Moi-era policy formulated with an eye toward long term development concerns as opposed to short term political gains. But, after decades of promoting education as the key to social mobility, this attempt to match the educational system to actual employment prospects was far too ambitious to be successful (Court and Kinyanjui 1985). Instead, the expansion of the curriculum to include vocational subjects exacerbated the high costs of schooling (as schools had to hire new teachers and build and equip workshops), exam hysteria, and pressure on students to succeed across a wider range of subjects in order to compete for higher education and formal sector employment. The economic decline of the 1980s also left the Kenyan government with a massive debt (over \$6.8 billion in 1990) and a severe shortage of resources (Ndulu and Mwegu 1994).

Foreign aid became tied more closely to structural adjustment policies that required severely scaled-down government spending. Since the state could no longer afford to subsidize the cost of secondary schooling for students enrolled in government schools, it had little choice but to abdicate much of its control over government schools to local communities. This led to the erosion of quality and meritocracy in the one sector of education that had performed reasonably well in both, regarding government secondary schools.

The Ministry of Education called for greater "cost sharing" by parents and communities to maintain these schools (Odada and Odhiambo 1989). It also gave more power to the parent teacher associations and school administrators to charge and collect school fees. Government schools, which had previously charged only nominal fees for enrolment, became more like Harambee

schools in their fee structure. As a result “the better schools became the exclusive province of parents who could afford to pay the high fees. “Parents who could not afford to pay the fees in these schools were forced to seek places in lower-quality institutions” (Cooksey et al.1994:212). Moreover, in the search for additional revenue, government schools began admitting small groups or “streams” of Harambee students. Students that had not scored well on the primary school exam were allowed to join government schools by paying higher fees than students who had been admitted on the basis of their exam scores. The quality of government schools declined rapidly as streams of Harambee students joined government schools but staff and facilities were not expanded to match the additional intake.

Most recently, as the distinctions between Harambee and government schools have become more ambiguous both in terms of cost and quality, the government has announced a new method of ranking schools into five categories: national; provincial; district; high-cost private, and low cost private schools (Daily Nation May 26, 1995). Clearly, these developments indicate that the Kenyan state has continued to be weak and largely ineffective in developing educational policies that are conducive to long-term social and economic development. As Bradshaw and Fuller note “Moi’s regime remains very active in the education sector but much of this policy activity serves to maintain minimal levels of legitimacy and broaden Moi’s political interdependencies”. In short, the state can appear to be strong, active, even corporate-authoritarian in character but still hold little effect on the local economic practices, social commitments, and institutional demands exercised by families (1996:90).

2.1.3. Kibaki era from 2003 to 2013

The contemporary educational system is a direct result of civil society’s early involvement in school expansion and the state’s conciliatory response to this expansion. As the above discussion makes clear, the fragile Kenyan state has repeatedly responded to popular pressures by promoting policies that signal mass educational opportunity. It has little capacity to alleviate disparities in educational opportunities or shape the educational system to suit the long-term needs of the nation. One consequence of the state’s weakness in this regard is the escalating competition for secondary and higher education. Frequent grade repetition and the growth of shadow education (informal educational activities designed to improve student’s exam scores) are two results of this intense competition for educational credentials. Both result in an immense expenditure of severely limited resources on behalf of the nation and Kenyan families. Another consequence is the growth of an

educated populace that extends far beyond the actual employment prospects in the nation. This issue is especially serious as it appears to have led to flagging educational demand nationwide.

2.2. The historical development of the Italian middle level school

In 1861 when the Italian kingdom was established, three out of four Italians were illiterate, with peaks in Sardinia, Sicily and Calabria, where illiteracy was around 90%, but even the most literate regions, such as Piedmont and Lombardy, were around 60%. The fight against illiteracy was long and difficult, at the end of the century "the vital registration system", based on the condition of those who applied for a marriage certificate, showed that out of 100 couples 50% of Modena, 52% in Parma, 55% in Siena, 63% in Sassari and 70% in Messina were still illiterate.

The Italian education system, in particular the secondary education, is still structured according to what was established by the Minister Gentile reform of 1923, except for some amendments introduced during Fascism. In 1939, Minister Bottai had the *carta della scuola* approved by the National council of Fascism, this document outlined a new reform which was never carried out due to the outbreak of the second world war.

2.2.1. Post II World War era

A new era started after the war, introducing democratic concepts which aimed at guaranteeing equal school access to all the students. Section 34 of the Italian Constitution states that, "lower education is compulsory, free of charge and lasts for eight years. Able and deserving pupils, even though without means, have the right to achieve the highest levels of education".

In 1962, the unified and compulsory *scuola media* was instituted, with a duration of three years and replaced the pre-existing model of the former "scuola media Bottai" which gave access to upper secondary schools.

The changes introduced by the law (1859, 31/12/1962) were:

- the middle school was a *scuola unica*, which put to an end the distinction between premature entry to work and a preparation to the upper secondary education;
- ratified compulsory and free education up to 14 years; was characterized by training and orientation;
- changed the idea of pre-adolescent, stressing the need to take into account "non-academic" skills,

- finally emphasized its social character (environmental openness and enhancement of parents' participation).

Further amendments were introduced with the Law of 16 June 1977, no. 348. The first national programmes for the unified middle school commenced in 1963, further programmes were subsequently introduced in 1979 within a framework of school policies aimed at guaranteeing the formative success foreseen by section 3 of the Italian Constitution. In order to assure the right to education for all, schools were required to offer a personalised teaching, adapted to the different learning approaches of everybody and to reduce the conditioning factor of the social-economic and cultural environment.

The middle school was only activated in the school year 1963/64 and the programs for the previous system ended in June 1965. The new school was faced with many obstacles, such as: lack of preparation for teachers; structures in poor conditions; deficiencies (especially in the South), and limited educational facilities.

2.2.2. Recent changes

Law 348 of June 1977 brought some changes in the middle school program towards the direction of a renewed interest in efficiency and as a result weakened the academic disciplines. The Law 517/77 also took a similar direction regarding the evaluation, in particular the mechanism of the tests which were considered inadequate systems for measuring intellectual development of the students. The remedial examinations were abolished and a single exam was established at the end of the eighth year, *after-school* activities were regulated, full-time introduced, and disabled students were integrated. These innovations were introduced without evaluating the project outcomes. In accordance with the Decree Lgs. 112/1998 on the *L'autonomia scolastica*, schools can now independently start new formative courses through agreements with the regions

Following the Minister Moratti reform, the middle school (now known as the lower secondary school) lost its secondary characteristics and it's now considered as a final phase of the basic education with a uniform and non sequential structure. The diffusion of the European tests of learning (PISA) results positioned the schools at a low level and demonstrated the difference between North and South, this was an indication that some action needed to be taken.

When Minister Mariastella Gelmini, took office in May 2008, she recovered most of the law 53 but on the other hand retained the elements introduced by Minister Fioroni (greater severity, anti-bullying, return to centralism) and had to deal with the tight budget caused by the economic crisis. The Ministers of Education lack popularity despite their political parties of affinity

and are often attacked by teachers and students. It is a common idea that spending in schools is not only limited, but badly managed. In the ten years (1980/1990) school spending per capita increased from 2,039,000 to 3,696,000 lire (+81.2%), due to the reduction of the ratio between teachers and pupils which decreased from 10.5 to 8.4.

Indeed, the first international surveys indicated a weakness in the Italian secondary school students, especially in science, and put further emphasis on territorial imbalances. These considerations outline the importance of evaluating and monitoring the quality of education which in the recent years has witnessed the involvement of many international organizations like OECD, INES, CEDE. Although the conceptual framework is already clear and states that it is necessary to initiate a complex process involving both qualitative and quantitative aspects, the evaluating culture is still not fully implemented.

3. LITERATURE REVIEW ON THE EVALUATION OF EDUCATION QUALITY

In many countries, both in Europe and elsewhere, it is customary to publish a summary framework outlining the state of the education system for the purpose of bringing to light information on the most important aspects of this system and making this information accessible to the public, assembling material from different sources and at the same time providing clear and specific reading pathways. Different countries use different ways of assessing the quality of their school systems, be they methodological and conceptual (theoretical frames of reference, indicators), or technical and practical (type and frequency of publication, issues discussed).

The aspects or indicators identified by each country in its own context permit both spatial and temporal comparisons. Comparisons over time show how different education systems have developed and changed and reveal any effects of reforms or other administrative measures. Territorial comparisons expose differences and similarities among the education systems of different countries and at the same time facilitate an analysis of the ‘distribution’ of the educational possibilities within each country at all levels (national, local, single school, individual student).

The goals of Lisbon regarding education are an example of a joint temporal and spatial analysis. In 2004 the Ministers of Education of the European Union countries adopted a set of common objectives for the improvement of their education and training systems and a work program for achieving them, known as *Education and Training 2010* (Council of the European Union, 2004). A constantly updated series of indicators and benchmarks was developed for monitoring the progress of each country toward the common objectives established.

Another example is “The Southern and Eastern Africa Consortium for Monitoring Educational Quality” (SACMEQ) which is an international non-profit developmental organization comprising of 15 Ministries of Education in Southern and Eastern Africa that work together to share experiences and expertise in developing the capacities of education planners to apply scientific methods to monitor and evaluate the conditions of schooling and the quality of education, with technical assistance from UNESCO International Institute for Educational Planning (IIEP). The 15 Ministries of Education that constitute the SACMEQ network are Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania (Mainland), Tanzania (Zanzibar), Uganda, Zambia and Zimbabwe. SACMEQ has completed two major education policy research (SACMEQ I and II) Projects between 1995 and 2005. The third (SACMEQ III) Project that commenced in 2007 was completed in 2011 and the fourth (SACMEQ IV) commenced in 2012.

Assessing the quality of school systems using indicators addresses the goals of making summary information about the most important aspects of the education system transparent and accessible to the public, while at the same time providing policy makers with objective evidence for evaluating the health of their country's system of education and training.

3.1. Assessing the quality of education systems using “systems of indicators”

The utilization of systems of indicators is today internationally regarded as the main tool for collecting objective information for the evaluation of school systems. These tools allow comparisons in time and space, making it possible to monitor changes in single phenomena observed over time and in specific contexts (different education systems, different geographical areas, different scholastic institutions, etc.).

In the field of education research, an indicator may be considered as a means of supplying information on the state of an educational system, a device that indicates whether it is working correctly or not (analogous to what happens on the dashboard of a car, where the various instruments allow the driver to check that everything is working properly). The indicator does not in itself say anything about the cause of a particular problem or point to a solution; it simply serves as a symptom that draws attention to one or more aspects of the education system's condition of health (Castoldi: 1996). The definitions of indicators focusing on the education system, must be integrated with the perspective of the individual school in a context of school-based management, that is, of decentralization of the educational decision-making process through the involvement in the schools of both the parents and the community (International Bank for Reconstruction and Development, 2008). The metaphor of the dashboard of a car has often been utilized and often referred to in scholastic language. From a strategic point of view the use of indicators reinforces the “logic of the dashboard”, creating conditions in which the school can keep the efficiency and effectiveness of the curriculum under control (Romei: 1999).

The indicators used by different countries are reducible to three main typologies:

- in some cases countries simply supply information that doesn't form a basis for any particular judgment: number of scholastic units, number of students, etc. Information like this is used to design a service, not to evaluate it;
- in other cases, indicators are tapped to study certain aspects more thoroughly (such as incoming or ongoing training of teachers), i.e., they have a descriptive value;

- other indicators are instead linked to variables which are assigned a value or quality criterion, positive if the variable seems to promote learning and negative if it seems to represent an impediment (for example teachers' transfer requests). In some cases it is enough to know if such a criterion exists or not (whether a laboratory is used for educational purposes, for example), but in most cases this is not enough, it will be important to know the degree to which a criterion exists and, above all, to what extent this is considered acceptable.

Indicators are closely connected to the concept of standards. It is not enough to know how high or low a value is for a certain indicator, but it is also important how close such a value is to the standard established as reasonable in the situation.

Standards can be:

- requirements such as those set by the authorities in each country (e.g., the minimum number of students per class);
- benchmark standards, whose actual level is set against what is considered to be their theoretical level (e.g., grouping together schools of the same type, or students in the same socio-economic range);
- standards concerning objectives levels of excellence that can be set as goals.

3.1.1. System of indicators

Considering the complexity of the situation under analysis, that is, the educational system, it is usually insufficient to rely on a single indicator; it becomes necessary to put together a series of indicators, each of which is capable of focusing on one part of the system. Indicators are not simply juxtaposed measurements; they make up a coherent structure, a 'system' of data that can present a valid picture of a system of education. This is the sense in which the expression 'system of indicators' is preferable to 'single indicator'.

The continuing evolution of systems of indicators reflects the need to arrive at a list that is as sensitive as possible to the assessment requirements of different education systems. This process often coincides with a gradual decrease in the number of indicators themselves. The experience of many European and non-European countries², along with that of the INES (*International*

² For example, a report has been published in France since 1991 in which the education system is described using indicators; in Spain a similar report has appeared since 2000; in New Zealand since 2006, while in England the quality of the education system and the schools has been under examination for almost a century.

Educational Indicators) project dating back to 1987³ shows that even after decades of experimentation, publications concerning the quality of the education system and the schools are still reworked and updated, implying a serious commitment to the continuous revision of conceptual frameworks and related structures for gathering information.

Over the years there has been increased attention to educational results and the processes believed to be linked to them, and this has therefore been extended to the indicators required to measure them. The need for a comparison of various countries' approaches to the observation of their own school systems has grown as well. The use of a theoretical frame of reference or framework underpins the structure and selection of the 'system of indicators' inasmuch as it offers a justification of the choices made – an explanation, that is, of the connections between the features described by the indicators and the procedures and techniques of data collection.

A system of indicators is not, or not completely, able to give definite answers regarding the direction and strength of the relationships between different aspects, but it offers the opportunity to explore these relationships and work out a complete picture of the effects and possible causes. As Fitz-Gibbon and Tymms (2002) put it, "An indicator system is only a step along the way to trying to understand what works, and how schooling can be improved. Consequently, some of our indicator systems include process variables such as descriptions of methods of teaching and learning [...]. Process indicators serve to generate hypotheses and most importantly, they stimulate discussion of teaching methods among staff in schools and as such are valuable. The important problems in trying to attribute cause and effect must, however, be continuously emphasised". Amongst the variety of the indicators analyzed in the several countries considered, three main key points were focused.

The first point is that in most of the more developed education systems the frameworks adopted are structured matching a system perspective with a school perspective, often integrating quantitative and qualitative techniques to collect data.

The second point is related to the evaluation's objectives, which are findable on a continuum having his poles in the two different concepts of 'develop' and 'control': the 'develop' approach focuses on the role that evaluation can play in changing the education system, in a perspective of operators' involvement and constituting a real organizational learning; while the 'control' approach refers to the bureaucratic controls, that is the conformity with procedures and laws.

³ The INES Project is the most important international initiative involving the construction of a set of indicators capable of comparing the development of different school systems and assessing their effectiveness and qualitative depth. The project was developed in the annual publication *Education at a Glance*.

The third point deals with the definitions of the aspects investigated. While there's a wide convergence about dimensions and areas of research, more difficulties are to be faced up regarding the definition of those elements (indicators, aspects, variables, etc.) considered able to describe those dimensions/areas. The most common strategy to avoid this obstacle is to publish the conceptual frameworks, in order to make clear aspects to be investigated and procedures chosen for measuring school characteristics.

3.2. Effectiveness and Efficiency of Educational Measures

In recent years, evaluating the performance of educational organizations has sparked increasing interest and debate. Many expectations ride on the smooth operation of school systems. It is widely believed that countries' social and economic well-being will depend to an ever greater extent on the quality of their citizens' education: the emergence of the so-called "knowledge society", the transformation of information and the media, and increasing specialization on the part of organizations all call for high skill profiles and levels of knowledge. Today's education systems are required to be both effective and efficient, or in other words, to reach the goals set for them while making the best use of available resources.

For some time now, several of the major national and inter-national organizations that support education and economic development (UNESCO and the OECD, for example) have published an extensive set of indicators that describe the main characteristics of how education systems work in a number of countries: student flows and levels of educational attainment, schools and their environment and the costs of education. Information about educational institutions can be provided by a variety of sources; it can be intended for administrative use or made public; it can concern different levels: the system, the school, the class. In all cases, however, its aims are the same: to increase the knowledge and understanding of educational institutions and support evaluation processes. Evaluating education policies means expressing a judgment based on a controlled process of investigation regarding the relevance, the advisability and effects of the action that has been taken. The CIPP (*Context, Input, Process, Product*) model proposed by Stufflebeam (1968) over forty years ago provides a solid analytical basis for evaluating education policies. By considering the economic and socio-cultural setting in which the school operates and to which it must adapt its educational provision (Context), the human, technological and financial resources that are available, as well as the applicable laws and regulations (Input), the activities (Process) and the results (Product), this model provides an accurate description of school systems. The success of the CIPP model firmly established evaluation practices based on massive collections of data. In two successive conferences (Washington D.C. in 1987, and Poitiers in 1988), the US Department of

Education and the OECD Secretariat emphasized the need for high quality indicators for all significant aspects of education systems (OECD 1994). To arrive at a useful representation of education systems, it is first of all essential that these indicators represent all of the dimensions involved semantically. Second, they must be logically and empirically related, in order to provide a consistent data set.

It cannot be ignored that limiting evaluation to examining and comparing the main descriptors of education systems, what Pawson and Tilley (1997) call “quantitative meta-analysis”, creates distortions, chiefly because of the failure to identify causal links, the excessive simplification of outcomes (dichotomized as either success or failure), and the insufficient consideration given to differences in context. Indicator-based evaluation, though requiring analysis and further investigation to identify the mechanisms activated together with various application situations, for example, as well as the results achieved on the whole now ranks among the most highly accredited analysis procedures and has thus been adopted by the major national and international educational research agencies. The usefulness of indicators is proportionate to their ability to describe the central and lasting characteristics of school systems and to furnish information about real or potential problems, with a view to formulating targeted policies or measures.

Evaluation addresses two distinct factors: effectiveness and efficiency. The first concerns the school system’s ability to achieve its institutional goals: teaching general and abstract knowledge, as is needed to master languages, symbols, images and concepts, and transmitting cognitive methods and thought patterns. The second factor concerns the ability to achieve assigned aims by making the best use of all allocated resources. Effectiveness indicators refer both to the outputs of education systems in terms of observable products for instance, the number of graduates in a given school year and to the outcomes achieved, i.e., the degree to which goals are reached, as demonstrated, for example, by students’ scores on tests of their skills and knowledge in curriculum subjects. Efficiency indicators, on the other hand, are economic in nature: public expenditure, private expenditure, total expenditure, expenditure per student, cumulative unit expenditure by level of education, current and capital expenditure, and public spending on education in relation to GDP and to total public spending.

There is no clear-cut dichotomy between effectiveness and efficiency: there are infinite gradations in achieving education’s goals, just as there are infinite gradations in the economical management of capital, be it monetary or otherwise. Moreover, both properties have an internal dimension and an external one. Internal effectiveness and efficiency can be estimated within a given setting. In education, for example, they can concern the impact of a particular teaching method on

students in the same institution or program, or the specific use of certain resources in the same educational sector. By contrast, external effectiveness or efficiency are extra sectorial, as they extend comparison beyond the setting in question. In the case of education, they can relate to the impact of a certain type of training in several sectors of the economy, or the outcomes of school tracks in terms of individual costs and benefits.

Lockheed and Hanushek (1994) constructed a typology of educational function stemming from the different relationships arising between the stimuli to the school system the inputs and its observable products, the outputs (see below, Figure 1)

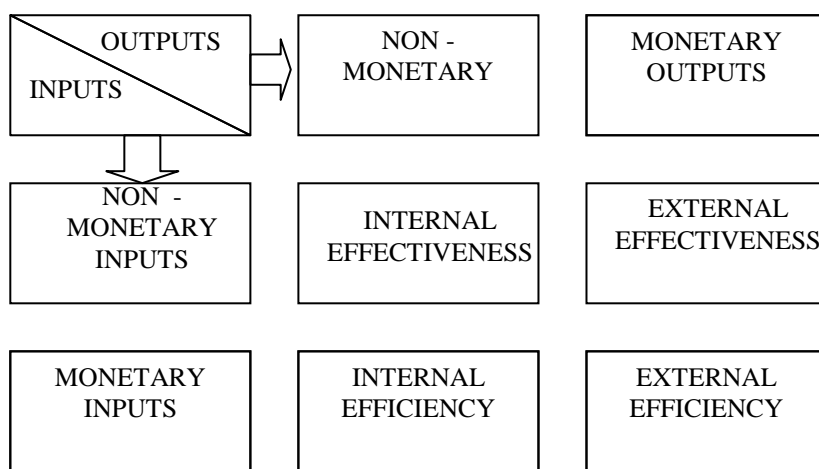


Figure 1: Effectiveness and efficiency of educational systems.
Source: Adapted from Lockheed and Hanushek (1994).

In planning education policies, effectiveness and efficiency are usually pursued together. Though they refer to different types of outcome, the two goals are always seen as related. While all efficient school organizations are also effective, given that effectiveness is an essential prerequisite for efficiency, the converse is fairly frequently heard: not all effective school systems are also efficient. Every inefficient school system (or educational institution) can be inefficient in its own way. Profitable use of resources, in fact, depends on a number of elements; broadly speaking, however, there are two aspects that are most important. The first, the so-called “allocative efficiency”, regards how resources are earmarked, whether they be human resources (teachers, technical-administrative personnel and aids) or tangible resources such as funding or technological facilities. The second, called “technical efficiency”, regards the optimal use of the resources themselves.

The taxonomy proposed by Lockheed and Hanushek is of considerable interest, as it makes it possible to focus on the different types of resource (monetary and non-monetary) and the different

levels (internal and external) involved in analyzing educational effectiveness and efficiency. The problem, however, is that there are no reliable estimates of the so-called intangible assets. In general, “assets” are defined as any goods that can generate future benefits, while “intangible” denotes the particular category of assets that are not physical in nature. In the world of education, intangible assets make up most of the school’s total value, as they include the skills of teachers and staff, new ideas, good teaching practices, contacts with the local area and relationships with parents, and much more. Together, as Lev (2001) maintains, intangible assets are an extremely important capital which he calls “organizational capital” on which the overall success of an organization depends. While many studies have examined the role and weight of intangible assets in industry and industrial services, few have addressed the part they play in public general-interest services. Estimates of efficiency in such services thus concentrate primarily on monetary assets. In a time of tight budgets and beleaguered public finances, cutting expenses is thus a priority goal, particularly in view of the fact that spending less does not necessarily mean having to accept lower performance.

In education, a lengthy series of studies have ratified the findings published by Coleman and colleagues (1966) nearly fifty years ago: students’ levels of attainment are only weakly associated with the amount of resources provided to schools. This was recently confirmed by the OECD’s Programme for International Student Assessment (PISA), a survey that subjected a sample of 15-year old students from over forty countries to tests of their reading, mathematical and scientific literacy. When we compare spending per student in compulsory education (given that young people in this cohort are still at compulsory school) in several of the countries that achieved the best reading scores in the 2009 survey, we find an enormous variability. Good performance (scores above 500) correspond to a wide range of annual per-student outlays, both well below and well above the OECD average of 8070 purchasing power parity-adjusted US dollars.

The OECD statistics also show that many countries achieve rather poor performance despite massive spending in education. These countries include Luxembourg, with the highest yearly expenditure (16,632 USD) and whose young people score only 472 on average, as well as the Slovak Republic (11,403 USD in spending and an average score of 477), Austria (9801 USD in spending and an average score of 470) and Italy (8661 USD in spending and an average score of 486).

Before taking students’ scores in standardized tests, or other types of performance indicators, as expression of the success of education systems, it is advisable to check the relationships that can link school outcomes to presumable sources of variation. As suggested by Johnes (2004), it is also useful to emphasize that school systems:

- operate with a large variety of internal structures,
- operate with different external contexts and highly varied local systems,
- produce multiple outputs (joint production) from a broad range of inputs, and are subject to different strategies, depending on the level of governance in question (internal, regional, national, European, international).

3.2.1. The Case of the Single Class Teacher in Italy

The Italian school system has recently been swept by a series of reforms with the two-fold aim of improving its effectiveness and efficiency. Recent statistical surveys and investigations indicate that Italy's schools turn out a lower percentage of graduates than those of other developed countries, providing them with an average quality of education that falls far short of excellent, despite the fact that funding is by no means inadequate. The reforms have affected all levels of education (primary, lower and upper secondary, and university) and were introduced, with varying degrees of acceptance and approval on the part of the public and educators, with no preliminary trial period. One of the innovations that proved most controversial with the general public and specialists in the field was the change in how teaching is organized in primary school, which in Italy lasts five years and is generally attended by children from six to eleven years of age.

While the younger students were previously grouped into classes with three teachers each dealing with a different area of learning: language and other forms of expression, math and science, and the humanities, who divided their time evenly between two different classes in the so-called "modular organization", the entry into force of Law 133 of August 6, 2008 introduced the "single class teacher". As Article 4 of this law states, "Pursuant to the objectives for rationalization primary school institutions shall set up classes entrusted to a single teacher and functioning according to a schedule of twenty-four hours per week".

This change put an end to the former practice whereby several teachers were present in the same class in any given period, and assigned a major role to the "single class teacher". This teacher is responsible for the entire core curriculum, and coordinates the work of the specialist teachers who deal with subjects such as foreign languages, religion, music, physical education or other disciplines that schools are now empowered to add independently to their curricula.

In the debate concerning the advantages of the single class teacher versus those of having several teachers in the same class, the contending positions are rooted in a variety of arguments. Supporters of the reform claim that very young students need to be able to relate to a single figure,

who helps them learn the basic skills of reading, writing and arithmetic. In addition, as single teachers do not have to divide their time among several classes, they can follow the progress of a smaller number of students, getting to know their individual characteristics better and thus provide personalized teaching. The reform's opponents, on the other hand, stress that having different teachers and being able to work with them in small groups enriches the child's learning experience. While these arguments center on educational and teaching considerations, the legislators who chose to return to the single class teacher⁴ focused more on the system's efficiency. Thus, the "Draft Policy of the Ministry of Education, Universities and Research, with the consensus of the Ministry of the Economy and Finance" of September 23, 2008 states that: "the intention is to combine the quantitative benefits of improving class structure and reducing teaching workload with those of higher quality school services, effective sizing of the system, and a more productive employment of teachers". The foreword to the "Draft Policy" notes that the student/ teacher ratio in Italy is lower than the OECD average, but this does not translate into high levels of attainment or even in the spread of educational credentials. It thus calls for measures for reducing waste and the underutilization of facilities and resources.

The reform of primary school teaching thus had two goals: to raise the student/teacher ratio (improving efficiency) and increasing students' knowledge and skills (improving effectiveness). Whether the first goal was achieved can be readily determined, and the Ministry of Education was able to announce the number of teacher cuts⁵ that would result from the reform at the outset. By contrast, monitoring the second goal is much less straightforward. The measure, whose declared aim is to ensure "an educational and organizational model which is better able to raise learning outcomes and which can be a factor in strengthening the educational relationship between teacher and student, simplifying and making the most of the relationship between family and school" is unclear as to the connection between the stated ends and the means chosen to achieve them. Nor is anything said regarding how and when results will be gauged.

Educational outcomes are influenced by many variables, situated at multiple levels and interacting with each other. The results of any innovation introduced will differ according the student's social class, his or her personal expectations and or those of the family, teacher motivation, the type of educational orientation, and many other factors. Nevertheless, comparing

⁴ Italian elementary school classes were held by a single teacher until Law 148 of June 5, 1990 introduced the multiple-teacher approach after a trial period.

⁵ For the three years following the reform, the Ministry estimated that 87,000 teaching jobs would be eliminated through attrition at all levels of education. For primary school teachers, it was announced that a total of around 28,000 positions would be cut in 2009-2012, including 9,245 in the 2011-2012 school year.

student performance before and after the reform was introduced can help shed light on whether the expected goal was achieved.

For a number of years, INVALSI, the Italian national institute for educational evaluation, has administered standardized tests of the knowledge and skills in mathematics and Italian acquired by students in a number of grades of compulsory school, bearing in mind the learning outcomes established for the two subjects in question. A variety of standardized tests are used, which may involve either multiple-choice or open-ended response formats (e.g., essays and performance tasks), and are devised, administered, graded and reported in such a way as to avoid partial or ambiguous interpretations of the results.

The national evaluation system plays a key role in gauging the effects of education policies. The INVALSI tests provide a historical series of student attainment data that makes it possible to compare changes in the performance over the long term and after the large scale introduction of organizational and or teaching innovations.

Evaluating education, however, is a far more complex activity. Its main purpose is not merely to determine what outcomes were achieved and whether they met expectations and goals. Strictly speaking, if the links connecting a situation with a prior action taken in order to bring about change are not identified, we cannot evaluate the outcomes of the action. A well conducted evaluation thus requires that a set of variables (for the context, input, process and product) be monitored to determine whether or not they are related to the quality of the outcome.

For analysis to be complete, moreover, it must also include an *ex ante* stage carried out for forecasting purposes which can provide guidance in selecting between alternative measures, outlining scenarios based on an analysis of current trends, as well as an *in itinere* or ongoing evaluation during the implementation phase to check whether the measure has led to unexpected consequences.

The gradual spread of a new approach to assessing students based on standardized tests In Italy, unlike other countries with advanced school systems, structured tests were long considered as inappropriate for verifying attainment, and other assessment methods chiefly centering on an oral presentation of the course content learned by the student were preferred.

Recently, thanks to the greater emphasis given to the work of the INVALSI evaluation institute and participation in international programs such as the Progress in Reading Literacy Study (PIRLS) and the Trends in International Mathematics and Science Study (TIMSS) conducted by the International Association for the Evaluation of Educational Achievement (IEA), we have seen the rise of large-scale tests that, building on major advances in statistical techniques (Item Response Theory, for example), provide valid, reliable data on student achievement.

The current trend, though doubtless positive inasmuch as a rigorous evaluation can stimulate improvement in course quality, is not without its downsides. It is widely recognized, for instance, that schools attempt to ensure that good test scores are achieved by devoting increasing amounts of classroom time to exercises preparing students for this type of assessment, cutting into the space available for indepth coursework or creative activities. In certain situations, teachers have even been seen to provide their students with the correct answers during nation-wide tests, fearful that poor scores would reflect badly on their own work (INVALSI, 2011).

This aspect must not be forgotten, if we are to avoid attributing excessive importance to students' scores on standardized tests. As in the case we have just mentioned, information of this kind is not always of great assistance in formulating a judgment regarding the effectiveness or ineffectiveness of a given educational innovation.

Because of its intrinsic difficulties, evaluating education policies is thus often limited to a mere description (qualitative and/or quantitative) of the efforts made to improve the school system. At times, it is accompanied by a judgment regarding effectiveness or ineffectiveness, consisting in generic considerations about the "quality" of the service, where quality is for the most part seen as a question of compliance with organizational standards or the level of satisfaction expressed by users. Ever more frequently, the need to follow the standards of the European Community is cited as the justification when an educational measure is adopted.

In the case of the introduction of the single class teacher, the measure's proponents did not fail to point out that assigning a team of three teachers to each class was entirely unknown outside of Italy. If we look at the EU- RYDICE statistics (2011), in fact, we see that elsewhere, from Portugal to Lithuania, from Greece to Finland, and in England and France, primary school teaching is in the hands of a single teacher who is responsible for the students' learning and, in certain cases, is assisted by specialist teachers for physical education, art, and so forth⁶. In some countries such as the United Kingdom and Malta, there is a single teacher for each grade, or in other words, the students change teacher every school year, partly in order to prevent any situations of conflict that may arise between teacher, student and family from spiraling out of control, but chiefly to enable teachers to improve their teaching methods for children of different ages.

Reducing the number of teachers per student and bringing it closer to the European Union average is a legitimate objective, especially in view of the fact that having a large number of teachers is not matched by an increase in classroom time, which is often limited to the morning

⁶ In Germany, the situation is hybrid: there is a single teacher in first and second grade, and specialized teachers are introduced in the third grade so that the student can become accustomed to having several educators.

hours, particularly in Central and Southern Italy. Nevertheless, to assume that achieving this goal also leads to an improvement in teaching quality is perhaps over-bold. The many studies of teaching effectiveness demonstrate the importance of other teacher variables: training and continuing education, good pay and other economic incentives, career prospects: all factors that are entirely absent from the Italian school system.

4. METHODOLOGICAL APPROACH

4.1. Research problem

The aim of the research was to identify the major factors, at pupil level and school level, influencing scores for reading and mathematics among the sixth year pupils in Kenya and Italy. Pupil-level factors include socio-economic status, sex, grade repetition and extra tuition, whereas school-level factors include school resources, school location, and pupil-teacher ratio.

4.2. Methods and instruments

In the Sacmeq research, the sample consisted of all pupils at the sixth year in 2007 who were attending registered mainstream primary schools. This definition used a grade-based description (and not an age-based description) of pupils because the latter would have required the collection of data across many grade levels due to the high incidences of “late starters” and grade repetition.

The data was selected using a stratified two-stage cluster sample design based on the technique of a lottery method of sampling proportional to size, with the assistance of Samdem software (Sylla et al., 2003). At the first stage, schools were selected in each province in proportion to the number of pupils in that region in the defined target population. At the second stage, a simple random sample of 25 pupils was taken within each selected school.

In order to avoid selection bias, precautions were taken to ensure that school heads and teachers did not have any influence over the sampling procedures within schools. This is because school heads and teachers might have felt they had a vested interest in selecting particular kinds of pupils, and this could have resulted in major distortions of sample estimates (Brickell, 1974).

The sample contained 4436 of sixth year pupils, 733 teachers and 193 schools. For this study, four main questionnaires (pupil, teacher, school head, and school information) were used. It is important to note that Sacmeq questionnaires were subjected to careful thought, thorough examination, and stringent refinement before they were administered. The questionnaires were developed by a committee of experts consisting of members drawn from all Sacmeq countries, SCC staff, IIEP staff, and private consultants. The investigation was conducted following field experiences gained from the previous Sacmeq II study, and recommendations arising from analyses of Sacmeq II data and policy questions raised by Sacmeq country ministries of education. These questionnaires were refined by the Sacmeq scientific committee, then piloted in each Sacmeq country and further refined before they were administered.

One important innovation in the development of questionnaires for the Sacmeq III study was introduction of a “Homework form” for pupils to take home. This consisted of questions to which the pupil might not know the answers (for example, parental education, estimates of travel distance to school, home possessions, whether or not their biological parents were alive). The parents, family members, or guardians were supposed to help them in filling in. This considerably reduced the number of missing values in the Sacmeq III study compared with previous Sacmeq studies.

The quality of the data provided by the school heads, teachers, and pupils was examined in two ways.

- Firstly, at the time of data collection, the data collectors who visited the schools verified the actual existence and conditions of the school resources such as library, school head office, and staff room. They also verified the official school records about the information provided by pupils such as their gender, age, days absent, and whether or not their parents were alive.
- Secondly, similar questions were included in the school head, pupil and teacher questionnaires, in this way helping to verify the responses given by the respondents during data cleaning.

For the Invalsi inquiry, the data was collected from the second week of May and completed on 18th June of the 2011/2012 school year. The sample consisted of 1.986 classes extracted from 27.402 classes and totalling to 611.663 students nationwide from public and private schools. The tests were administered, monitored, recorded and supervised by an external invigilator to ensure a smooth running of the exercise.

In order to prepare all the materials needed for the administration of the tests, all the schools countrywide had to register online by filling a special form designed by the Invalsi. The form consisted of:

- personal data (name, address, email);
- the number of classes for each of the levels involved in the survey;
- the number of students and the presence of students with visual disabilities.

The online procedure minimized the use of telephone calls, this way reducing the waiting time for the results and making communication more efficient. In addition to the tests, more information was collected on the pupils’ family background, nationality, school environment, parent’s occupation and education, and attendance of pre-school units. However, this information was collected by individual school secretaries and transmitted directly to Invalsi. To ensure a detailed analysis of the results a specific protocol was prepared for the online restitution of the data to the Invalsi.

Before administering the final tests, a pilot sample was first tested nationwide. A pilot sample is a research instrument used to verify some of the psychometric aspects which are important in order to obtain reliable and valid tests.

For the pilot sample, schools were extracted according to a statistic sample covering the major regions (North East, North West, Central, South and Islands). Each relevant class at the stage of pre-testing was involved in a single administration, either Italian or Mathematics. In this stage of pre-testing, in order to avoid disruption of the educational organization, a single test was administered at a time thus engaging the students for a maximum of two hours.

As far as the qualitative research is concerned a purposeful mixed methods sampling (Barbour:2007) was applied. This means that individuals and sites were selected purposely because they had a knowledge, understanding and suited the research problem. Purposeful sampling is sometimes called *purposive* or *judgment* sampling: “In judgment sampling, you decide the purpose you want informants to serve, and you go out to find them” (Bernard 2000:176). In addition, a combination of individual interviews and group discussions were used to collect information. The advantage of combining focus groups and one-to-one interviews (which are close cousins and stem from similar epistemological approaches), is the much wider range of possibilities, some of which include combining focus groups with quantitative methods (Flick:2007b).

The sites for the study were a public library and middle level schools. The public library was a suitable site for the Italian research as it made it easy to meet and interview a wide range of individuals. For both Kenya and Italy two types of schools were sampled, those located in urban areas and those in rural areas. The sample consisted of 8 focus groups (made up of 8 to 15 individuals) and 17 individual interviews. The interviews were carried between November 2012 and February 2013.

For the Italian sample we had:

- one focus group of middle level students (all boys) aging from 11 to 13 years;
- one focus group of middle level students (all girls) aging from 11 to 13 years;
- one mixed focus group of teachers, students and parents;
- one focus group of non native parents (all women);
- 7 different individuals for the one-to-one interviews (teachers, students, head teachers).

While the Kenyan sample comprised of:

- one focus group of head teachers and teachers;
- two mixed focus groups of middle level students (age 12 to 14 years);
- a focus group of middle level teachers;
- 10 different individuals for single interviews (teachers, students, parents, head teachers).

In both cases semi structured questions were used to guide the informants and ease the collection of as much information as possible. Before the main interviews a pilot trial was carried out on a small number (3) of individuals in both countries in order to establish whether these were likely to elicit the sort of data required for the research project at hand. This procedure also indicated whether particular lines of questioning and terminology are acceptable to participants (Barbour:2007). In Italy the contact with the informants was direct (face-to face) whereas the Kenyan one was indirect (online).

The online interviewing was done through: short messaging texts (SMS); email messages; telephone, and chat through face book. The question form with empty spaces for the answers was sent to individuals and leaders of the focus groups through email or face book messages. The filled forms were sent back using the same instruments after which further information was collected through chat, sms, and telephone calls. This also served as a clarification of the answers which were not clear. One general guideline in qualitative research is not only to study a few sites or individuals but also to collect extensive detail about each site or individual studied. The intent is not to generalize the information but to elucidate the particular, the specific (Pinneger & Daynes, 2006).

5. DATA ANALYSIS AND RESULTS

5.1. Data analysis

5.1.1. Sacmeq data

The information collected using the questionnaires was used in the construction of the predictor variables involved in the analyses. In some cases, one question was used as a predictor, while in other cases questions were recoded to make them more meaningful for analysis purposes. For example, in the question below the original coding was from 1 to 5 but it was recoded into 0, 0.5, 1, 2, and 3 for the purpose of giving weights to the responses that roughly corresponded to the number of years of preschool attendance by the pupil.

How long did you attend a preschool, kindergarten, nursery, reception, etc., before Grade 1?

(Please tick only one box.)

<i><u>original coding</u></i>	<i><u>Recoded into:</u></i>
1. <input type="checkbox"/> <i>I have never attended a preschool.</i>	0
2. <input type="checkbox"/> <i>A few months</i>	0.5
3. <input type="checkbox"/> <i>One year</i>	1
4. <input type="checkbox"/> <i>Two years</i>	2
5. <input type="checkbox"/> <i>Three or more years</i>	3

In other cases, two or more variables were used to form a predictor; for example, the number of female teachers in the school was divided by the total number of teachers in the school to form the variable “Proportion of female teachers”. In yet other cases, a number of questions were combined to estimate, for instance, a pupil socio-economic status factor classroom resources factor, and school resources factors. Information about the predictor variables involved in the analyses is given in *Appendix 1*.

Figure 2, shows the general two-level model that was hypothesized for factors influencing pupil achievement in reading and mathematics. This model was examined separately for reading and for mathematics data. The general model is based on existing literature on pupil learning, especially Carroll’s model of school learning (Carroll, 1963) and Creemers’ model of effective classrooms (Creemers, 1994).

The hierarchical structure of the model, shown in figure 2, has pupils at level 1 and schools at level 2: that is, pupils nested within schools.

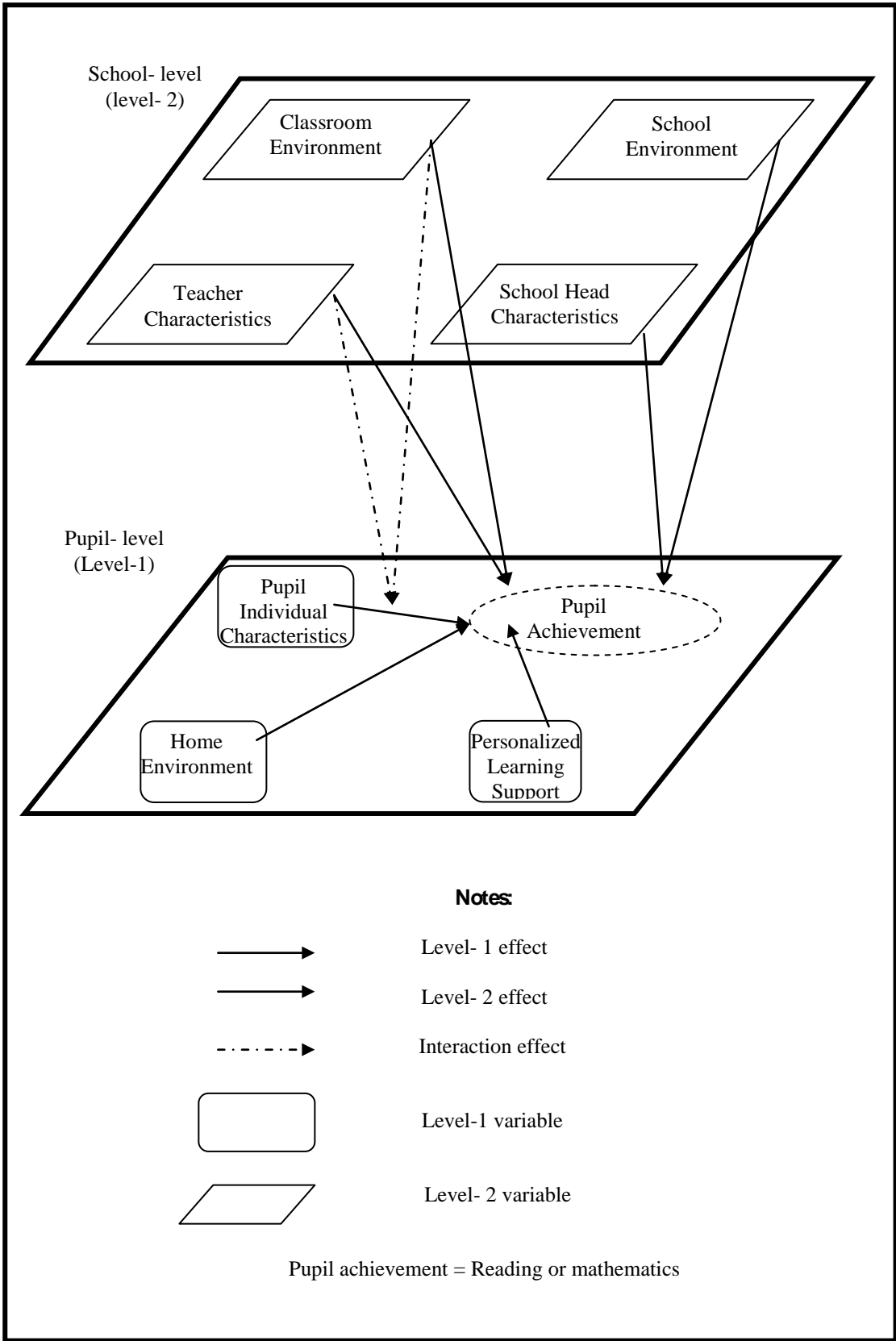


Figure 2: Hypothesized two-level model of pupil achievements for the Sacmeq III study

As can be seen from figure 2, three categories of variables were hypothesized to directly influence achievement at the pupil level: “*Individual characteristics*” (e.g. sex and age), “*Personalized learning support*” (e.g. preschool attendance, extra tuition, and homework help at home), and “*Home environment*” (e.g. pupil SES, number of siblings, and household tasks). Four categories of variables were hypothesized to directly influence achievement at the school level: “*Teacher characteristics*” (e.g. sex, education, and professional qualifications), and “*Classroom environment*” (e.g. class size and classroom resources). Other variables were “*School head characteristics*” (e.g. sex, education level, and experience), and “*School environment*” (e.g. school resources, type of school, pupils’ behaviour problems, and the contextual climate such as average pupil SES and the proportion of girls in the school).

Before commencement of multilevel analyses the correlations between variables were examined in order to get a general “feel” of the associations between variables, and also to check potential problems because of any multicollinearity and suppressor variable relationships in the model (Keeves, 1997). The variables were then examined using simple multiple linear regression (MLR) models using SPSS software to identify which of the variables (listed in *Appendix 1*) warranted further scrutiny using multilevel procedures. In this regard, a variable was deemed worth of further scrutiny using the multilevel approach if it was significant in the MLR models at the $p \leq 0.05$ level. The multilevel analyses were carried out using HLM6 software (Raudenbush *et al.*, 2005), following the logic employed by Raudenbush and Bryk (2002) in their descriptions of these types of model. For each school system, two multivariate data matrix (MDM) files were built, one for reading and the other for mathematics. Weighting (with sampling weights calculated to cater for the design of this study) was undertaken during the analyses.

The initial step in the HLM analyses was to run so-called “null models” in order to estimate the within- and between-school variations for each subject and for each school system. This was followed by building up the pupil-level models, which involved adding pupil-level predictors to the models, but without entering predictors at the school level. At this stage, a “step-up” approach (Bryk and Raudenbush, 1992) was followed to examine which of the pupil-level variables had a significant (at $p \leq 0.05$) influence on the outcome variables. The step-up approach involved progressive addition of significant predictors into the model, one at time. Finally, school-level predictors were added into the models using the step-up strategy mentioned above. The level-2 exploratory analysis subroutine available in HLM6 was employed for examining the potentially significant school-level predictors (as shown in the output) in successive HLM runs.

5.1.2. Invalsi data

Also for the Invalsi research a multilevel model of analysis was used to explore the determinants of students' performances (Lamb & Fullarton: 2002; Fekjaer & Birkelun: 2007; Dronkers & Robert: 2008). It is important to note that this method, is not common in the Italian literature. In the analysis two levels of variables were employed to account for the hierarchical structure of the data: students (level-1 data) were sorted into schools (level-2), and schools were further sorted into geographical macro-areas characterized by different socio-economic characteristics likely to affect students' results. As covariates at individual level, students characteristics were examined: gender, nationality, age, and social economic and culture status; at school level: school location variable was examined.

The results of the Italian and Mathematics tests of SNV 2012 were presented by school level. The processing of the collected data allowed for comparison of the mean scores and distribution of scores for macro-regions, regions and countrywide. For each level the presentation of results was organized as follows:

- the overall results countrywide;
- the gender differences;
- differences between native and non native students;
- age (regular students, early starters and late starters);
- differences in the results of the tests.

The results of the tests were then reported on a scale of score similar to that used in international studies (OECD-PISA, IEA-TIMSS, PIRLS-IEA, etc..) based on learning rather than in terms of percentages of correct answers. The above scale is based on Rasch scores whose main advantage is to express in the same metric, the results achieved by each student and the difficulty level of each question. In this way it is possible to carry out solid and most informative analysis and comparisons between different areas of the country and also between different parts of the tests. The measurement scale is characterized by some reference values: the average value, which summarizes the overall scale, and the standard deviation, that measures the variability of the results compared to the same average value. In many respects, these values are set in the conventional manner and are a reference point for any analysis and comparison. On the scale used in this research the national average was set at 200 and standard deviation at 40. A value greater than 200 positions a single school or an entire region above the national average and a standard deviation over 40 (of a region or a specific geographical area) indicates an internal variability than that found in national

level. An average value less than 200 and standard deviations smaller than 40 was interpreted in a speculative manner.

5.1.3. Qualitative data

The data analysis of the qualitative research involved multiple focus groups and individual one –to-one interviews. It’s important to note that analyzing focus group data is much more complex as compared to data analysis from individual interviews due to the large quantities of information.

Firstly the information gathered from the informants was transcribed in scripts immediately after the interviews and discussion groups. This was to ensure that no information was forgotten or left out.

Secondly, the information collected was open coded into themes bearing in mind the research problem that was to identify the major pupil-level and school-level factors influencing scores for reading and mathematics among the sixth year pupils in Kenya and Italy.

Thirdly, these codes were grouped into categories at pupil (pupil age, sex origin....) and school (school location, school resources...) level.

Finally the categories were condensed into sub-categories (Strauss and Corbin: 1998), figure 3. The massive data collected is represented in tables 1 and 2 in the appendix.

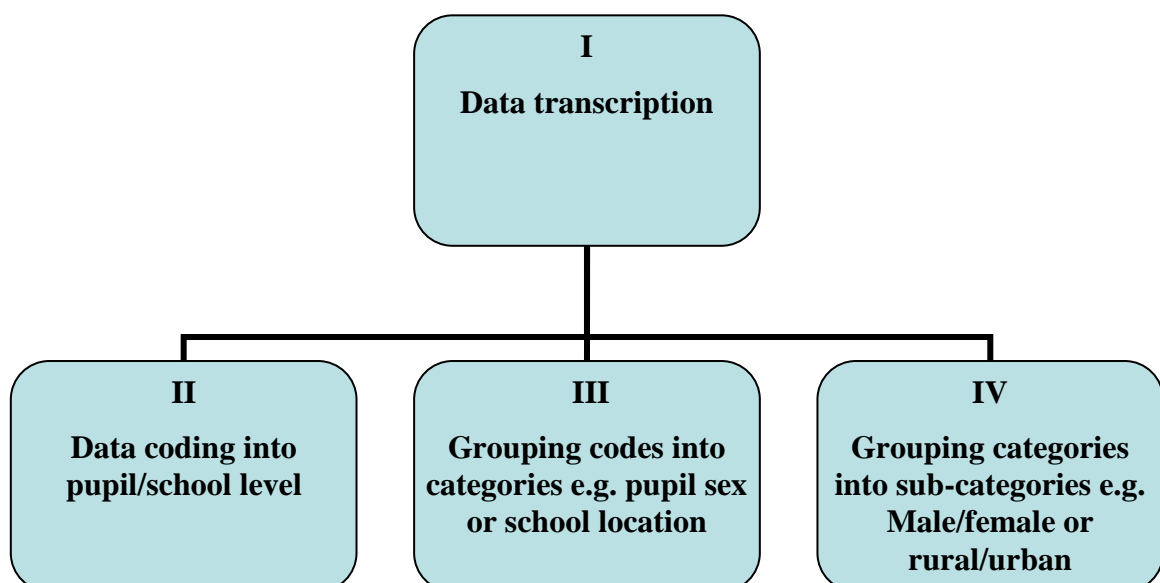


Figure 3: A summary of the analytical procedure

5.2. Results

5.2.1. Sacmeq

The standardized regression coefficients of the variables that were significant (at $p \leq 0.05$) in the final models are presented in *Tables 2* and *3* for the reading and mathematics models respectively. Coefficients for the pupil-level variables are in the first panels of *Tables 2* and *3* while those for school-level variables are in the second panels. The corresponding unstandardized (metric) coefficients for these variables are displayed in *Appendices 2* and *3* for reading and mathematics respectively, together with the variance components. Perhaps it is worth noting that the signs of coefficients indicate directions of effects, which can be interpreted from the coding. It might also be worth noting that absolute values of standardized regression coefficients can be used to rank variables by their relative degree of influence on the outcome within the same sample (Hox, 1995). Generally, in research studies in education, a standardized regression coefficient is considered important if its magnitude taken in absolute terms is ≥ 0.10 . The columns labelled T1 and T2 in *Tables 2* and *3* give counts of the numbers of times the variable was identified as “significant” ($p \leq 0.05$) and “important” (standardized coefficient $\geq |0.10|$) respectively across the school systems.

Pupil –level variables	Regression coefficients	T1	T2	School level variables	Regression coefficients	T1	T2
Pupil age	-0.17	12	6	Teacher in-service training	0.07	2	0
Pupil sex	-0.06	11	3	Teacher frequency of meeting parents	0.06	1	0
Grade repetition	-0.17	15	9	Proportion of female teachers	0.10	2	1
Days absent	-0.5	13	2	School head sex	0.07	1	0
Social-economic status	0.05	14	11	School head age	-0.13	1	1
Number of siblings	-0.04	8	1	School resources	0.11	10	6
Learning culture	0.07	8	1	School location	0.11	8	7
Homework	0.10	12	3	Pupil-teacher ratio	-0.08	5	2
Travel distance to school	-0.04	4	0				

Table 1: Standard regression coefficients of the variables in the reading models

Note: Standard regression coefficients in **bold** text are $\geq |0.10|$; T1 and T2 are numbers of times the variable was identified as significant ($p \leq 0.05$) and important (standardized regression coefficient $\geq |0.10|$).

Pupil –level variables	Regression coefficients	T1	T2	School level variables	Regression coefficients	T1	T2
Pupil age	-0.14	9	4	Teacher subject matter knowledge	0.07	5	1
Pupil sex	-0.15	13	7	Teacher days absent	-0.07	4	0
Grade repetition	-0.05	13	6	Private school	0.14	3	3
Days absent	-0.04	11	2	Free school meals	0.10	4	3
Social-economic status	0.05	13	8	School location	0.09	7	3
Number of siblings	-0.04	6	0	Pupil-teacher ratio	-0.09	5	1
Learning materials	0.03	7	1				
Homework	0.05	11	1				
Extra tuition in mathematics	0.05	6	2				
Travel distance to school	-0.05	4	0				

Table 2: Standard regression coefficients of the variables in the mathematics models

Note: Standard regression coefficients in **bold** text are $\geq |0.10|$; T1 and T2 are numbers of times the variable was identified as significant ($p \leq 0.05$) and important (standardized regression coefficient $\geq |0.10|$).

From the analysis, seven pupil-level predictors (Pupil SES, Pupil sex, Pupil age, Grade repetition, Days absent, Homework) emerged as significant across most of the schools for both reading and mathematics. From the results displayed in Tables 2 and 3, it can be seen that pupils from richer families were estimated to achieve better scores than pupils from poor families in reading and mathematics. The estimated difference in achievement scores between pupils from richer families (one standard deviation unit above the country’s mean SES score) and pupils from poorer families (one standard deviation unit below the country’s mean SES score) was calculated using the results from simple models involving the Pupil SES and mean Pupil SES variables as the only predictors in the model. In addition: pupils who were rarely absent from school performed better in both subjects than pupils who were frequently absent from school; pupils who were given homework more frequently and had it corrected and explained most days were estimated to achieve significantly better than pupils who were hardly given any homework, or pupils who were given homework but rarely had it corrected or explained, and pupils who spoke the language of

instruction at home more often were estimated to achieve better than pupils who rarely or never spoke the language⁷ of instruction at home.

As far as school-level factors are concerned, it can be seen from Tables 2 and 3 that school resources and school location variables had significant effects in most of the schools in reading and mathematics respectively. Pupils from schools that had many resources achieved better than pupils in schools with only a few or no resources and pupils in schools located in large towns or cities outperformed pupils in schools located in rural and remote areas. In addition, the variable Pupil–teacher ratio also had significant effects for both subjects, with pupils in schools with smaller pupil–teacher ratios performing better than pupils in schools with larger pupil–teacher ratios.

5.2.2. Invalsi data

The graphs in Figures 4 and 5, show the average and distribution of scores respectively in the Italian and Mathematics tests of the macro-areas, regions and Italy as a whole. The mean with its confidence interval (95%) are shown on each of the horizontal bars of the two graphs by a blue band and their values (the standard error of the estimate) are listed in the right column, in brackets. The symbol that appears next to these values, an arrow pointing upwards or downwards, indicates whether the average values recorded in the regional sample are significant in a statistical sense. The arrow pointing upwards shows the values recorded are above average, an arrow pointing downwards shows the values are below average, and if no symbol appears, this means that the values do not deviate significantly from the countrywide mean. The ends of the blank area in the center of each bar corresponds to 25 ° and 75 ° percentile of the distribution of scores, while the two ends of the rod outer bars in green correspond to the 5th and 95th percentiles. The total length of the bars offers an immediate representation of the extent in which scores are dispersed in various areas and regions.

⁷ English is the language of instruction in most of the Sacmeq school systems.

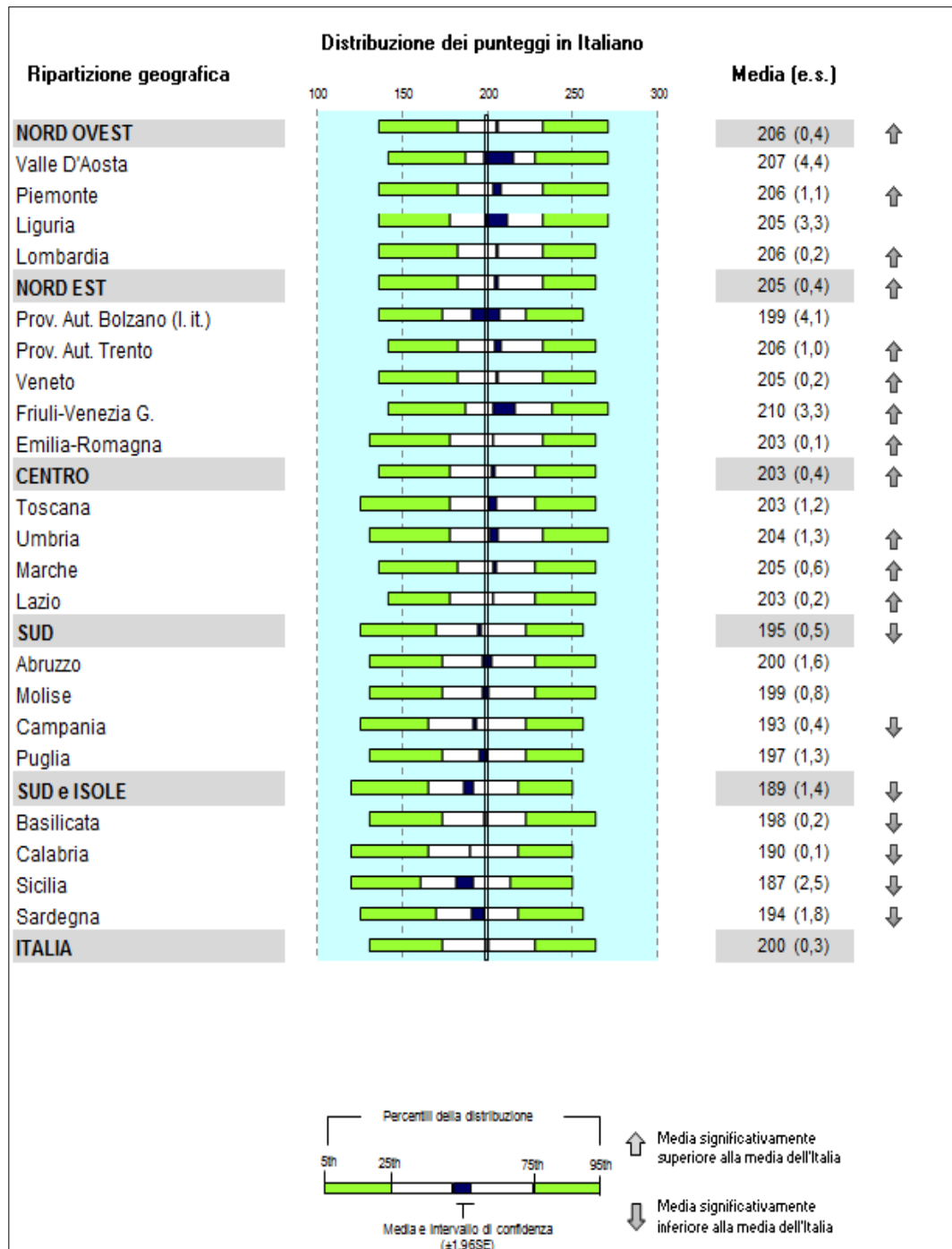


Figure 4: Geographical distribution of the Italian scores

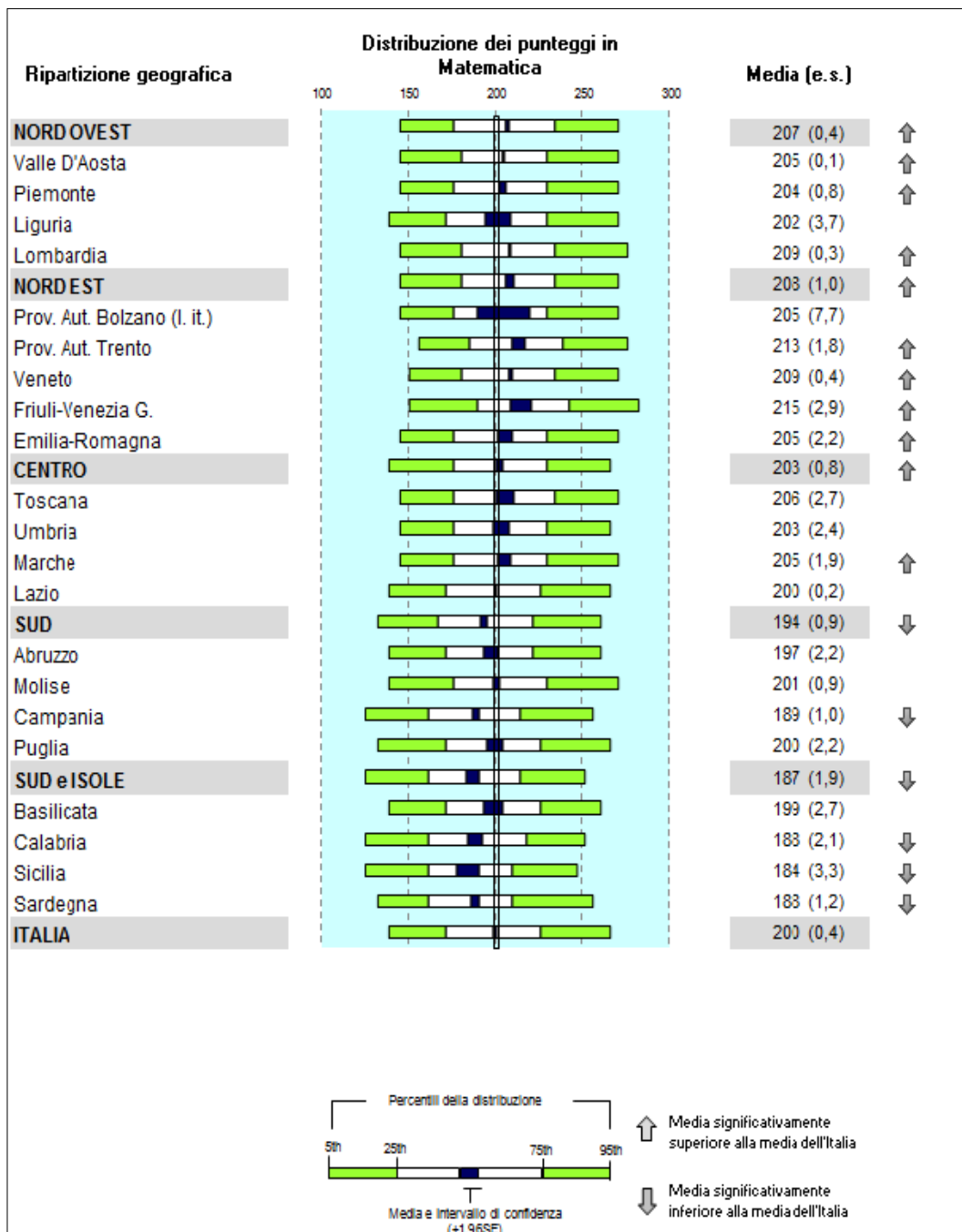


Figure5: Geographical distribution of the mathematics scores

As can be seen from the graphs, the two macro-northern areas have similar average scores and significantly above the countrywide average both in Italian and in Mathematics. In the central region the scores for both subjects are slightly above the average. Instead, the two macro-southern areas have results significantly below the Italian average in both disciplines. Typically, the regions tend to follow the trend of the macro-areas where they belong, but with some exceptions. The

region with the highest scores in both Italian and mathematics is Friuli and the one with the lowest result in both subjects is Sicily.

Looking at the distribution of the scores of individual macro-areas and regions and comparing them with the distribution of scores of all students in the sixth year, it can be seen that the more the relative bars grow to the left of the straight line in correspondence with the raised national average, the greater the number of pupils with inadequate skills.

Figures 6 and 7, show gender differences in the distribution of scores in Italian and Mathematics, for males (in red) and for females (in green). From the two graphs it is evident that girls performed better in Italian as compared to the boys whereas in mathematics the boys did better as compared to the girls. The region with the largest gap between males and females (16 points) is Bolzano while Basilicata has the smallest gap (less than a point). Generally it can be observed that an increase of the difference between males and females increases as the total number of students in a given area or region increases.

Similarly to what has been proposed for the analysis of gender differences, figures 8 and 9 are national distribution plots of the scores in Italian and Mathematics students according to the nationality. The foreign students of the second generation who sat for Invalsi tests was slightly more than 5% while the first generation was slightly more than 6% of the total number of students.

In general the average gap between first generation students and Italian students is 35 points in Italian and 20 points lower in mathematics, while among foreign students born in Italy and Italian students the gap is reduced, respectively, to 16 and 7 points. The differences, all significant, are in any case much more extensive in Italian than in Mathematics. At macro-areas level the differences between Italian students and first-generation students in Italian results of the two disciplines are always negative and significant, while for the differences between Italian students and students of second-generation the situation is more articulated but only with regard to mathematics. However, one must take into account whether the differences are significance as the number of students of immigrant origin varies from one territory to another.

Figures 10 and 11, show the differences in scores between regular students, early and late starters. From the total number of the students who sat for Invalsi tests, 10% were late starters while 2% were early starters. Generally, students who have accumulated at least a year late in their course of study achieve results significantly lower than the other students. Instead the difference between regular students and early starters is less marked. As can be seen from the results, in both subjects, the differences between late starters and regular students are always negative and statistically significant, while the differences between early starters and regular pupils are sometimes positive and sometimes negative depending on the area or region.

Figures 12 and 13, show to what extent the socioeconomic cultural background (ESCS) affects the performance of pupils in mathematics and Italian. From the technical point of view such a study is obtained through the analysis of residues of a Univariate regression model whose only regressor is ESCS indicator.

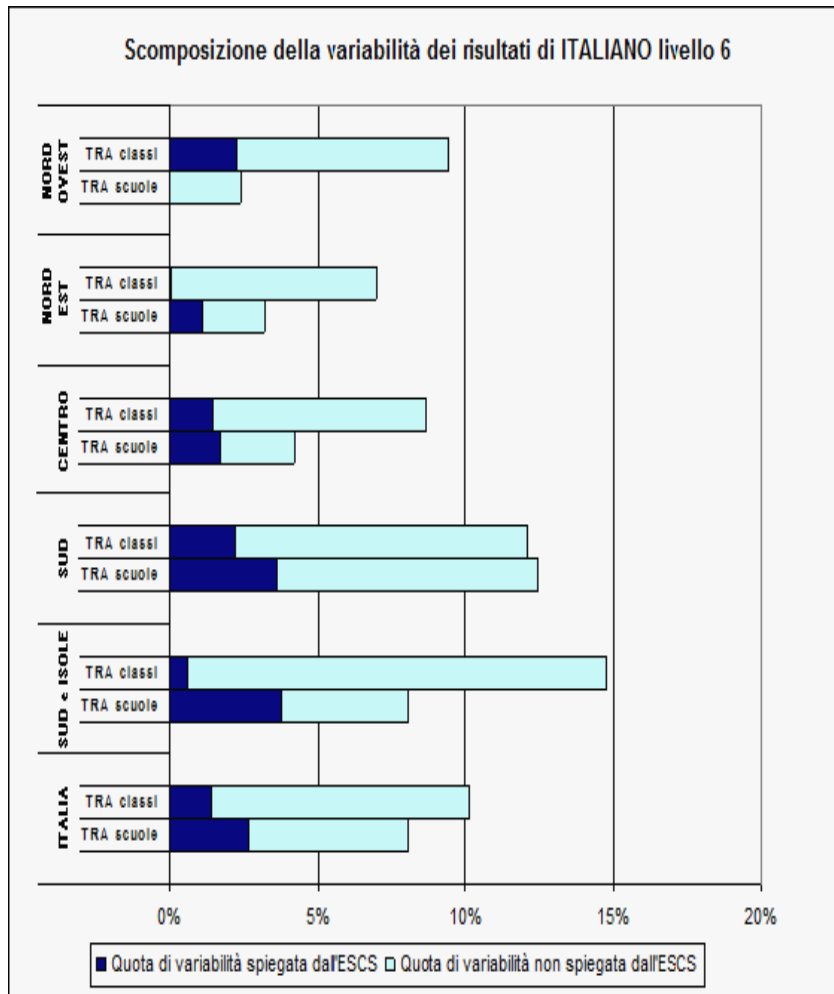


Figure 12: The effects of Social-Economic and cultural factors in Italian scores

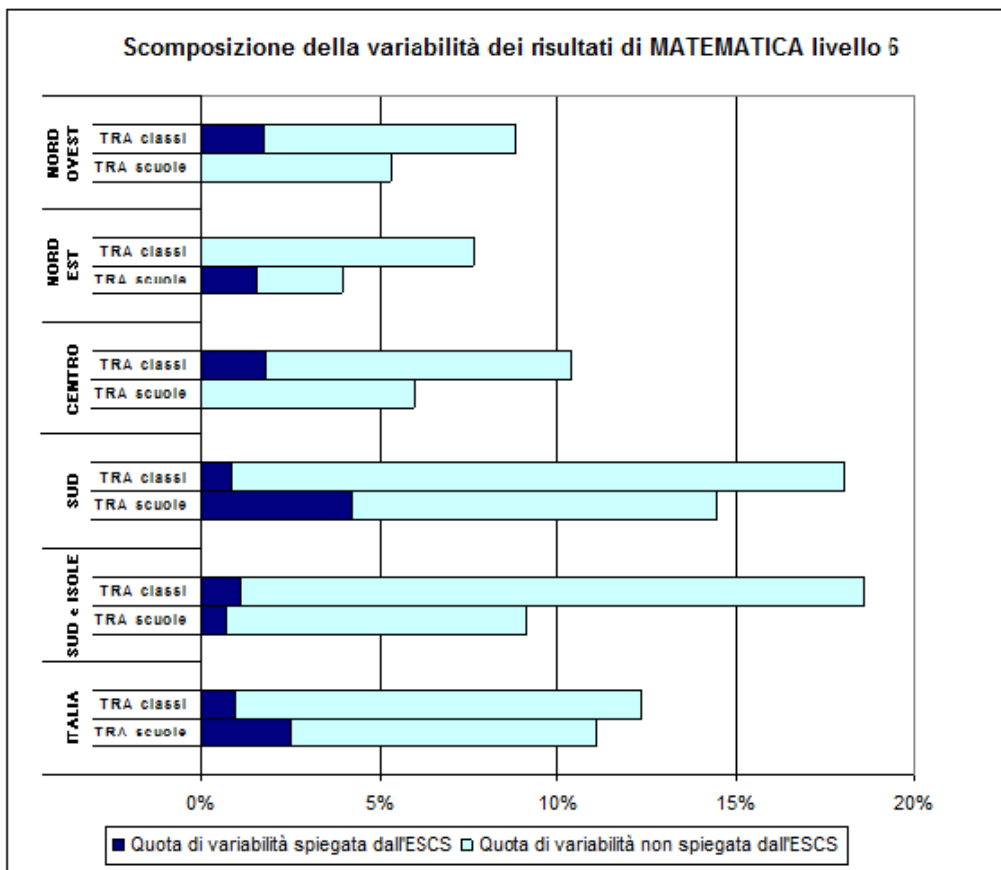


Figure 13: The effects of Social-Economic and cultural factors in Mathematics scores

It is clear that social dissimilarity between classes, could be derived from practices of *informal tracking* within schools. The results allow us to conclude how non-random allocation of students across classrooms on the basis of their social background, aggregated at province level, is strongly associated with an overall decrease in educational effectiveness, net from the geographical location of schools. Although we are unable to determine reasons behind practices of tracking students, we can confirm that tracking students according to their socioeconomic status (most probably derived from ability grouping practices) is observed to adversely affect the reading scores of students. Moreover, we can confirm that, in the Italian lower secondary, the goal to raise the system's educational effectiveness interact reciprocally with the objective to respond effectively to the principle of equal opportunities of academic success.

5.2.3. Qualitative data

Tables 3 and 4 illustrate the results of the direct (Italy) and indirect (Kenya) qualitative research. The common variables among the informants that influenced scores in both reading and mathematics at pupil-level are:

- pupil age, in both the school systems regular and early starters performed better than late starters. This was also observed in the Sacmeq and Invalsi studies;
- Pupil sex, in Italy boys did better in Mathematics and girls in Italian. Whereas in Kenya both girls and boys are almost at the same level. This is due to gender equality campaigns going on in the country. Previously boys used to out perform girls in both reading and mathematics as indicated by the Sacmeq study;
- Social-economic and culture status, this is the most important factor affecting the pupils performance in both the school systems. In Kenya pupils from rich families performed better than those from poor families. Rich families have more resources to support their childrens' learning as compared to the limited resources available among poor families. In Italy pupils with parents with a high level of education performed better. Education in Italy is never given much weight which is more or less a problem of learning culture;
- The other factors are extra tuition, grade repetition (associated with pupils age) and pupils origin (native and non native). These variable had similar effects to those in the Sacmeq and Invalsi studies.

Variable	Kenyan schools	Italian schools	notes
Pupil age: regular, early starters, late starters	Regular students perform better, early starters are on average and late starters are poor performers	Both regular and early starters do well whereas late starters do poorly.	Age range 11-14 years
Pupil sex: male/female	No much difference in performance but boys tend to do better in mathematics and girls in reading	Boys do better in mathematics and girls do better in reading	Reading refers to the competency of Italian and English language
Socio-economic and culture status: home possessions, quality of home, parental occupation, parental level of education	Pupils from rich families performed better due to availability of learning materials and personalized learning support.	Performance varied with the level of education of the parents, the higher the level the better the performance, the lower the level the poor the performance	In Italy there is no much difference in performance between rich families and poor family at a provincial level but varies when a countrywide situation is considered.
Extra tuition: homework help at home, pre/post school	Pupils who had a homework help at home did better.	Pupils who attended pre/post school homework centres did better.	Extra tuition is very common in Kenyan schools among rich families.
Grade repetition: once ,twice, more than three times	When applied once the pupils perform a little bit better but usually it does not have positive results on performance	Little positive impact on the performance. The more the pupils repeat grades the worse the performance	In Italy grade repetition is a common practice for the foreign students due to language barrier.
Pupils origin: native, non native 1 st generation, native 2 nd generation	There is no difference in performance due to low numbers of immigrants	The native pupils including the 2 nd generation perform better in Italian whereas among the non native pupils of the 1 st . generation the performance is below average.	In mathematics the difference in performance for the three categories does not vary much.

Table 3: Pupil level variables.

Variable	Kenyan schools	Italian schools	Notes
School resources: writing board, chalk/marker, cupboard, bookshelves, class/school library, computer laboratories, staff quarters, school hall, sports area/gym	Pupils performed better where there were more resources.	The more the resources the better the performance	In Kenya rural schools tend to have fewer resources.
School location: urban, rural	Pupils from urban schools especially in the outskirts perform better. The poorest performance is among the pupils from rural schools located in remote areas.	There is no much difference in performance between pupils from urban and rural schools	The urban schools were classified as those in the town centre and those in the outskirts. Whereas the rural ones were categorized in accessible and remote areas.
School environment: condition of school building, safety, pupil/teacher behaviour problems, gender issue.	A decent, safe and pupil friendly school has a positive effect on the performance.	A safe and calm environment has a positive impact on the performance.	In both school systems episodes of bullying are common in the schools.

Table 4: School level variables.

At school level the important variables which were identified as:

- Schools resources, schools with more resources had pupils performing better than those from schools with fewer resources. This variable was also significant in both Sacmeq and Invalsi surveys;
- School environment, a safe and calm school environment enhances better performances. In both school systems episodes of bullying were evidenced as a result of pupil behaviour problems. In Kenya frequent use of drugs and alcohol among pupils emerged as a reason for poor performance. The practice was more common in urban schools than rural schools;
- School location, in Kenya the performance of pupils from rural and remote areas were noted to perform poorer as compared to their counterparts in urban areas. In Italy school location was not important when considered at a

provincial level but at national level it had negative or positive effects depending on whether the school is located in the north, central, south or the Islands. This was identified as important in the Invalsi survey. School located in the north and central of Italy tend to perform better than those located in the south and the Islands.

CONCLUSIONS AND POLICY IMPLICATIONS

The main purpose of this work was to compare the key pupil- and school-related factors that contribute to variation in reading and mathematics achievement among the sixth year pupils of the compulsory school in both Kenya and Italy. In order to achieve this purpose, a two-level model of pupil achievement was hypothesized and analysed using multilevel procedures for each subject and for each school in the quantitative part, whereas in the qualitative part direct and indirect method of data collection was applied after which the analysis was done through coding of information into categories and sub-categories.

At the pupil level, the results from the analyses showed that pupil socio-economic and cultural background, pupil sex, pupil age, grade repetition, pupil origin, are common contributors to the variation in pupil achievement in the 2 school systems for both subjects. At the school level, the common contributors to the variation in pupil achievement were identified as school resources, school location. Importantly, based on the magnitudes of standardized regression coefficients of the variables in the final models, the results showed that the common contributors to variation in pupil reading and mathematics achievement across the 2 school systems were pupil socio-economic and cultural background, pupil age, people sex, and school resources. In addition, it was found that school location had a big impact on pupil reading and mathematics scores when considered at a national level.

For both subjects, the results also showed that in the Italian school system the origin of the pupil had a negative or positive impact on the performance. Native pupils performed better than non native pupils of the first and the second generation.

At this point it is important to ask ourselves what are the policy implications of the factors influencing pupil achievement. First, the ministries of education in both countries could consider taking actions for those variables that have been identified as important predictors of school achievement among pupils.

In general, grade repetition, socio-economic status, pupil age, pupil sex, school location, and school resources were found to be important predictors of pupil achievement across the school systems. For grade repetition, pupils who had never repeated grades achieved better scores than pupils who had repeated grades. In Kenya high levels of grade repetition have been blamed for increasing the overall cost of schooling because if many pupils repeat each year, school systems need to employ more teachers and build more classrooms. In most cases, pupils are made to repeat because it is believed that this will improve their academic performance. However, educational research has shown that grade repetition does not address the problems of low achievers

satisfactorily, and that potential solutions lie in early intervention, collaboration with parents, and supplementary instruction (Brophy, 2006).

In Italy grade repetition is mostly associated with immigrants, newly arrived foreign students enter schools at lower grades whenever their competences are evaluated to be inadequate to fruitfully join peers in the regular path. On a representative sample of 44,490 Italian students aged 11 and 13, Berchiolla (2011) show that the probability of a delay in the course of study for a first generation immigrant student is 17.85 times higher at grade 6 with respect to those of a native peer. Hence, looking at delayers means dealing with a group where students of foreign origin are overrepresented.

As expected, pupils from richer homes and with better-educated parents outperformed pupils from poorer homes and with less-educated parents. In order to minimize the effects of socio-economic background on pupil achievement in the long term, the education authorities may consider introducing special home intervention projects. These projects would involve training teachers on how to change parental behaviour in the home so that the children receive more encouragement and support for studying. Such home intervention projects have been implemented successfully in Malaysia (Norisah: 1982), and were credited with raising the achievement levels of children from disadvantaged families. Such projects could reduce the large social inequity in pupil achievement found in some schools (especially in Kenya) as well as reduce the problems of pupil absenteeism and grade repetition the long term.

For Pupil age, being older in 6th year was a clear disadvantage for both reading and mathematics, it is likely that older pupils feel out of place and thus less motivated to participate in school work than their younger counterparts. Incidences of over-age pupils could partly be blamed on the high levels of grade repetition discussed above. These over-age incidences could also be partly blamed on starting school late. This means that parents and education authorities should ensure that pupils start schooling at the official age of entry and also minimize grade repetition. In Italy the ministry of education and the ministry of Foreign affairs can work hand in hand to ensure family reunions are organized to coincide with the school year and also introduce Italian courses for families who intend to be reunited.

For pupil sex, the effect varied in the two countries. In Kenya boys outperformed girls in both subjects whereas in Italy boys did better in mathematics and girls in Italian. The authorities concerned should consider commissioning studies to examine the reasons for the poor performance of girls (especially in mathematics) and to identify ways of correcting this problem. Hungi and Thuku (2010b), analysing data from the Sacmeq II study for Kenya, suggested that gender differences in mathematics achievement in Kenya could be linked to how mathematics is taught in

Kenyan primary schools, the teaching materials used in mathematics classes, or the Kenyan culture, which is mostly male dominated and perceives girls as not being very able in mathematics and sciences. Perhaps these perceptions about girls' abilities in mathematics, and teaching approaches (or teaching materials) that disadvantage or discourage girls in mathematics, are common also in Italy.

School location and School resources were the other factors that were found to be important in the two school systems. Pupils in schools located in urban areas performed better than pupils in schools located in rural areas in Kenya, while schools located in the north and central of Italy performed better than those in the south and the islands, while pupils in schools with more resources did better than pupils in schools with fewer resources. Thus, the education authorities in the two countries should work hard to provide more resources to all schools despite their location.

In conclusion, an important question emerges which could be addressed in the future studies: What could be the factors affecting the quality of education in schools with the increased use of modern technology?

BIBLIOGRAPHY

- Bernard H. 2000. *Social Research Methods: Qualitative and Quantitative Approaches*.
- Brickell J. 1974. "Nominated samples from public schools and statistical bias." In: *American Educational Research Journal*, 11(4), 333-341.
- Brophy J. 2006. "Grade repetition." *Education policy series 6*. International Institute for Educational Planning. Paris
- Bryk A. Raudenbush S. 1992. *Hierarchical linear models: Applications and data analysis methods*. Sage Publications. Newbury Park, CA.
- Carroll J. 1963. "A model of school learning." In: *Teachers College Record*, 64, 723-733.
- Castaldi M. 1996. Gli indicatori dell'educazione: contributi dal progetto INES. *Dirigenti scuola*, 17(2), pp. 20-26.
- Coleman J., Campbell E., Hobson C., McPartland J., Mood A., and Weinfeld F. (1966). Equality of educational opportunity. National Center for Educational Statistics. Washington, DC.
- Council of the European Union. 2004. "Education & Training 2010". *The success of the Lisbon strategy hinges on urgent reforms*. Joint interim report of the Council and the Commission on the implementation of the detailed work programme on the follow-up of the objectives of education and training systems in Europe. No. doc. 6905/04 EDUC 43. Brussels, 3 March 2004.
- Creemers B. 1994. *The effective classroom*. Redwood Books. London.
- David S. 2010. *Doing Qualitative Research*. London: Sage.
- Dolata S. 2005. Construction and validation of pupil socioeconomic status index for Sacmeq Education System. A paper presented at the Sacmeq Conference (Paris, September 2005).
- Ferrer F., Ferrer G. and Baldellou, J. 2006. "Equity and segregation in the Spanish education system." *Prospects* 36(4): 547-571.
- Fitz G. and Tymms P. 2002. Technical and ethical issues in indicator systems: Doing things right and doing wrong things. *Education Policy Analysis Archives*, vol. 10 (n. 6).
- Flick, U. 2007b. *Managing Quality in Qualitative Research*. London: Sage.
- Fuller B. 1991. *Growing Up Modern: The Western State Builds Third World Schools*. New York.
- Goldhaber D., and Anthony E. 2004. Can teacher quality be effectively assessed. Working Paper, Seattle: Center on Reinventing Public Education, University of Washington.
- Hox J. 1995. *Applied multilevel analysis*. TT-Publikaties. Amsterdam
- Hughes, Rees and Mwiria. 1989. *Kenyan Women, Higher Education and the Labour Market*. *Comparative Education Journal* No. 25:179-195.

- Hungi N. 2010. What are the levels and trends in grade repetition? *Sacmeq Policy Issues Series, Number 3*.
- Hungi N., Thuku, F. 2010a. "Variation in reading achievement across 14 southern African school systems: which factors matter?" *International Review of Education*, 56(1).
- Hungi, N.; Thuku, F.W. 2010b. "Differences in pupil achievement in Kenya: implications for policy and practice." *International Journal of Educational Development*, 30: 33-44.
- Hutmacher W., Cochrane D. and Bottani, N. 2001. *In pursuit of equity in education: Using international indicators to compare equity policies*. Kluwer Academic. Dordrecht.
- IDS Working Paper No. 373. Nairobi: Institute of Development Studies, University of Nairobi.
- International Bank for Reconstruction and Development. 2008. *What is school based management?* The World Bank. Washington, DC.
- Jahangeer S., Jahangeer A. 2004. "School culture in a private secondary institution in Mauritius." *International Education Journal*, 5(2): 247–254.
- John W. 2007. *Qualitative Inquiry & Research Design: Choosing Among Five Approaches*. Thousand Rosaline Barbour. 2007. *Doing Focus Groups*. London: Sage.
- Johnes, J. 2004. Efficiency measurement. In G. Johnes, & J. Johnes (Eds.), *International handbook on the economics of education* (pp. 613-742). Cheltenham: Edward Elgar Publishing Ltd.
- Keeves J. 1997. "Suppressor variables." In J.P. Keeves (Ed.), *Educational research, methodology, and measurement: an international handbook* (pp. 695-696). Pergamon Press. Oxford
- Keller E. 1977. Harambee! Educational Policy, Inequality, and the Political Economy of Rural Community Self-Help in Kenya. *Journal of African Studies* 4:86–106.
- Kinyanjui K. 1981. Education and Inequality in Kenya: Some Research Experience and Issues.
- Leste A., Valentin J. Hoareau F. 2005. *The Sacmeq II Project in Seychelles: A study of the conditions of schooling and the quality of education*. Harare: Sacmeq.
- Lev B. 2001. *Intangibles: Management, measurement and reporting*. Washington D.C.: Brookings Institution Press.
- Lockheed M. and Hanushek, E. 1994. Concepts of educational efficiency and effectiveness. *Human Resources Development and Operations Policy Working Papers*.
- Michael Q. 2002. *Qualitative Research & Evaluation Methods*. Thousand Oaks, CA: Sage.
- Mwiria K. 1990. Kenya's Harambee Secondary School Movement: The Contradictions of Public
- Oakes, J. 1986. *Education Indicators. A guide for policymakers*. Center for Policy Research in Education. New Brunswick, NJ
- Orvis S. 1985. Men and Women in a Household Economy: Evidence from Kisii. IDS Working paper

- Pawson R., and Tilley N. 1997. *Realistic evaluation*. London: Sage.
- Pinnegar, S. and Daynes, J. 2006. *Locative narrative inquiry historically: Thematics in the turn to narrative*. In D. J. Clandinin (Ed.), *Handbook of narrative inquiry*. Thousand Oaks, CA: -sage.
- Republic of Kenya. 1965. *Education Commission Report Part Two*. Nairobi: Government Printer.
- . 1984. *Ministry of Education, Science and Technology Annual Report*. Nairobi: Government Printer.
- . 1986. *Urban Labour Force Survey*. Nairobi: Government Printer.
- . 1988. *The Report of the Presidential Working Party on Education and Manpower Training for the Next Decade and Beyond*. Nairobi: Government Printer.
- . 1989. *Children and Women in Kenya: A Situation Analysis*. Nairobi: Government of Kenya/UNICEF.
- . 1991a. *Statistical Abstract*. Nairobi: Government Printer.
- . 1991b. *Employment and Earnings in the Modern Sector*. Nairobi: Government Printer.
- . 1991c. *National Development Plan, 1994–1996*. Nairobi: Government Printer.
- . 1991d. *Rural Labor Force Survey*. Nairobi: Government Printer.
- . 1991e. *Development and Employment in Kenya: A Strategy for the Transformation of the Economy*. Nairobi: Government Printer.
- . 1991f. *Ministry of Education Annual Report*. Nairobi: Government Printer.
- . 1993. *Economic Survey*. Nairobi: Government Printer.
- . 1993. *Enhancing Women’s Participation in the Science-Based Curriculum: The Case of Kenya*.
- Romei P. 1991. *La qualità nella scuola*. McGraw Hill. Milano.
- Romei P. 1999. *Guarire dal mal di scuola*. La Nuova Italia. Firenze.
- Rothschild, David and Naomi. 1988. *The Precarious Balance: State and Society in Africa*. Boulder: Westview.
- Routledge. Hazlewood, Arthur, Jane, Albert, John, and Sabot. 1989. *Education, Work and Pay in East Africa*. New York: Oxford University Press.
- Scheerens J. and Hendricks M. 2004. *Benchmarking the Quality of Education*. *European Educational Research Journal*, 3(1), pp. 101-114.
- Shavelson R., McDonnell L., Oakes J., Carey N. and Picus L. 1987. *Indicator Systems for Monitoring Mathematics and Science Education*. The RAND Corporation. Santa Monica, CA.
- Stevenson, David L. and David P. 1992. *Shadow Education and Allocation in Formal Schooling*
- Stufflebeam D. Shinkfield A. 2007. *Evaluation, Theory, Model & Applications*. Jossey Bass. San Francisco

- Stufflebeam D. 1971. The relevance of the CIPP evaluation model for educational accountability. *Journal of Research and Development in Education*, 5(1), pp. 19-25.
- Thomas, Barbara P. 1985. *Politics, Participation, and Poverty: Development Through Self-Help in Kenya*. Thousand Oaks, CA:Sage.
- World Bank. 1989. Kenya: The Role of Women in Economic Development. Washington.
- Zamberia A. 1996. Self Help Secondary Education in Kenya. *International Journal of Comparative Sociology* 37:47–71.

WEBSITES

http://eacea.ec.europa.eu/education/eurydice/key_data_en.php.(checked January 2013)

http://www.invalsi.it/download/Rapporto_SNV_08_09.pdf (checked December 2012).

<http://www.oecd.org/education/database> (last checked December 2012).

http://www.invalsi.it/snv1011/documenti/Rapporto_SNV%20201011_e_Prova_nazionale_2011.pdf
(checked October 2012).

<http://www.institutodeevaluacion.mec.es/contenidos/indicadores/SEIE2006web.pdf> (checked
January 2013).

<http://www.institutodeevaluacion.mec.es/sistemandice> (Access date: February 2013)

<http://nces.ed.gov/programs/coe/> (Checked: November 2012).

<http://www.oecd.org/document> (Checked: January 2013).

<http://www.uis.unesco.org/TEMPLATE/pdf/isced/ISCEDA.pdf> (checked October 2012).

<http://www.fondazioneagnelli.it> (checked October 2012).

APPENDIX

Appendix 1: Variables tested in the two-level models for reading and mathematics

LEVEL 1 (PUPIL) VARIABLES

Pupil individual characteristics

Pupil age

Pupil sex

(0=boy; 1=girl)

Grade repetition

(0=never; 1=repeated once; 2=repeated twice; 3=repeated three times or more)

Days absent

Speaking language of instruction

(0=never, 1=sometimes; 2=most of the time; 3=all the time)

Personalized learning support

Preschool attendance

(0=never; 0.5=a few months; 1=one year; 2=two years; 3=three years or more)

Pupil learning materials

Sum of possession of at least one of each of eight important learning materials: an exercise book, a notebook, a pencil, a sharpener, an eraser, a ruler, a pen, and a file.

(0= no learning materials; 1=at least one; 8=at least one of each item)

Homework factor

(0=no homework given; 1=homework given some days but never corrected nor explained; . . . 9=homework given most days, and always corrected and explained)

Homework help at home

Two version of this variable were considered:

Version 1: (0=no homework/never; 1=sometimes; 2=most of the time).

Version 2: (0=no homework/never; 1=sometimes/most of the time).

Extra tuition

(0=no extra tuition in this subject; 1=extra tuition in this subject)

Working place factor

(0=has no sitting nor writing place; 1=has either sitting or writing place; 2=has both sitting and writing places)

Textbook ownership

(0=no textbook; 1=share with 2 or more pupils; 2=share with one pupil; 3=sole use)

Travel distance to school

Home environment

Socio-economic status factor

Rasch score involving items on home possessions, parental education, home quality, source of lighting at home, etc. (see Dolata, 2005)

Number of siblings

Number of brothers and sisters (plus step- and half- brothers and sisters) living with pupil at home.

Meals per week

Total number of meals (breakfast, lunch, and supper) taken by pupil a week.

Household tasks factor

Sum of the involvement of pupil in various household activities such as laundry, fetching water, collecting firewood, livestock duties.

Learning culture at home

Number of books at home

Parents alive

(0=no parent alive; 1=one parent alive; 2=both parents alive)

Living with parents/relatives

(0=living with non-relatives; 1=living with parents or relatives)

Appendix 1: Continued.

Teacher characteristics

Teacher sex

(0=male; 1=female)

Teacher age

Permanent teacher

(0=temporary teacher; 1=permanent teacher)

Teacher education level

(0=primary; 1=junior secondary; 2=senior secondary; 3=A-level; 4=university graduate)

Teacher years of professional training

(0=no training; 0.5=less than one year; 1=one year; 2=two years; 3=three years; 4=more than three years)

Teacher years of experience

Teaching hours per week

Teacher in-service training

Number of short in-service courses attended during the last three years

Teacher visits to education resource centre

(0=no educ. resource centre/not visited; 1=has visited educ. resource centre during this school year)

Teacher subject matter knowledge

Teacher score on a reading test (for the reading models).

Teacher score on a mathematics test (for the mathematics models).

Teacher frequency of meeting parents

(0=never; 1=once a year; 2=once a term; 3=once or more per month)

Teacher hours of preparation per week

Teacher housing condition

(0=poor state; 1=require major repairs; 2=requires minor repairs; 3=good condition)

Teacher trained to teach subject

(0=not trained to teach subject; 1=trained to teach subject)

Teacher days absent

Number of days absent during this school year.

Report on subject

(0=school report for each pupil has no specific section for comments on the subject;

1=school report for each pupil has a specific section for comment on the subject)

School head advice teacher

(0=never; 1=once a year; 2=once a term; 3=once or more a month)

Classroom environment

Class size

Number of pupils in the class.

Classroom resources factor

Sum of the existence of the following eight items in the classroom: writing board, chalk/marker, wall chart, cupboard, bookshelves, classroom library or book corner, teacher table, and teacher chair.

Parents sign homework

(0=parents not asked to sign homework; 1=parents asked to sign homework)

Frequency of tests

(0=no tests; 1=once a year; 2=once per term; 3=two or three times per term; 4= two or three times per month; 5=at least once per week)

Appendix 1: Continued**School head characteristics****School head sex**

(0=male; 1=female)

School head age**School head years of professional training**

(0=no training; 0.5=less than one year; 1=one year; 2=two years; 3=three years; 4=more than three years)

School head education level

(0=primary; 1=junior secondary; 2=senior secondary; 3=A-level; 4=university graduate)

School head years of experience as a head**School head years of teaching experience****School head management course**

(0=no training on school management; 1=has received training on school management)

School head teaching hours per week

School environment**Condition of school buildings**

(0=poor state; 1=require major repairs; 2=require minor repairs; 3=good condition)

School resources factor

Two versions of this variable were considered:

Version 1: Sum of the existence of 22 school resource items in the school including a school library,

school meeting hall, staff room, separate office for school head, sports area, water, electricity, telephone, fax machine, overhead projector, radio, TV set, photocopier, and computer.

Version 2: Rasch score involving school resources items (e.g. school library, staff room, water, electricity,

and computer) as well as classroom resource items such as teacher table, teacher chair, sitting places,

cupboard, and bookshelves (see Saito, 2005).

Borrowing books from school

(0=no library/not allowed to borrow books; 1=pupils allowed to borrow books)

Proportion of female teachers**School days lost**

Number of school days lost in the last school year because of factors beyond school head control

such as natural calamities, strikes, and social unrest.

School location

(0=isolated; 1=rural; 2=small town; large town or city)

School inspections

Two version of this variable were considered:

version 1: The number of times the school has been visited by a school inspector or quality assurance office during the last two school years.

version 2: The number of years since the school had a full inspection.

School community contribution factor

Sum of the presence of community contributions towards nine school activities including construction and maintenance of school buildings, construction and repair of school furniture, provision of school meals, buying of textbooks, stationery and supplies, payment of teacher salaries, and extra-curriculum activities.

School community problems

The extent to which lack of cooperation from community is a problem to the school. (0=no problem; 1=minor problem; 2=major problem).

Appendix 1: Continued

Pupils' behaviour problems factor

Sum of existence of behavioural problems among pupils (e.g. lateness, skipping classes, classroom disturbance, cheating, use of abusive language, theft, fighting, and vandalism)

Teachers' behaviour problems factor

Sum of existence of behavioural problems among teachers (e.g. lateness, absenteeism, skipping classes, use of abusive language, drug abuse, and alcohol abuse)

Pupil-teacher ratio

Pupil-toilet ratio

Private school

(0=government school; 1=private school)

Free school meals

(0=no free school meals; 1=one free school meal a day; 2=two or more free school meals a day)

School size

Total number of pupils in the schools' biggest shift.

School environment (aggregated variables)

Mean pupil age

Proportion of girls

Mean grade repetition

Mean days absent

Mean speaking language of instruction

Mean preschool attendance

Mean learning materials

Mean homework (given, corrected, and explained)

Mean homework help

Mean extra tuition

Mean working place

Mean textbook ownership

Mean travel distance to school

Mean socio-economic status

Mean number of siblings

Mean meals per week

Mean household tasks

Mean learning culture

Mean parents alive

Mean living with parents/relatives

Variable	Kenyan schools	Italian schools	notes
Pupil age: regular, early starters, late starters	Regular students perform better, early starters are average and late starters are poor performers	Both regular and early starters do well whereas late starters do poorly.	Age range 11-14 years
Pupil sex: male/female	No much difference in performance but boys tend to do better in mathematics and girls in reading	Boys do better in mathematics and girls do better in reading	Reading refers to the competency of Italian and English language
Socio-economic and culture status: home possessions, quality of home, parental occupation, parental level of education	Pupils from rich families performed better due to availability of learning materials and personalized learning support.	Performance varied with the level of education of the parents, the higher the level the better the performance, the lower the level the poor the performance	In Italy there is no much difference in performance between rich families and poor family at a provincial level but varies when a countrywide situation is considered.
Preschool attendance: never, 1 year, 2 years, 3 years and more	Pupils who attended preschool did better	There was no much difference because almost all the pupils had attended preschool.	In Kenya preschool attendance is not of great importance especially in rural areas due to lack of resources.
Extra tuition: homework help at home, pre/post school	Pupils who had a homework help at home did better.	Pupils who attended pre/post school homework centres did better.	Extra tuition is very common in Kenyan schools among rich families.
Grade repetition: twice, more than three	When applied once the pupils perform a little bit better but usually it does not have positive results on performance	Little positive impact on the performance. The more the pupils repeat grades the worse the performance	In Italy grade repetition is a common practice for the foreign students due to language barrier.
Speaking language of instruction at home:	The more the pupils speak the language of	Lack of use of instruction language at home among	Non native pupils have a

never, sometimes, most of the time, all the time.	instruction the better the performance because Kenya is a trilingual state	non native pupils has a negative impact on reading resulting to low performance.	tendency of using Italian language at school and the language of the origin country at home.
House hold tasks: Laundry, fetching water, collecting firewood, livestock duties, looking after the young brothers and sisters	Pupils who do not need to perform household tasks perform better because they have more time to study.	There is no impact on native pupils but has a negative impact on non native pupil.	In rural schools pupil are usually assigned duties to perform after school. In Italy pupils from non native families have to help in house hold tasks because most of their parents work throughout the day.
Pupils origin: native, non native 1 st generation, native 2 nd generation	There is no difference in performance due to low numbers of immigrants	The native pupils including the 2 nd generation perform better in Italian whereas among the non native pupils of the 1 st . generation the performance is below average.	In mathematics the difference in performance for the three categories does not vary much.

Table 1: Pupil level variables

Variable	Kenyan schools	Italian schools	notes
School resources: writing board, chalk/marker, cupboard, bookshelves, class/school library, computer laboratories, staff quarters, school hall, sports area/gym	Pupils performed better where there were more resources.	The more the resources the better the performance	In Kenya rural schools tend to have fewer resources.
School location: urban, rural	Pupils from urban schools especially in the outskirts perform better. The poorest performance is among the pupils from rural schools located in remote areas.	There is no much difference in performance between pupils from urban and rural schools	The urban schools were classified as those in the town centre and those in the outskirts. Whereas the rural ones were categorized in accessible and remote areas.
Teacher characteristics: male/female, age, qualification, experience, permanent/temporary, days absent	Female teachers of average age (30 years) and with professional training have a positive impact on the performance of pupils.	There is no difference between male and female teachers, it depends on individual characteristics. Whereas a permanent teacher has a positive impact on the performance compared to a temporary one who changes school every year.	In both schools the female teachers outnumber the male teachers.
Class size: pupil teacher ratio	A smaller class is easy to manage resulting to better performance.	The smaller the class the better the performance.	The number varied from 20 to 60 pupils. In Kenya most of the classes are in access due to lack of enough schools.
School environment: condition of school building, safety, pupil/teacher behaviour problems, gender disparity	A decent, safe and pupil friendly school has a positive effect on the performance.	A safe and calm environment has a positive impact on the performance.	In both schools episodes of bullying are common in the schools.
Head teacher characteristics: Male/female, age, qualification, experience, years of professional training	A female head teacher with experience and professional training in management has a positive impact in the performance.	There is no much difference between a male and female head teacher, it depends on individual approach and experience.	In both schools there are more female head teachers than male teachers.

Table 2: School level variable

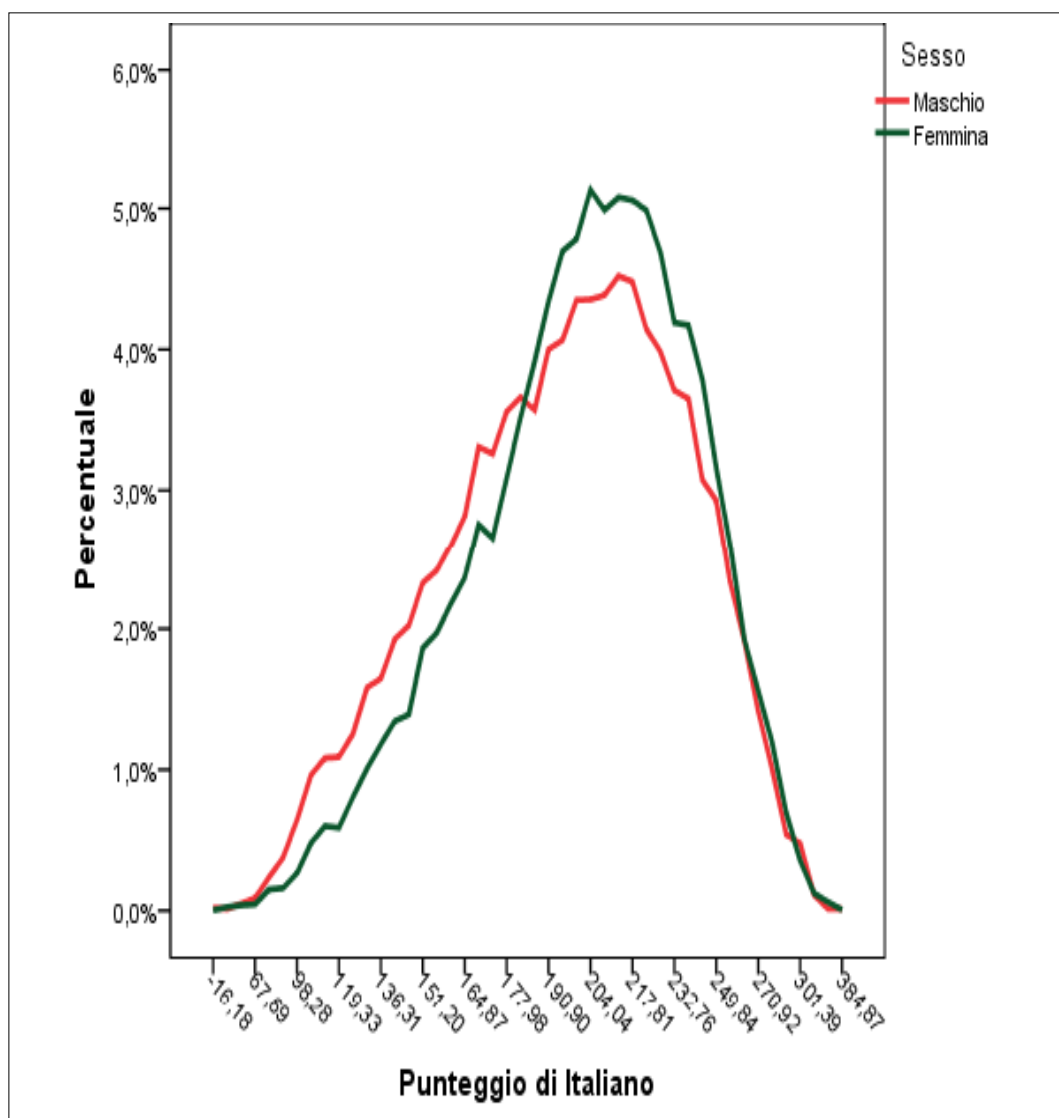


Figure 6: Differences in Italian scores for both girls and boys

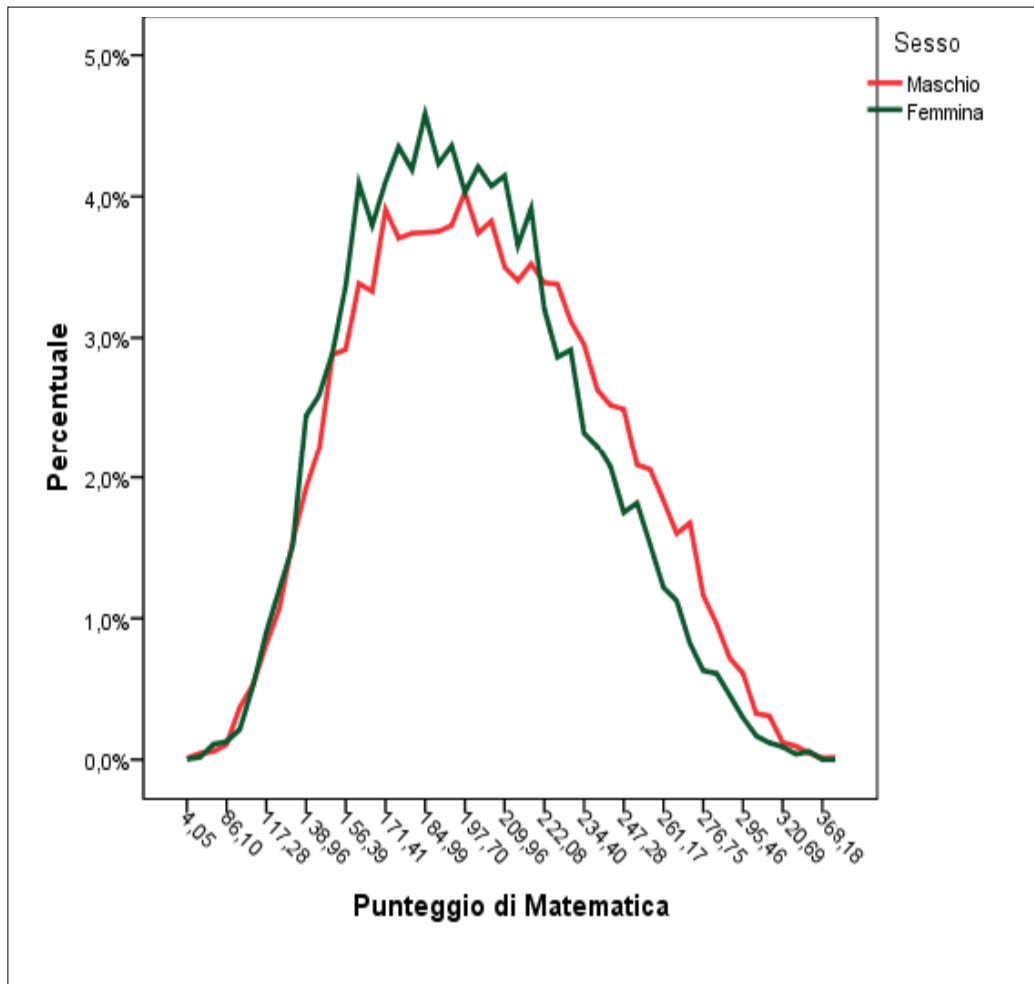


Figure 7: Differences in mathematics scores for both girls and boys

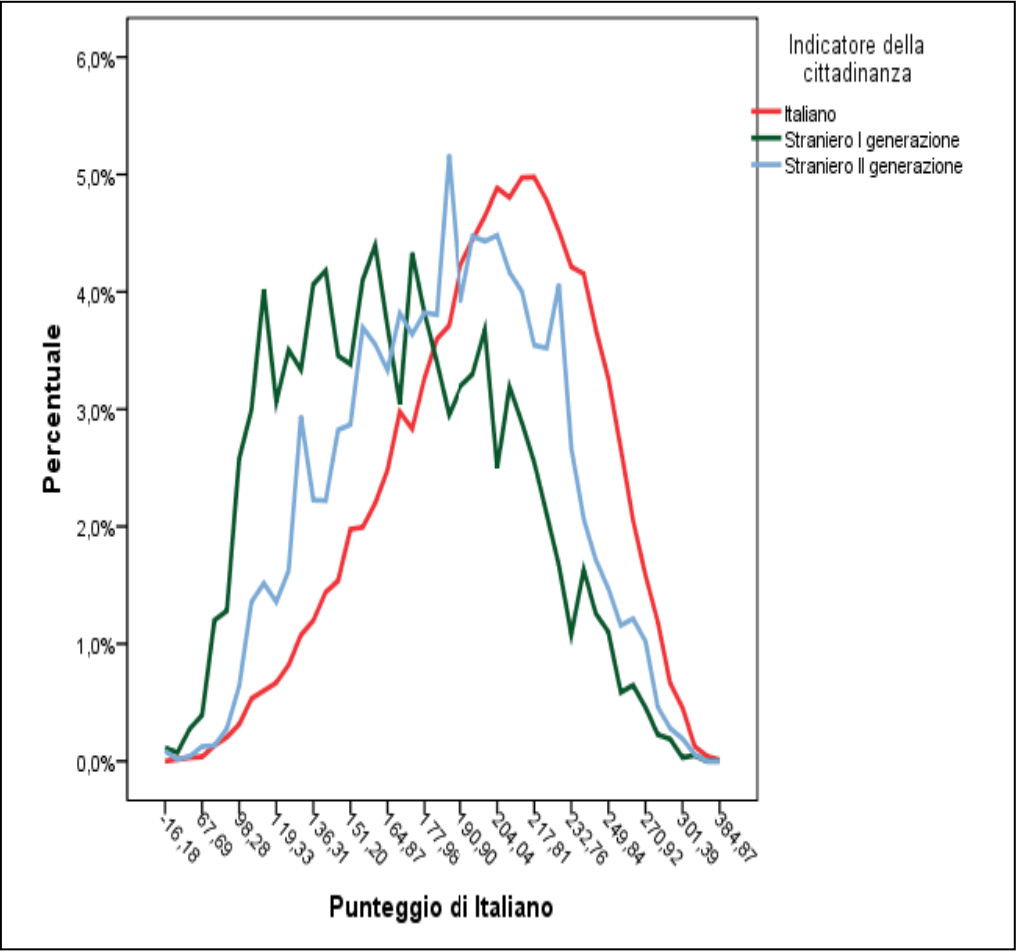


Figure 8: Italian scores for native and non native students

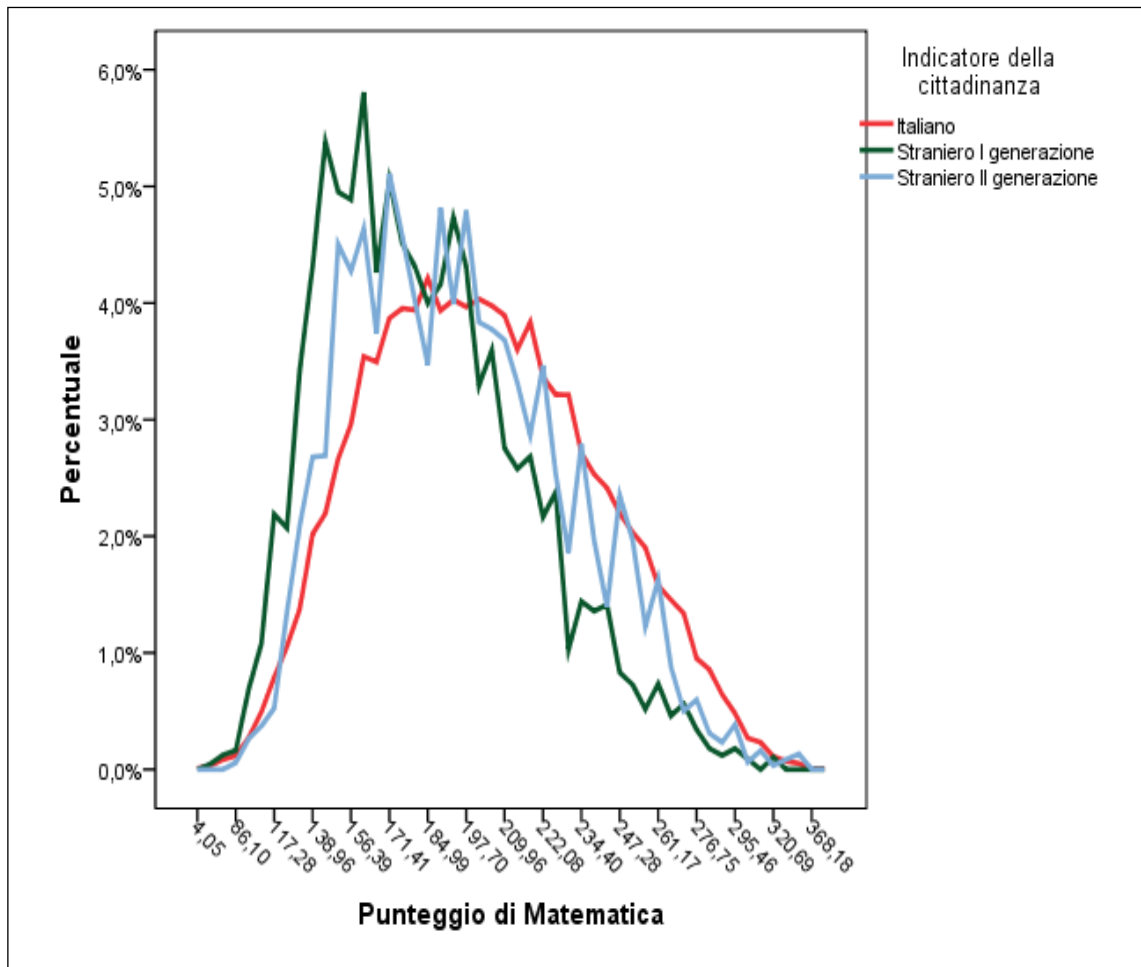


Figure 9: Mathematics scores for native and non native students.

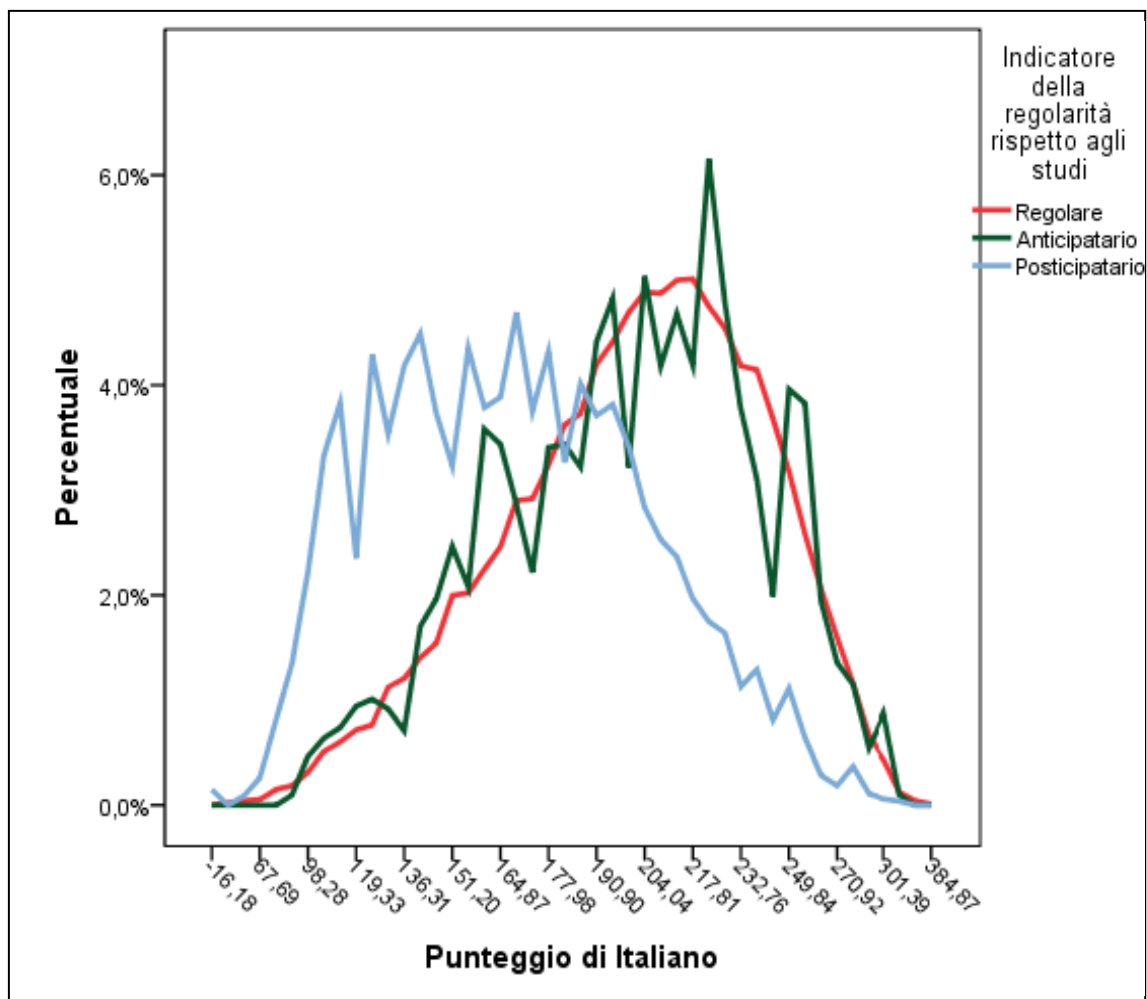


Figure 10: Italian scores for regular and non regular students

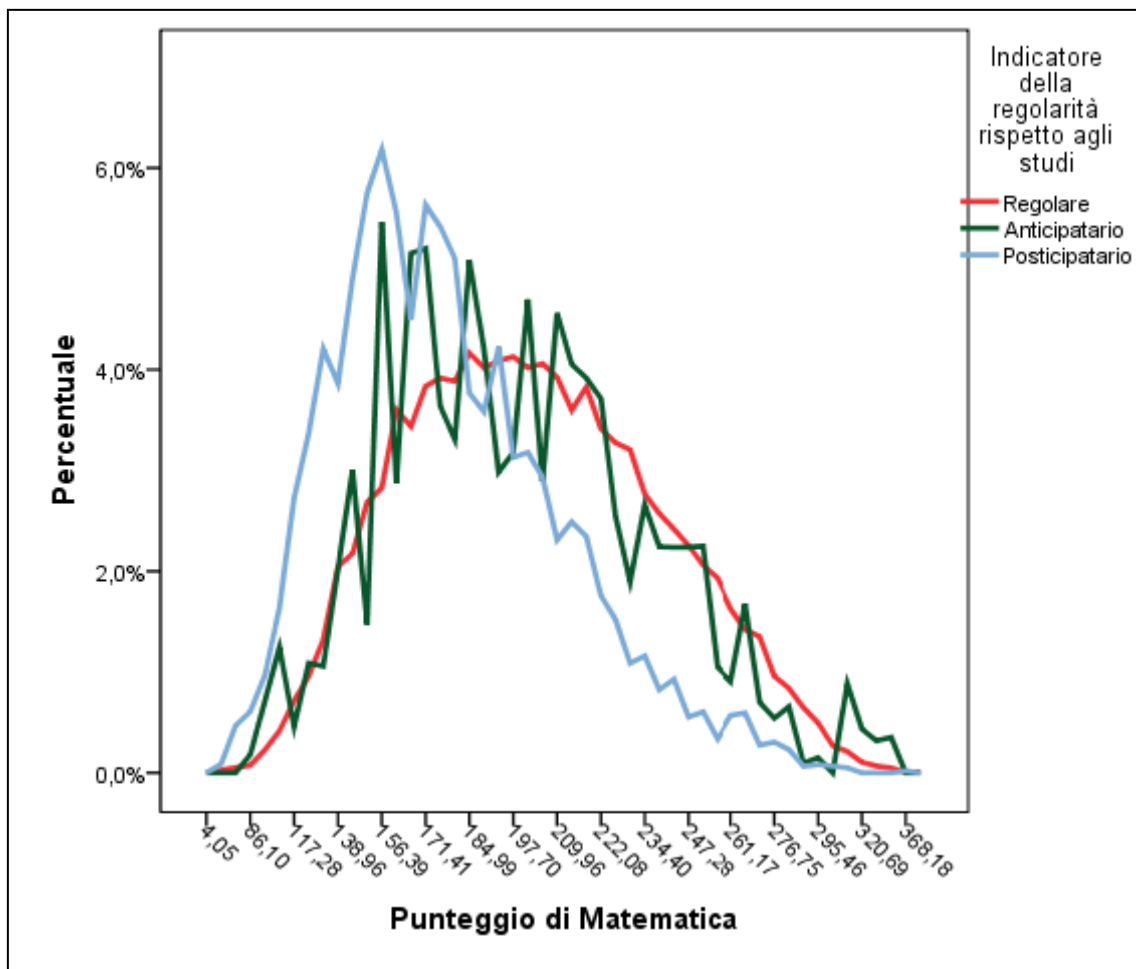


Figure 11: Mathematics scores for regular and non regular students