

Increasing Teacher Attendance: Peruvian Incentive Project in Rural Schools

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SUMMARY

This research focuses on the evaluation of the second year (2004) of the pilot project “rural teacher attendance incentive plan” developed by the Secretary of Strategic Planning of the Ministry of Education of Perú and co-financed by the World Bank. This project aims to increase the attendance of rural teachers in five poor departments of Perú: Ayacucho, Cusco, Piura, Puno and San Martín. This pilot project was implemented because many studies found that the attendance of teachers in poor areas is very low due to the geographic isolation, the weather, and the distance from larger communities and family.

To do so, the project carried out an individual and institutional incentive plan with the collaboration of parents from the community that monitored the attendance of teachers. Teachers who had an attendance rate of 90% in the first semester and 95% in the second semester receive a bonus; additionally, schools of which 80% of its teachers reached the goal receive an award.

This study applies a quasi-experimental design with a comparison and a treatment group. The main objective of this research is to demonstrate if the checking system done by parent-monitors is reliable and if the incentive plan is increasing the attendance of teachers in rural schools. Additionally, the study includes recommendations for the 2006 implementation.

The main results of the study showed the checking system done by parent-monitors as a first successful experience in giving the parents the responsibility of gathering the data needed to implement a teacher incentive plan. In addition, this is an innovative experience of a monitoring system in a decentralized way which works with members of the community in rural areas.

Another find of the study is that the attendance of teachers was high in the schools where parent-monitors visited the teachers. It could be presumed that teachers tended to attend more in the schools where parent-monitors visited teachers since parents, as representative of the community, were closely supervising and observing their work.

The last main results are focused on the achievement of the individual and group award. It can be assumed that the merit pay and school-based award plan were having a positive impact on the attendance of the teachers. The amount of the monetary bonus (between 5 and 10% of the average salary of a teacher) was perceived as a sufficient motivator for teachers to change their attendance behaviour although it is not a big increment of their basic salary.

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1 INTRODUCTION

There is widespread interest in both developed and developing countries in improving the efficiency and effectiveness of the education system. It is well known that teachers are very important actors for improving school quality and many policies are focused on recruiting and retaining better teachers, enhance teacher morale and performance, as well as raising the quality of teacher work-life and salaries.

Additionally to these concerns, many developing countries have to deal with the high rate of absenteeism within teachers in public schools and schools in rural and remote areas. As Glewwe, Neuman & Kremer (2003) stated, absence rates among primary-school teachers in developing countries are high such as 26% in Uganda, 23% in India, 16% in Ecuador and 13% in Perú. In most cases the low attendance of teachers in poor areas is a consequence of the geographic isolation of schools, the difficult weather, and the distance of teachers from large cities and family. All these conditions require specific and innovative policies in order to increase the quality of education in these challenging areas.

In order to solve these major problems, some developing countries in Latin America and Africa have been raised to the idea of introducing market-like incentive into the educational sector, bringing to bear the powerful forces of competition and the price system in order to enhance school performance and change teacher behavior.

In this line of action, in 2003 the Ministry of Education of Perú launched a pilot project called “rural teacher attendance incentive plan” in order to increase the attendance of rural teachers in five poor departments of Perú: Ayacucho, Cusco, Piura, Puno and San Martín. The methodology used included an individual and institutional plan with the collaboration of parents from the community who monitored the attendance of teachers. Teachers who had an attendance rate of 90% in the first semester and 95% in the second semester receive a monetary bonus; additionally, schools of which 80% of its teachers reached the goal receive an award.

This research seeks to derive empirical evidence on the effectiveness of the second year (2004) of the pilot project “rural teacher attendance incentive plan” and to demonstrate if the checking system done by parent-monitors is reliable and if the incentive plan is increasing the attendance of teachers in rural schools.

This paper is organized as follows: It starts with a description of the educational system in Perú including the policies related with teachers in the public sector. The third section gives a brief description of the incentive plan and the conditions of the rural areas where the project has been implemented. The following chapter describes the research design and some specifications about the research questions, the evaluation design and methodology used in this research. The fifth chapter starts with an explanation of the motivational theories related with incentives and a description and categorization of the incentives systems. Further sections of this chapter focus on the most relevant studies carried out in some developing countries in Middle East, Africa and Latin America. The last two chapters describe the empirical results of the study divided in three parts according to the research

questions and the most relevant conclusion of the study. Finally, the document describes some recommendations for further implementation.

2 DESCRIPTION OF THE CONTEXT

Before beginning with the literature review, it is necessary to make a general review of the Peruvian educational system and some legislation related with teachers and school policy.

2.1 Peruvian Educational System

The educational system in Perú is structured in two stages: basic education and tertiary education. The population in Perú in basic education, between 0 and 16 years old, consist of around 10,150,250 students (73% of the population between these ages) of which 66% is located in urban areas and 34% in rural regions (Vexler, I. 2005). The majority of public schools are considered rural (57.5%) and 42.4% of schools are located in urban areas. Around three quarters of the rural schools are primary (73.5%) followed by kindergarten schools (17.2%) and only a few secondary schools which are usually located in the capital of the province¹ (Montero, 2001).

The basic education in Perú is a right so it is free, but only in public schools (73%² of all schools in Perú). There are three kinds of public schools categorized according to the number of teachers and the number of grades that each teacher is in charge of. The first category is “polidocente completo” schools (8.3%) which are institutions with at least one teacher per grade in different classrooms. Secondly, more than half (54.6%) of the schools are “polidocente multigrado” which are schools with some classrooms where a teacher has to teach pupils from different grades and ages. Finally, more than one third of public schools (37.1%) are “unidocente” or the so called single-teacher schools, where there is only one teacher for all grades and he/she also works as a headmaster. The last two kinds of institutions are mostly primary schools and they are very common in rural areas.

Basic education is divided in three compulsory levels: kindergarten (6 years taught, to children from 0 to 5 years old), primary education (6 years, to students from around 6 to 12 years old) and secondary education (5 years, to students from around 13 to 17 years old). In addition, kindergarten and primary education is complemented with health and food programmes, and free educational materials are provided for all students.

According to the last educational legislation (2003) the time that students spend in the classroom per year varies according to the level of education. For instance students study at school 1200 hours for secondary education, 1100 for primary education and 900 hours for kindergarten education. Since teachers are not attending the time they should; in the last few years, teachers of the public sector in the National Agreement signed in 2004, compromised to fulfil a minimum of 1000 hours for secondary and primary education which includes longer teaching sessions per day, even though this time is below the one stipulated in the law.

The initial level of the basic education is kindergarten which is compulsory since 2003 with the new educational law. Before this year, children under 6 years old could attend a kindergarten school (public or private), a “wawa wasi” (a public day care centre led by trained mothers from the community), or neither of them; before they went to primary school. As the vice minister of education

¹ Due to a lack of updated information, some cities and capitals of provinces are still considered rural areas even though their population and services have increased in the last few years.

² According to ESCALE 2003 (office of The Ministry of Education dedicated to statistics about education) <http://escale.minedu.gob.pe/portal/index.jsp?cat=1&subcat=7&modulo=esbas&archivo=cifras>

Idel Vexler Talledo remarked in the national report for the IBE-UNESCO, nowadays the educational system only covers 3% of the population between 0 to 2 years old and 57% of the population between 3 and 5 years old. In addition, kindergarten education is organized in two stages: The first one covers children from 0 to 2 years old where no schooling is given and the second attends to children from 3 to 5 years old with schooling.

The second level of the basic education is primary education. The National Office of Kindergarten and Primary Education (DINEIP) is in charge of this level which is organized in three cycles (stages): first cycle (first and second grade), second cycle (third and fourth grade) and third cycle (fifth and sixth grade). Each cycle has its own competencies and capacities to be reached by children in two years of study. For this reason, pupils can only be failed at the end of each cycle, and the promotion within each cycle (between for instance, first and second grade) is automatic.

Secondary education is the last stage of the basic education and is led by the National Office of Secondary Education and Technical Studies (DINESST). It covers less than 44.7% of the population between 12 and 16 years old in rural areas and 98% in urban areas (Vexler, 2005). The DINESST have launched a new program called “Nueva Secundaria” (New secondary) which includes an Educational Curriculum for secondary education implemented on January 2004. It is organized in two cycles (stages): first cycle (first and second grades) and the second cycle (third, fourth and fifth grades). The first stage gives the student general training and its main objective is to consolidate the knowledge and skills attained in the previous stages. Furthermore, the aim of the second stage is to give students the necessary knowledge and skills to succeed in the tertiary education and in the labour market.

Teachers base their classes, school activities and projects on a national curriculum provided by the Ministry of Education. This document is a general framework of competencies and capacities to be taught and contains methodology guidelines specific to each area. However, due to the diversity of cultures and languages, teachers can adapt the national curriculum according to the reality of the school and the needs of the community and the students. Additionally, given the fact that there is not a national broad evaluation for students to determine who passes or who fails, each teacher has to design his/her own evaluation system taking into consideration the competencies and capacities established in the national curriculum. The only national evaluation is organized by the Quality Measurement Unit of the Ministry of Education in order to compare the performance of the Peruvian student to international standards. The areas evaluated by this office are: Mathematics and Communication (reading comprehension) for secondary and primary education and, additionally, the areas of Social Science and Natural Sciences only for primary education and assess only students who are finishing each cycle of primary and secondary education.

Finally, it is important to remark that due to the diversity of national languages³, the Ministry of Education created the National Office of Intercultural Bilingual Education (DINEBI) which works together with all levels of the basic education but it focuses on rural schools where students speak other language than Spanish. The principal activities of this office are elaborating educational materials in

³ Achuar, Aguaruna, Aymara, Amahuaca, Ashaninka, Bora, Arabela, Cacataibo, Candoshi, Capanahua, Cashibo-Cacataibo, Cashinahua, Chamicuro, Chayahuita, Cocama Cocamilla, Culina, Ese Eja, Huitoto, Harakmbut, Iñapari, Jacaru, Jebero, Machiguenga, Mayoruna, Nomatsiguenga, Ocaña, Orejón, Orejón, Quechua, Resígaro, Secoya, Shipibo-Conibo, Taushiro, Ticuna, Urarina, Yagua, Yaminahua (Yora) Yanesha and Yine, including Spanish are the official languages recognized in the Peruvian constitution.

different languages (books, workbooks, etc.) and also training teachers in bilingual education in order to revalue the native languages and the cultural practices.

2.2 Administrative Organization of the Ministry of Education

In contrast with other Latin American countries and the United States (Peruvian Educational at a cross road, 2001; Mizala & Romaguera, 2004), the public education system in Perú is fairly centralized, and most if not all allocation decisions are made by a central authority, the Ministry of Education in Lima. Likewise, the teacher union, “Sindicato Unico de Trabajadores de la Educación del Perú” (SUTEP) is a consolidated and centralized body that seeks to influence both general policies as well as sector decisions.

The administrative organization of the education of Perú includes the following organs and institutions:

The Ministry of Education is the organ of the government in charge of defining the educational, cultural, recreational and sports policies according to the general guidelines of the state in and coordination with the regional authorities.

On a regional level, the Regional Office of Education is a specialized organ of the Regional Government and has a technical and normative relationship with the Ministry of Education. It is in charge of the educational service in its territory and coordinates with the Units of Local Educative Management of its jurisdiction.

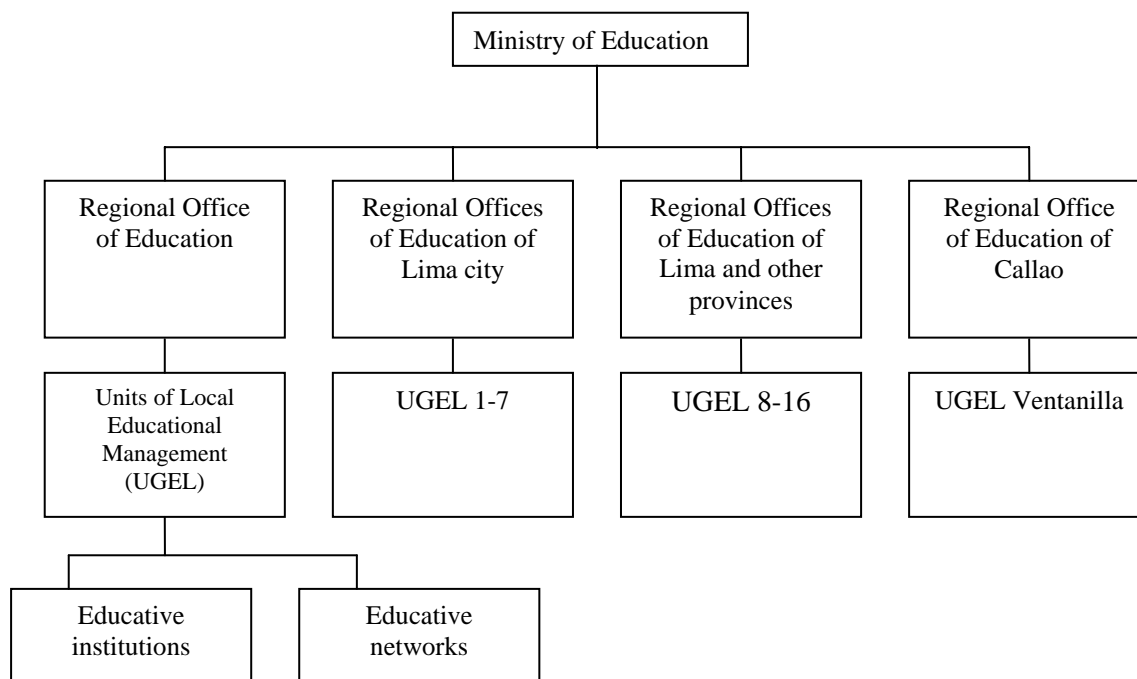
On the province level there is the Unit of Local Educative Management (UGEL) which is a decentralized execution unit of the Regional Government with autonomy in its jurisdiction. It is in charge of the educational and administrative affairs of the educational institutions (schools, universities, clubs, etc.) within its territory⁴.

Furthermore, the Educative Network is an institution of mutual cooperation, interchange and assistance between schools. It is organized by a group of schools that has territorial or cultural affinity around a headquarter school that is provided by the government with special equipment and economic support. The main objective of this organization is to increase the quality of the teachers and promote academic network training. It also tries to optimize the human resources, infrastructure and educative materials of schools.

In addition to these administrative organizations, there are some other institutions organized by each school. One of these associations is the Institutional Educative Council (CEI) created in 2001. It is an institution of participation, agreement and monitoring organized and led by the citizens of the community. It is headed by the principal of the school and its other members are: vice principal, representatives of teachers (2 members), parents (2 members), students (2 members) and leaders of the community.

⁴ The jurisdiction of an UGEL is not restricted to a province; it can be modified according to the dynamic of the society, geographic, cultural or economic affinity, or to the accessibility.

Graph 1 below explains broadly the administrative organization of the Ministry of Education.



Graph 1: Administrative organization of the Ministry of Education

2.3 Teacher Legislation

As is stated in the new Law of Education 28044 (2003), to become a public teacher the candidate has to participate in a national competitive examination (Concurso Unico) which basically measures subject and general knowledge. The maintenance and promotion of teachers depend on the results of an evaluation system which takes into account the quality of the performance, merits and awards, and years of experience in the field.

According to an inquiry taken by the International Institute for Educational Planning (IIEP), from the UNESCO (2001) teachers seem to agree with the innovations stated in the New Educational Law. Teachers considered that the salary policy should be based on the periodical evaluation of the quality of the performance and study diplomas, and not only based on working years which is the traditional approach. Although teachers agree to be evaluated, 76% of teachers claimed that the actual mechanism of evaluation is deficient and that the evaluation should be led by the head of the school and by experts from the Ministry of Education. (El Comercio February 27th, 2005)

After the last teacher law (24029) in 1984, it was stated that only those people with a teacher title can be hired in the public sector, closing this option for other professionals. The new Law of Education (2003) added that for the basic education it is indispensable for a teacher to have a pedagogic degree. There are two ways to obtain this pedagogical degree: studying 5 years in a university or in a public pedagogic institute. These two ways are equivalent in terms of the teacher position and for the job promotion in the public sector.

Concerning teacher labour relations, teachers are classified either as contracted or as a tenured permanent staff member that are appointed to authorize pensionable position and occupies a formal

position in the public cadre of personnel, or CAP. Unlikely tenure servants, contracted teachers that are around 25% of total teachers, are not eligible for pensions and can be dismissed without severance pay. Apparently, this option was used to avoid increasing pressure for social benefits among teachers while accommodating the demand for an increasing number of teachers. In recent years, contracted teachers have been more likely to be assigned to less favourably located schools in rural areas where unionization is greater (49%) and powerful. (Peruvian education at a crossroad: Challenges and opportunities, 2001).

The career path and scaled salary for teacher promotion are organized in 5 levels (I-V) for teachers with a title and (A-E) for teachers without a pedagogical degree, with a minimal of 5 year to be in each before reaching a higher one (modification of the teacher law, 1990). The promotion to the second level is automatic after 5 years, but for the next three levels an evaluation is needed after accomplishing the minimal time required (article 43). The evaluation for promotion is based on education units, university degrees, and years of experience. However, promotion between scales has been frozen since 1991. Consequently, the majority of teachers is at the level A and B, and do not have strong motivation for better performance, professional development, and promotion. (Peruvian Education at a Crossroad: Challenges and opportunities. 2001)

Teachers are paid according to a single salary schedule that provides pay increases and promotions almost exclusively based on seniority (years of experience) and evidence of education and training certificates (number of college/university units and degrees). Nevertheless, salary structure does not contemplate an extra payment for additional jobs such as coaching or other co-curricular activities and there is only 17.7% difference in payment between the top grade for 40 hours of work and the lowest grade for the same amount of work (Alcazar & Pollarolo, 2001). Besides the 12 month salary (S/. 800.00⁵ soles in average), the basic salary is adjusted for marital status, three fixed bonuses of 300 soles in March, July and December, and rural allowance. Rural allowance, however, is portable; that is, even after teachers leave the rural position and teach in the city, they will still be able to keep the monthly rural allowance. Furthermore, tenure teachers also receive two additional salaries for 20 years of service in the case of women and 25 years of service for men; and three extra salaries for 25 years of service for women and 30 in the case of men.

Although teacher salaries have had a small rise during the nineties and in 2004, they are still very low. It is calculated that in August 1999 the purchasing power of a teacher was equivalent to 51.3% of its purchasing power of 1942. The annual salaries are also low, 1.5-1.6 times the GDP per capita, which is 2 to 4 times lower than in other countries at a similar level of development (Psacharopoulos; Valenzuela & Arends, 1996; Liang, 2000; Peruvian Education at a Crossroad: Challenges and opportunities, 2001).

Although there is consensus about the necessity of increasing the salaries of teachers, due to the great number of educational and fiscal restrictions, making a significant increase in the salary of all teachers is almost impossible with the current country treasury. Nevertheless, for most educational experts (Murnane & Cohen, 1986; Milanowski, 2003; Cueto & Alcazar, 2004) the main problem is not the low salaries, but the non-existence of differences in salaries by levels of performance that award the quality and professional training of teachers. For instance, the salary difference between a teacher

⁵ Around €195 per month.

with five or less years of experience and one with twenty five years is only S/.60 soles (around €15.00).

Even though teacher salaries are very low, public teachers have more privileges in comparison to other public servants and private teachers. Teachers in the public sector who are tenured have job security (in the position, level, place and work place) and social security benefits (life insurance and free medical attention) for him/her and his /her family (also after retirement). Additionally, they have 70 days of paid holiday at the end of the year (unlike regular public servant and principals of the school that only have 30 days), plus 15 days in the middle of the year, and a free day for his birthday and other occasions. Other benefits are discounts in some public services such as transportation, cultural activities and shows, public hotels, etc; and subsidized housing (Derrama Magisterial and “Proyecto Especial de Vivienda Magisterial”).

2.4 Process to reevaluate teacher works

In the framework of the pact with teachers called “Pacto Reciproco con el Magisterio” signed in 2004 as part of the National Agreement (2002) in charge of the National Council of Education, the Government tries to solve the critical economic situation of the public teachers considering them an important aspect for increasing the quality of the education in Perú⁶. The government has compromised to increase the salary of the teachers according to the tributary collection, the on-time contract of teachers and the punctual pay of the salaries. The Pact also claimed to substantially increase the incomes of the teachers through general rises no less than S/.100 soles (around €25.00) until the year 2006 and setting up an incentive fund to reward effort and good performance. As the minister of education explained, even though the increment of the salary for teachers is, in general, homogenous for all teachers, it will be a plus for those teachers that work in difficult conditions such as in “unidocente” schools or “polidocentes” schools located in remote areas. (El Comercio, March 17th 2005).

After three successive raises of S/.50.00 soles in 2001⁷, S/.100.00 soles in 2003 and S/.115.00 soles in 2004 (El Comercio, April 25th, 2004); teachers have seen their salary level increased by around €70.00. The teachers in the lower level of the career structure (level V) received in August 2004 a salary of 41% more than the salary in 2001 (excluding taxes). Additionally, teachers from the highest level (level I) had an increase of 30% in their salary. Due to it being a homogeneous increase, teachers from the lowest level in the career structure have been receiving more benefits than the more experienced ones.

⁶ Pacto Social de compromisos recíprocos por la educación 2004-2006 (2004). Foro del Acuerdo Nacional.

⁷ At that time, the average salary of a teacher was 650.00 soles, approximately: €160.

3 DESCRIPTION OF THE PROJECT

The pilot project “rural teacher attendance incentive plan” started on September 2003 with the Ministerial law RM 0731-2003-ED, under the direction of the Secretary of Strategic Planning⁸ and is financed by the World Bank in the framework that the Ministry of Education has with the Programmatic Loan for Social Reform III (PLSR III). The next stage of the project, year 2004, was done under the framework of the PLSR IV.

3.1 Objective

The incentives program attempts to recognize the work of teachers in a different way than the traditional payment system where difference in payments depends on years of experience and number of college/university units and degrees. Additionally, the project wanted to recruit and retain better teachers to rural areas not only with a rural allowance which had demonstrated its inefficiency in attracting competent professionals in hardship areas (Delannoy & Sedlacek, 2001; Mizala & Romaguera, 2004); but taking in consideration their performance assessed by measuring behaviour such as attendance.

In this context, the short term goal of the incentive plan is increasing the time that teachers spend with their pupils, in pursuit of the long-term goal of improving the student performance and the quality of the education in rural schools. The cornerstone of the pilot project is the Institutional Educative Council (IEC) which is managed by the parents, teachers and principals of schools in order to monitor the attendance of teachers. Due to this reason, a secondary objective of the project is reinforcing the IEC as a new educative organization and the self-management of school, and parents and community participation and monitoring systems. Finally, another objective of the pilot project, as a research, is evaluating the effectiveness of the methodology used to give incentives in order to improve rural teacher achievement by increasing the time he/she spends with his/her students.

3.2 Procedure

The procedure of checking the attendance of the teachers is done by parent-monitors who are volunteers (no pay) and are chosen by the Institutional Educative Council (IEC) by consensus (ideally, one per day of classes and a coordinator have to be elected). Most of the time, they belong to the parent association of the school (APAFA) and only in a few cases to the IEC due to the fact that it is a new organization, created in 2001 but fully implemented in 2003. The parent-monitors are usually males who are trained to fill a register (F4) with a check, three times a day, to verify if the teacher is working with his/her pupils doing an educational activity (inside or outside the classroom). The first check has to be done in the first 10 minutes after the classes begin. The second check has to be done randomly, at a different time every day so teachers will not be aware of it. Finally, the last check has to be done in the last 10 minutes before the classes end. The registers were collected by the staff of the

⁸ The Secretary of Strategic Planning is in charge of conducting, coordinating, and proposing actions related to planning and evaluation of the management of the Ministry of Education in the issues related to planning systems, budget, information and documentation.

pilot project three times a year (in May, July and November). In each visit, new parent-monitors could be elected and trained, and new empty forms were given.

In addition to the teacher attendance register (F4), there are three other forms that have to be filled in advance for administrative purposes and in order to help the parent-monitors with their job. The three other forms are: School calendar and schedule (F1), School teachers list (F3) and parent-monitors list (F5). All the registers have four copies; one for the head of the school, one for the coordinator of parent-monitors, one for the Regional Educational Office and the last one for the Ministry of Education in order to assure that nobody could change any data after parent-monitors fill the register to benefit a particular teacher.

The pilot project used a combination of a merit-pay program and a school-based incentive plan. In the individual merit-pay program, a teacher could receive a monetary bonus if he/she was working with his/her pupils in the school 90%⁹ of school class-days, excluding national and regional holidays. For the school-based incentive plan, the group award was given to the head of school (only for those who don't teach), if 80% of the teachers of his/her school (only for schools with two or more teachers) reach the individual goal (90% of class-days).

The individual incentive included a monetary bonus and the amount of the bonus increased in proportion to the distance of the school from the capital of the province, as is shown in Table 1.

Table 1: Monetary incentive with respect to the distance of the school from the capital of the province

Distance from the capital of the province (grade of ruralness) using the most common means of transportation	Monthly monetary incentives per teacher (in soles)
Less than 2 hours	S/. 40 (5% of the average salary of a teacher)
Between 2 and 5 hours	S/. 60 (8% of the average salary of a teacher)
More than 5 hours	S/. 80 (10 % of the average salary of a teacher)

Additionally to this individual and institutional bonus, as a part of the school-based incentive plan in 2003, a school could receive a non-monetary reward that included books, educative games, sport equipment and educative materials per student of the school; if 80% of the teachers of the school (only for school with two or more teachers) reached the goal (90% of class-days). However, this type of reward in tangible material was not implemented in 2004 for reasons of being too costly.

The pilot project started working with seven poor provinces in Perú, divided in two groups: The treatment group: Suyos and Frias in Ayabaca department of Piura; El Dorado department of San Martin; Canas department of Cusco; and San Antonio de Putina in the department of Puno. Te comparison Group: Vilcashuaman in the department of Ayacucho and San Marcos in Cajamarca. However, at the end of the year due to problems with the teacher union, teachers from Cajamarca refused to participate in the project and they were eliminated from the sample, pushing the project to work with only one province as a comparison group. Both groups, the comparison and treatment groups differed from each other in the possibility of receiving the monetary award or not and in the

⁹ It is necessary to remember that the percentage of attendance for receiving the reward varies during the project.

information they received about the objective of the project. The difference between the treatment and comparison groups will be explained with more details in section 4.3 of the following chapter.

In 2003, the measure of the attendance was done in the last week of September, October and November. The monetary bonus was given in December and the group incentives not until July 2004 due to administrative and financial problems.

In 2004, the pilot project continued with the incentive plan described above, but replaced the non-monetary reward for a diploma of recognition for the schools that had reached the institutional goal. Since 2004, the goal was not measured by days of attendance, but by hours (number of checks, 3 per day) according to the following criteria: to obtain the incentives, teachers have to reach 90% of the checks (219 checks for a full-time teacher) for the first semester and 95% (213 checks for a full-time teacher) for the second. The first semester includes 85 days of classes beginning on March 15th until July 23rd, and the second semester consists of 75 days beginning on August 9th until November 30th. In the case of the principal of the school (only for those who don't teach), to obtain the incentives, 80% of the teachers of the school (only for schools with two or more teachers) have to reach the goal in each semester. The decision of increasing the goal was decided when the classes already started (May 2004), so in order to be fair to the teachers the new goal was only implemented in the second period of the year.

The payment of the monetary bonus for the teachers who have reached the target was done in two parts: The first one was done in August and the second at the beginning of 2005, taking in consideration the criteria of ruralness used in 2003 (see Table 1).

3.3 Characteristics of rural areas

In addition to the general information about the project, it is important to have a clear idea of the context and characteristic of the areas in which the project has been implemented.

Rural regions¹⁰ in Perú such as the provinces where the project was working above can be characterized as poor and disperse areas with a variety of cultural, ethnical and language backgrounds (Spanish, different varieties of Quechua and Aymara). The rural population is located in towns, villages and “caserios” with less than 500 habitants whose main economic activities are agriculture and cattle-breeding of sheep and cows, and “auquenidos” (llamas and alpacas) in the highlands and fishing in the jungle (INEI¹¹, 1997, cited by Ramirez, 2004). Moreover, living in these areas is very hard due to the lack of sanitary services, piped water, electricity, telephone service, public transportation and adequate roads.

Most rural schools¹² are short of school inputs and infrastructure such as teacher housing, textbooks, desks and chairs, a library, blackboards, electricity (about 75%), sanitary service (around 75%), and fresh water (approximately 55%) that makes the teacher tasks extremely challenging. Rural schools are usually “polidocente multigrado” and primary schools where the majority of students are

¹⁰ Distribution of rural areas: 14.4% coast regions, 66.2% highlands and 19.4% jungle areas. (INEI, 1997)

¹¹ National Institution of Statistics and Information.

¹² Cueto & Alcazar (2004)

distributed in the first grades and only a few are in the upper levels (some times only one student). The distance of rural schools from the cities usually isolate teachers from opportunities for interaction with their peers, professional development, and promotion through the system. Moreover, if rural teachers are native to urban areas, they may also be isolated from friends and family. Thus, all these factors make that around three quarters of the teachers that work in rural areas wanted to be transferred to an urban school.

Rural teachers can be characterized as being mostly males (56.3%) unlike urban teachers who are mainly females, and their age is around 36 years old, older than average urban teachers. In the case of female teachers, they are usually married and have small children that live with her until they are around six years old when mothers leave their children in the city for studying in a non-rural-school. In most cases, teachers live outside the community and have to travel every day to go to the school. However, teachers who live in isolated areas commonly settle down in the neighbourhood in a room provided by the school and are more accepted as a member and receive economic (food and housing) and social support from the community. Although more than half of them speak the language of the community and teach in that school for around 7 years, usually their cultural and social backgrounds are different from students and parents; in consequence they are considered outsiders and hard to integrate in the community. Furthermore, according to the 1993 census¹³, the vast majority (68%) of the unqualified (without a teacher title) teachers taught in the rural areas. Therefore, rural teachers tend to have less formal schooling, lower years of teaching experience and subject knowledge on average comparing with their peers in urban areas (McEwan, 1999; Montero, 2001; Cueto & Alcazar, 2004).

In regard to the formal and real schedule in rural schools, Montero (2001) stated that in these types of schools there is a huge spending of time in other activities than in teaching and there is almost no visits by a regional educational inspector. Classes are cancelled the last days of the months due to teachers going to the capital of the province to collect their pay-checks; or during school-days teachers go out of school for cooking, to take care of their small children or just to make some administrative arrangement. Additionally, it is claimed that in a primary school classes are from Monday to Friday, five hours a day with half an hour of break, but in rural schools the situation is totally different. The time that teachers spend with their pupils fluctuated¹⁴ within schools, regions and days of the week, and depends on the mood of the teachers and their alternative duties. Moreover, sporting activities and breaks tend to last around two hours, particularly in highland schools, leaving children without any supervision.

¹³ Peruvian Education at a Crossroad: Challenges and opportunities. (2001)

¹⁴ Montero (2001) observed a fluctuation in the time that teachers spend with their pupils in a range of 4 hours and 19 minutes as a maximum to 27 minutes in the worst case. Furthermore, this fluctuation is larger in highland schools where the maximum was 3 hours and 20 minutes.

4 RESEARCH DESIGN

This chapter deals with the research design of the project. It describes the objective of the research and the main research questions along with a description of the evaluation design and the key issues of the research model. The chapter also introduces the sampling criteria utilized to select participants, the instruments used to collect the information and a brief description of the methodology applied to analyze the data.

4.1 Objective

The purpose of this study is to evaluate the effectiveness of the pilot “rural teacher attendance incentive plan” in the year 2004. In other words, determine whether teachers significantly reduce their number of absences subsequent to the implementation of the monetary incentive plan.

4.2 Research Problem

Based on the objectives of the incentive pilot project described in chapter 3 and the experiences presented in chapter 5, this study is focused on solving three main questions related with the checking system done by parent-monitors, the teacher attendance during 2004 and finally the effectiveness of the incentive program in increasing teacher attendance. In this line the three research questions were defined as follow:

- a) Was the checking system done by the parent-monitors reliable in order to facilitate the execution of an incentive plan?
- b) How was the attendance of teachers in general in 2004?
- c) Did the monetary incentive plan increase the number of hours that teachers spend with their pupils in the treatment group contrasting with the comparison group?

4.3 Evaluation Design

The design was quasi-experimental. It included a treatment and comparison group to measure the impact of the project. The provinces and schools assigned to each group were not random. A matching procedure was used to make both groups equivalent, taking in consideration the rural character of each province. The rurality of a zone was determined using the typology proposed by Alcázar & Pollarolo (2001) which consisted of several factors that make teachers not satisfied with their position and the place where they are working. The satisfaction of teacher was characterized by the characteristic of the zone, the characteristics of the school and personal variables.

Both groups, the comparison and treatment groups differed from each other in the possibility of receiving the monetary award or not. In the case of the treatment group the checking system done by parent-monitors was implemented and teachers and schools were informed that if they reach the goal they will receive a monetary bonus at the end of each semester. Additionally an advertising campaign was carried out by regional radio and by posters in all the departments that belonged to the treatment group in order to inform teachers about the incentive plan. In the case of the comparison group the same checking system was implemented and carried out by parent-monitors but teachers and school were informed that the checking system was only a pilot project to increase the quality in education

and not an incentive plan for increasing teacher attendance. Teachers and schools of the comparison group did not receive any incentive.

4.3.1 Variables

The independent variable was the monetary bonus and the dependent variables were the hours that teachers spend with their pupils in educational activities measured by the number of checks and the number of teachers that were visited by parent-monitors.

In both groups, the attendance (number of checks) of the teachers was checked by the parent-monitors, but only teachers of the treatment group knew in advance that they could receive the monetary bonus if they reached the established goal. The teachers of the comparison group only knew that the attendance-checking system was part of a project managed by the Ministry of Education in order to increase the quality of the education. Additionally, some school context and teacher information had been collected in order to help us in the interpretation of the results.

In this framework, an expected intermediate effect is that the absenteeism rates in the treatment group decrease comparing with the comparison group motivated by the monetary bonus. On the other hand, at the end of the project it is expected that due to the increase of the teachers, the quality of the education in rural school also increases. Furthermore, if the project generalizes, better qualified and experienced teachers would feel motivated to work in rural areas due to the monetary incentives and the support of the community by the participation of parents in school activities and decisions.

4.4 Methodology

This section describes the population and sample the pilot project has been working with. It also explains the instruments used to collect the data and the methodology applied to analyse the information.

4.4.1 Population

The population consisted of kindergarten, primary and secondary teachers from 463 schools of Suyos and Frias in Ayabaca department of Piura; El Dorado department of San Martin; Canas department of Cusco; San Antonio de Putina in the department of Puno, and Vilcashuaman in the department of Ayacucho. Table 2 gives a description of the number of schools and teachers in each province.

Table 2: Number of schools and teachers by department, province and district in 2004

Department		Province	District		
				Schools	Teachers
Comparison Group	Ayacucho	Vilcashuaman	Huambalpa	29	148
			Vilcashuaman	16	53
			Vischongo	23	103
		<i>Sub total</i>			68
Treatment group	Cusco	Acomayo	Livitaca	4	21
		Chumbivilca	Pampamarca	31	154
			Quehue	8	29
			Tupac Amaru	12	69
			Yanaoca	14	61
		Canas	Mosollacta	9	33
		<i>Sub total</i>			78
	Piura	Ayabaca	Frias	92	298
			Suyos	70	254
			<i>Sub total</i>		
	Puno	San Antonio de Putina	Ananea	25	224
			Pedro Vilcapaza	10	79
			Putina	7	42
			Quilcapuquio	15	80
		<i>Sub total</i>			57
	San Martin	El Dorado	Agua Blanca	45	238
			San Jose de Sisa	9	39
			San Martín	27	105
			Santa Rosa	7	19
			Shatoja	10	36
<i>Sub total</i>			98	437	
<i>Total</i>			463	2085	

The majority of these schools were “polidocente multigrado” and primary schools (68.7%), followed with a markedly small number of kindergarten (19.7%) and secondary schools (11.7%). Moreover, more than a half of the schools were Spanish speaking (66.5%), followed by 33.5% of Quechua schools and only 1.9% of Aymara schools that were located only in Puno. Almost half of the schools (45.1%) were situated between 2 and 4 hours from the capital of the province and only few (19.9%) in isolate areas (more than 5 hours from the capital of the provinces).

On the other hand, regarding teachers who work in these schools; most of them were males (56.3%) in all level of education with the exception of kindergarten where the majority were females. Furthermore, teachers were in their thirties and early forties and most of them were married.

4.4.2 Sample

The sample was not randomly selected, thus the pilot project included the whole population for the incentive plan. However the study only worked with the data gathered in the schools of the provinces described above who accepted voluntarily to participate in the incentive pilot project. The final number of schools and teachers that participated is display in Table 2.

4.4.3 Instruments

This section describes the instruments used by parent monitors to collect the information of teacher attendance and some other registers used by the Ministry of Education of Perú for administrative purposes related with the payment of the incentives. The instrument used are describes bellow.

- To collect the hours that the teachers spent with their pupils an attendance register (F4) was used where the parent-monitors took notes three times a day checking if teachers were in the classroom doing some educational activity. These attendance registers have been picked up three times in the year (in May, August and December) by staff members of the project that work in the Ministry of Education in Lima.
- In addition to the F4 register, there are three other registers that had to be filled in advance for administrative purposes and in order to help the parent-monitors with their job. The three other registers are: School calendar and schedule (F1), School teachers list (F3) and Parent-monitors list (F5). All the registers have four copies; one for the head of the school, one for the coordinator of parent-monitors, one for the Regional Educational Office and the last one for the Ministry of Education. These three last registers had to be filled only once a year by the principal of the school or during the visit of the staff of the project if there were any last minute changes in school staff or year schedule activity (See appendix A).

4.4.4 Data collection and analysis

The data collected from the registers (F1, F3, F4 and F5) was entered by a special staff of “La Molina” university who were hired by the incentive pilot project for this task and for doing administrative arrangements for collecting the data. The process of data entry was closely supervised by the Ministry of Education to assure its accuracy. The information collected through the registers F1, F3, and F5 was used as complementary data about the schools and teacher status which supported the implementation of the incentive plan and the selection of the incentive winner. All the information was presented in a database to facilitate the analysis of the data using the statistic program SPSS.

For background data a descriptive analysis was carried out taking into consideration some school information such as the department, the type of school (“polidocente complete”, “polidocente multigrado” and “unidocente”), number of teachers per school (only for “polidocente complete” and “polidocente multigrado” schools), distance from the capital of the province; and some data about teacher characteristics such as age and gender.

All the data collected from the register F4 was used to verify the effectiveness of the checking system done by parent-monitors, the attendance of teachers and the percentage of teachers and schools that reached the individual and group award. The results were displayed by department and divided into treatment and comparison groups. In addition, the attendance of teachers in 2004 was compared with the attendance in 2003 in order to see if there was an improvement in the attendance of teachers through the years.

5 LITERATURE REVIEW

Operational Definition

An incentive plan is an oriented strategy to modify the behaviour of teachers or a group of teachers of a school to reach a goal attainment. It consists of the direct or indirect evaluation of teacher behaviour, and can include monetary and/or non monetary awards.

In the present section we will explain some of the main concepts that sustain the contemporary approaches of educational incentives to teachers.

5.1 Accountability

The term accountability is related to a recent international tendency that suggests that all public institutions have a responsibility for the quality of their performance, and therefore must give accounts of how they have fulfilled this responsibility. In the same direction, Scheerens, Glas & Thomas (2003) remark that accountability in education means that schools should provide information on their performance and functioning to outside parties. Outside agencies which have interest in quality of education, may use this information for sanctioning (provide rewards or punishment). Furthermore, these authors described some global developments that have stimulated demands for accountability in education, these are:

- The growing realization of the increasing importance of education.
- The high cost of education, which in many countries is the highest post in government expenditure, led to an increased concern with the efficiency of education provisions.
- An increased sense of openness and making public sector provisions in general accountable for the quality of their services.

Since the taxpaying public, the business community and policymakers pressure the education system to produce results and to link pay to performance, many research and projects have been developed in order to increase the quality in education. One of these approaches consists of working with teachers by improving their living conditions which includes salaries and other benefits.

As Mizala & Romaguera (2004) claim, teacher incentives is an important topic in relation to the quality on education which is also closely linked to accountability. For these authors, the main question is whether teacher remuneration structure and career development creates incentives to change their behaviour and improve their performance.

5.2 Theories of motivation and incentives

An interesting aspect around the incentives is the foundation of the change, in other words to analyze why given an incentive a teacher could want to change his/her conducts so that it increases the probability of obtaining such incentive.

About this subject, Odden & Kelley (1997) make a summary of the principal theories and context in which the incentives work:

5.2.1 Contingency theory

Contingency theory postulates that compensation and incentive programs work when they fill well the basic strategies and characteristics of the large organization, including, more specifically, its human resources practices. Additionally, Cumming (1994) (cited by Odden & Kelley, 1997) states that the organization must support the processes that the incentive plan emphasizes.

5.2.2 Goal-setting theory

The goal-setting theory claims that goals motivate employee behaviour when they are specific, challenging, and accepted as worthwhile and achievable. Indeed, research shows that simply setting clear and measurable goals motivates employees to high performance. In this respect, Wright (1989) cited by Odden & Kelley (1997) demonstrated that incentives pay increases employee commitment to goals. Moreover, other empirical research shows that larger incentives rewards can be provided when employees set more challenging or multiple goals, thereby reinforcing the importance of goal setting (Heneman, 1998).

In regards of incentive programs and motivational theories, incentive pay is easily embedded within goal-setting theory simply by adding a financial award to the attainment of goals. In this line, Heneman (1998) concludes that motivation will be greatest when goals and rewards which largely include financial rewards, are coupled (through a performance award) rather than separate as two solitary issues. Furthermore, Chapman, Snyder & Burchfield (1993) claim that the loose pairing of rewards to behaviours typical of an indirect linkage reduces the effectiveness of incentive systems in shaping teacher behaviour, though it typifies the level at which most national, centralized efforts presently operate.

5.2.3 Expectancy theory

The expectancy theory or the so called theory of employee to perform is a cognitive concept based on the premise that employees performance is guided by several cognitions that combine to determine how much effort they will expend toward some level of job performance¹⁵. Individuals will be motivated to change their behaviour if they understand program or organizational goals and if they have a “line of sight” from their own behaviour to achievement of the performance goals and to an outcome that is valuable to them (Kelley, 1999; Kelley, Heneman & Milanowski, 2002).

This motivational theory also postulates that people will respond favourably to an incentive program if three conditions are met: First people must believe that they can accomplish the goal embodied in the incentive plan and that doing so is substantially within their control (expectancy). To achieve this expectancy, successful goal accomplishment must be considered as realistic, and workers must believe they have the ability, skills, competencies, and authorities to accomplish the task being rewarded.

¹⁵ Heneman, 1998

In the second condition, employees must perceive a connection between their individual effort and receipt of a reward (clear goal). In other words, they should have the subjective probability that high effort will lead to high performance¹⁶. Because the line of sight between an individual effort and an award is potentially the most direct, incentive programs closer to individuals, such as competency-based pay or team performance award, have the strongest empirical support for their effectiveness in stimulating motivation (McMeekin, 2000).

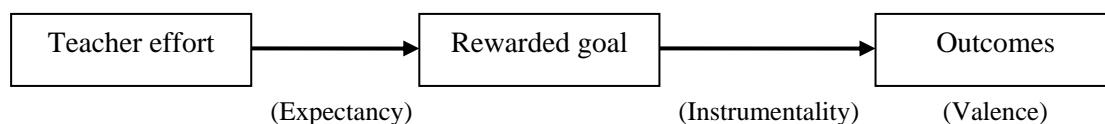
A third condition is called valence and means that employees must value or desire the reward itself enough to apply the effort to achieve it. The value outcomes could include professional effectiveness, professional collaboration such as school and group based pay, and financial incentives.

Finally, Heneman (1998) includes another factor to the ones stated by Odden & Kelley (1997), called instrumentality in which the employee has the subjective probability that high performance will lead to the occurrence of various outcomes such as a monetary bonus or public recognition.

To summarize this theory Kelley, Heneman & Milanowski (2002) claimed that:

“to be motivated to exert effort to achieved the rewarded goals, teachers must believed that their effort will lead to goal achievement, that goal achievement will lead to certain outcomes, and that the outcomes on balance have positive valence” (p. 379)

In addition, this teacher motivational theory can be graphed as follows:



Graph 2: Expectancy theory (Adapted from Kelley, Heneman & Milanowsky, 2002)

To conclude, Heneman (1998) criticizes the expectancy theory considering it as incomplete in several aspects. As he claimed,

“Expectancy theory did not incorporate aspects of goal setting so important to SBPA (School-Based Performance Award program) programs, it did not identify potential resources of influence on expectancy and instrumentality perceptions within a school context, and it dealt only superficially with the fact that both positively valent (such as bonuses, public praise for student achievement goals, sense of pride and accomplishment from having students reach the achievement goal) and negative valent (such as sanctions, not receiving a bonus, heightened job stress, public displeasure, not meeting student achievement goal and threats to job security) outcomes can occur with in a SBPOA program.” (p. 44)

¹⁶ Heneman, (1998) calls this aspect of the expectancy theory expectancy, but according to his description, it fits better in the aspect “line of sight” described by Odden & Kelley (1997).

5.2.3.1 Categorization of rewards

Another concept related with the expectancy theory is the notion of reward. According to Chapman, Snyder & Burchfield (1993) there are two types of rewards, intrinsic and extrinsic. The first kind of rewards is primarily internal and intangible, such as pride in work for achieving a sense of effectiveness, personal sense of accomplishment, etc. On the other hand, extrinsic rewards are external and material such as pay, promotion or prizes from instructional supervisors and community leaders.

Mittchel & Jo (1988) in regards to intrinsic and extrinsic rewards in education filed claimed that research has demonstrated quite clearly that teachers are most sensitive to intrinsic rewards directly linked to their relationship with students and co-workers. In addition, Kelley (1999) found that teachers in Maryland, a state that pays rewards in the forms of school improvement, tended to talk about reasons to change teaching practice more in terms of intrinsic motivation such as the desire to pursue better educational practices. However, teachers in Kentucky and Charlotte-Macklenburg schools, which received a salary bonus, were slightly more likely to frame their motivation in an extrinsic ways, in terms of a desire to achieve reward status or avoid sanctions. In addition to these findings, in a study about the motivation of teachers Diamantes (2004) found out that the teachers are more motivated for not tangible prizes such as recognition of their work and job security than for good pay or better working conditions.

Taking into account these different kinds of rewards, based on the Maslow Hierarchy of need model, Whaley & Wolfe (1984) proposed the creation of an incentive system based on cooperating teacher need for esteem, self-actualization and knowledge, related more with intrinsic rewards instead of extrinsic prizes or bonus. For them, the needs for esteem can be satisfied by a variety of potential incentives such as provision of released time which could be both substance and a symbol of prestige for classroom teachers. Another possible incentive could be giving titles such as “Master Teacher” or “Clinical Professor” that also promote prestige within teachers and in the community. Additionally, the authors found that aside from financial rewards, meaningful participation in teacher education (recognitions, input and control in the process, etc.) is the most important incentive for being a cooperating teacher.

5.2.4 Social Dilemma Theory

This theory addresses motivation and behaviour under group incentive programs such as SBPA programs. It proposed that, in group situation, individuals have incentives to become free riders to shirk in their work effort and still receive incentive pay for the extra effort put forth by co-workers (McMeekin, 2000).

5.2.5 Participative Management Theory

The participative management theory suggests that when employees, particularly highly educated employees, have a voice in important decisions on both organizational objectives and job-specific duties, they are more motivated to work and to be committed to the organization.

Aside from financial reward, meaningful participation in teacher education, as defined by status of recognition, input, and control in the process, could be the most important incentive for a teacher (Whaley & Wolfe, 1984). Other means of rewards related with the needs for esteem and prestige are provision of release time and recognition titles such as “Master Teacher”.

5.2.6 Hawthorne Effect

The Hawthorne effect or the so called “Somebody Upstairs Cares” syndrome is a work motivation assumption which proposed that individual behaviours might be altered because they know they are being studied or supervised. As Rossi, Freeman & Lipsey (1999) stated, the Hawthorne effect is not specific to any particular research design, so it could be presented in any study involving human beings.

Elton Mayo and other colleges were studying the effects of varying illumination levels, but during the research, there was continuous observation of work-group members. The researchers reasoned that the workers took the fact that they were being given so much attention by researchers as a sign that the firm was interested in their personal welfare. The workers’ response was to develop a high level of work-group morale and increase their productivity. The major finding of the study was that almost regardless of the experimental manipulation employed, the production of the workers seemed to improve. One reasonable conclusion is that the workers were pleased to receive attention from researchers who expressed an interest in them. In other words, the mere act of showing people that you are concerned about them usually spurs them to better performance (Diamantes, 2004).

5.3 Incentive programs

An incentive can be defined as an extrinsic motivator or reward for the achievement of a goal defined in advance that will be measured. Kemmerer (1987)¹⁷ divides incentives in two types: Monetary and non-monetary and remarks that an incentive program can include one type of incentives or a combination of both.

1. Monetary incentives include direct and indirect monetary benefits.
 - a) Direct monetary benefits are defined as the package of salary, allowance and fringe benefits offered to teachers.
 - b) Indirect monetary benefits include all other resources provided to teachers that are financed by government and communities. These could include professional support the teachers receive, pre and in service training, teachers guides, textbooks, instructional supervision and personal support incentives, such as free or subsidized housing, food, or transportation.
2. Non-monetary incentives refer to such things as status in the community, choice of location for the next assignment and recognition and approval of significant people in the teacher life; which are hard to calculate in dollar terms.

Taking into consideration these concepts and giving a more specific definition, an incentive program can be describe as a system developed to modify the behaviour of individuals or groups of individual

¹⁷ Cited by Chapman, Snyder & Burchfield (1993) and Mautle & Weeks (1994)

in the interest of goal attainment. As Chapman, Snyder & Burchfield (1993) state, “in the case of teacher incentives, the short-term goal is to improve teacher performance, usually in pursuit of the longer-term goal of improving student performance” (p. 303)

5.3.1 Categorization of incentive programs

In many countries teacher pay is based on a single salary schedule, but although it has several advantages such as familiarity, predictability, and ease of administration; it has also received many criticisms. Some criticisms consider single salary schedule as unfair because it rewards teachers with the same education and experience with the equal amount despite different levels of effort, skills, professional competencies or student results. Furthermore, it is seen as not adequate for the issue of competencies, involvement in school management and high level of performance that schools require today.

In addition to the problems related with the single salary schedule; changes in the organization of schools, the roles of teachers and an increasingly internationally competitive environment have heightened the importance of developing clearly aligned and directed incentives structures in schools. In that direction, many countries have developed several incentive programs trying to increase student performance and outcomes.

In this context, there are four main incentive options for paying employees that actually exist: pay for membership, performance-based pay, job-based pay and skills and knowledge-based pay.

5.3.1.1 Pay for membership

Pay for membership is a traditional pay system in which an entry level of compensation is offered to new members (Odden & Kelley, 1997). Starting salaries are set at high levels to attract an adequate number of appropriately skilled applicants away from other opportunities in the market and to provide sufficient compensation to retain new teachers until they can increase compensation through other elements of pay system.

A common example in the educational field is providing pay incentives to induce teachers into hard-to-recruit areas, such as rural regions, or special and bilingual education. This incentive program is common use in many Latin America countries such as Perú, Chile, Mexico and Brazil (Montero, 2001; McMeekin, 2000; Lopez-Acevedo, 2000; Delannoy & Sedlacek, 2001) and in some states in the United States (Murnane, 1993; Collins, 1999) in order to attract and retain teachers in rural areas.

5.3.1.2 Performance-based pay

Performance-based pay is the most common incentive program implemented in the last three decades. The main objective of this payment system is to stimulate a better performance in teachers. Performance-based pay can be divided in four categories: merit-pay, contingency pay, and school-based or group performance award. For each type of performance-based system, we summarize their salient characteristics, strong points and limitations.

5.3.1.2.1 Merit-pay

Merit-pay or individual performance-based pay can be defined as any system of teacher award (usually individual monetary bonuses or an additional payment to the base salary of the order of 10 to 40% of the average teacher monthly salary), that establishes a link between the salaries of individual teachers and evaluation of their performance usually determined by a supervisor or by peer review. (Murnane & Cohen, 1986; Conley, 1999; and Odden & Kelley, 1997).

This model maintains a top-down decision making style, a centralized structure, a steep hierarchy, and a stable set of job skills. Consequently, the success of merit-pay depends greatly on the ability of principals and peer teachers to identify and define “good performance” or “good teaching” which is a very difficult task even for educational experts and researchers.

Merit-pay tends to work best in settings where the work technology or process is relatively simple and well understood, straightforward methods can be used to measure performance and workers’ efforts are not interdependent. In education, despite of some failure cases, there were some successful experiences in private education in the United States and in some public schools when the behaviours assessed were easily observed aspects of teacher performance such as teacher attendance (Jacobson, 2001, Glewwe, Neuman & Kremer, 2003; Ballou, 2001; cited by Dee & Keys, 2004) or student attendance rates (Ebert, Hollenbeck & Stone, 2002).

Due to the reasons stated above, the merit-pay system was fraught with difficulties and oppositions from teachers and teacher unions and at the present is hardly used in public schools (Johnson, 1984; Mathes, Tollerud & Langeveldt, 1990; Conley, 1999; Desander, 2000; Eberts, Hollenbeck & Stone, 2002; Sambar, 1998).

The principal criticisms of this type of incentives are:

- a. It is difficult to measure the performance of an individual teacher (validity of the evaluation procedure) given the complexity of the educational work and the agreement about what the “art of teaching” is (Dee & Keys, 2004; Desander, 2000; Murnane & Cohen, 1986; Firestone, 1991; Mohrman, Albers-Mohrman & Odden, 1996). Given the difficulty of establishing evaluation standards, it is easy to use the incentives as a reprisal, rather than as a stimulus.
- b. It is hard to attribute educational results to an individual performance when teamwork is involved (Dee & Keys, 2004; Desander, 2000).
- c. This kind of incentive encourages independence rather than cooperation and diverts employees’ commitment from group goals to personal goals. It tends to promote competition between teachers instead of cooperation by trying to identify a small percentage of the “best” or “excellent” teachers (Johnson, 1984). Additionally, Ballou & Podgursky, 1993 stated that teachers have viewed merit-pay plans as unfair and divisive, promoting competition that is counterproductive to a collaborative atmosphere and having a demoralizing effects on non-recipients (Murnane & Cohen, 1986; Del Valle & Atchison, 1992). In this respect, Murnane (1993) adds that many teachers who do not receive merit-pay respond not by trying harder in the hope of subsequently doing so, but rather by reducing their effort and willingness to cooperate with other teachers.

- d. Merit-pay plans are costlier to administer and run than single salary pay schedule and their cost is difficult to predict (Johnson, 1984; Heneman, 1998; Desander, 2000). Clees & Nabors (1992) also added that from an administrative perspective, individuals responsible for implementation and supervising merit-pay plans have found it to be unduly burdensome and time consuming. In this respect, Murnane & Cohen (1986) found that the long-term programs tend to reward a large percentage of teachers, if not all teachers, and that rewards were most often provided for performing additional tasks, rather than for excellent teaching.
- e. For Conley & Odden (1995) a difficulty in applying the merit-pay concept to education is that such plans are based on the assumption that extrinsic rewards are necessary to motivate teachers to improve their performance. However, as Diamantes (2004) stated, money is not the principal motivator in teaching. Teachers enter the profession because they value the extrinsic reward that result from reaching students and helping them to learn.
- f. A select number of teachers are rewarded but the overall quality of instruction does not improve. There is only little positive evidence that students with merit-pay teachers have gained higher scores (Dee & Keys, 2004).
- g. Teachers do not participate in the development and implementation of the system (Ballou & Podgursky, 1993; Conley & Odden, 1995).

In addition to these criticisms, Murnane (1993) and Delannoy & Sedlacek (2001) present some negative responses that teachers could have against merit-pay systems. These responses include some opportunistic behaviour such as teachers trying to get merit-pay by lobbying for the most able students, hoarding teacher materials so that others teachers do not appear effective and spreading rumours about other teacher deficiencies. Such responses may enable to appear more productive in the eyes of a supervisor, but they are harmful for the education of the students.

Some states and districts in the United States that adopted this incentive program are: Fair Country Public School District in Virginia (Odden & Kelley, 1997), Kansas City in Missouri (Clees & Nabors, 1992), Arizona, North Carolina, Ohio, Tennessee, Texas and Utah (Del Valle & Atchison, 1992). Podgursky (1997) cited by Dee & Keys (2004) added that only 12 percent of school districts use merit-pay and that the amount of incentive pay in these districts average only 2 percent of base pay.

5.3.1.2.1.1 Merit-pay bonuses based on student performance assessment.

Many merit-pay systems require measuring teacher effectiveness. One of the approaches typically used is through student assessment scores.

Even though there are some reports of successful bonus programs that reward teachers by the result of student assessment, they still have some opponents. As Delannoy & Sedlacek, (2001) and Glewwe, Neuman & Kremer (2003) stated, in many countries unions and professional educators resist this approach arguing that linking compensation to test scores is invalid because of the multidimensional and non-linear relationship between educational input and outcomes and due to the fact that only some aspects of teacher tasks are measured by test scores. Additionally, by linking the teacher incentives award directly to student performance, the teacher was no longer in complete control of the outcome (Farnsworth & Debenham, 1991; Clees & Nabors, 1992) and if applied in a mechanistic way, it could penalize teachers whose students come from disadvantaged backgrounds such as rural students.

Another criticism to this approach is related with perverse effects on teachers. In this line, McMeekin (2000) claimed that due to pressure and stress, many teachers were tempted to select students and encourage weak pupils not to participate in “high stakes” learning assessment, helped students during tests, or even worse, force students to repeat grades or even drop out in order to increase average scores on the exam. Additionally Murnane & Cohen (1986) remarked that only if all subjects are assessed, there is a risk that teachers spend more time and effort teaching the subject being evaluated.

In addition, McMeekin (2000) recommended that in order to have a successful incentive plan based on student performance the student assessment system has to be accepted and approved by the educational community and the evaluation procedure must be both fair in practice and perceived as fair by teachers.

Furthermore, he suggested that in order to lower the incremental cost of the information needed and make the evaluation system economically viable, the country needs a broad examination system that is already working and not to create a system only for the incentive purpose. This mean that a country that has no system of testing that measures all schools (instead of a sample) would face both, the cost of developing the testing system and all the negotiation cost involved in establishing it and developing its credibility.

5.3.1.2.2 Contingency pay

As Murnane & Cohen (1986) mentioned, contingency pay or also called small grant programs, can be seen as a merit-pay program that has weathered the test of time, that is, those programs essentially pay teachers for engaging in extra tasks such as innovative teaching projects in their classroom.

This approach makes a portion of pay contingent on the undertaking of specific activities. Payment could be contingent on individual or group participation in an activity. As Odden & Kelley (1997) state, contingency pay can be used for two basic tasks: First, to better focus organizational attention on quality staff development and training programs or efforts to collect and analyze data to monitor and improve school performance. Secondly, it can be applied in order to develop additional approaches for continuous school improvement or innovation.

Additionally, Murnane (1993) explained, in these incentive programs, teachers or schools apply for the grant by writing short proposals describing their intervention program and how they would use the granted money. The grant is typically in the range of 5% of teacher salary and the money has to be used in their teaching program such as in the case of Israel (Lavy, 2002) where schools that gained the grant used the additional money to add teaching time, to split classes into small study groups and to provide extra coaching to weak students.

Unlike merit-pay programs, in contingency pay teachers know specifically what they must do to obtain the grant (write a clear proposal); the program provides energetic teachers with recognition; and the award money is used to promote instruction and not simple a salary bonus. Additionally, evaluations of such programs in the United States indicate that they have raised the morale of energetic teachers and have resulted in a variety of innovation projects.

5.3.1.2.3 School-based or group performance award

Group performance award, unlike merit-pay, is a performance pay on a team and organizational level, which provides salary bonuses to all teachers or a group of teachers in a school for the achievement of a pre-determined educational objective such as improvements in a standardized performance test, reduced failure rates, lower absenteeism among students and/or teachers, development of school projects, etc (Kelley, 1999). The service or product relies heavily on the work of many persons and in the interactions among them. Hence, a portion of each team member pay can depend on the results of the team effort as measured by team and organizational performance.

School-based performance award programs allocate monetary awards to teachers for their performance during a specific period of time (typically one year). The amount of the bonus is normally divided equally among the teachers in the school and is provided in addition to the teacher base salary (Conley, 1999; McMeekin, 2000). However, as Kelley (1999) mentioned, the payment of the award could also be in the form of school improvement funds or materials such as text books, desks, computers, etc. She found that the first kind of award has more impact on the motivation of teachers, while the second one has better effects in motivation of principals as school budget tends to be their responsibility.

Regardless of the nature of the group, group performance awards could include all teachers in a school, all teachers in a unit or level of education (primary or secondary) or individuals in various teams. However, as Odden & Kelley (1997) mentioned, the “line of sight” between work effort and a performance award is strongest for team awards and weakest for organization-wide awards (all the teachers in a school) or district-based (or group of schools) performance awards because teachers might believe they can have little influence in a broad group and outside of their own school.

The advantage of this approach is that it can promote cooperation among teachers and other school workers to achieve shared objectives. It leads to internal changes in school organization and motivates teachers to work together to win the award. Teachers act as a group, evaluating each other’s performance disseminating new ideas, and working together to solve common problems (Conley, 1999). In addition, Ladd (1999) concludes that the incentive programs assigned not to specific individuals but to schools can have positive effects in the academic achievements of the students because school-based awards reduce the risks of internal quarrels caused by the competition and generate a spirit of group collaboration, which could be also very positive for the atmosphere of the school. Another advantage of school-based performance award is that it can be combined with other kinds of incentive programs such as merit-pay system as a support to individual incentives.

On the other hand, this model also received some criticisms because it can cause some negative effects such as the promotion of “free riders” that can discourage the best teachers, who can perceive themselves equally awarded in contrast with those who do not make any effort and not collaborate properly. However, as Glewwe, Ilias & Kremer (2003) stated, in a school-based incentive program teachers are in relative good position to monitor each others’ performance, mainly on easily observed aspects such as attendance and in this way reduce the “free riders” effect.

Another criticism to this program is related with the teacher feeling of stress and moral hazard. In this line, Kelley (1999) reported that this kind of accountability programs increase teacher stress, mentioning that 87% of teachers in Kentucky and 72% in Charlotte-Macklenburg schools experience more job pressure and stress than before the implementation of the program. She also remarked that this stress might be greater for teachers in schools with insufficient organizational supports to help them in achieving program goals. Additionally, improvement focused on programs which require that schools continue to improve in order to meet the program goals, could also make the school a more stressful work environment. Another cause of stress could be the variation in the academic abilities of cohorts of students because of migration in rural areas or as a result of closing a school and students going to a new one. This situation can add stress on teachers, since these pupils represent a part of student performance where teachers have little control over.

Morduchowicz (2002) mentioned some troubles in the implementation of school-based awards in public institutions such as public schools. He claimed that unlike private institutions, public organizations are not afraid of breaking down since they will always receive funds from the government, so they are less motivated to work hard. Another organizational disincentive is the lack of competition in the public sector which can be an obstacle to introduce a market approach in public education and a school-based award.

Finally, in the United States, several states and some school districts such as Round Valley School district in Northern Carolina (in the early '80s), Dallas-Texas, Kentucky, South Carolina, North Carolina, Tennessee, Georgia, Indiana, Maryland and Colorado have adopted this type of incentives. (Ladd, 1999; Conley, 1999; Kelley, 1999; Odden & Kelley, 1997; Clees & Nabors, 1992). This incentive plan has also been implemented in some Latin America countries such as Bolivia, Chile and El Salvador (Mizala & Romaguera, 2003, 2004; McMeekin, 2000) and in Kenya (Glewwe, Ilias & Kremer, 2003) with significant success.

5.3.1.3 Job-based pay

This approach was first implemented in the private sector in the late '60s and early '70s. Jobs were ranked according to several factors that apply to all jobs (for example complexity and degree of supervision required). Employees with jobs deemed more complex or important were paid higher salaries, and employees seeking to advance must enter jobs with higher-ranked duties (Conley & Odden, 1995)

In education, job based-pay is traditionally most evident in administrative positions, where teachers improve their salaries by accepting new administrative responsibilities, such as in the case of male teachers in Perú and in other developing countries (Liang, 2000; Montero, 2001).

A good example of job-based pay system in the education field is the career-ladder program.

5.3.1.3.1 Career-ladder programs

The career-ladder was first implemented in the United States in the 1980s as an alternative incentive plan that sought to solve the problems found in merit-pay¹⁸ programs and in the single-salary schedule.

Career-ladder programs tied teacher pay to career-level advancement within the profession and provide incentives and salary increases for teachers to keep them into the profession. A career-ladder program sought to identify school workers (teachers and administrators) whose performance met or exceeded standards for practice and provided them with leadership positions, such as curriculum or professional development and administrative positions (Odden & Kelley, 1997; Matthes, Tollerud, & Langeverldt, 1990).

A career-ladder program can include several positions in different levels of complexity, starting with an initial level until a level of complete development and expertise, usually divided in three or four levels. The promotion of teachers is not based exclusively on years of experience nor on his/her educational level; instead, it is based on requirements that teachers know in advance, including for example, training, proven experience and performance.

Conley & Odden (1995) and Lieberman (2002) compared different career-ladder programs and they found that all these plans took into account at least three basic aspects for promoting teachers: level of responsibility; level of knowledge and skills; and professional growth through activities that complement their teaching work. In addition, unlike in merit-pay programs in these career-ladder plans usually the participation of teachers is voluntary and has “quotas” on the number of teachers for leader positions (Siegel, 1985).

Career-ladder programs have several advantages as an alternative to merit-pay plans. As Lieberman (2002) claimed, career-ladder plans do not work against the school organization and school climate since they do not force teachers from a single educational institution to compete for a given sum of money, which only some would finally receive. Instead, all teachers that achieve the standards and skills could increase their salary. Additionally, career-ladder plans offer the advantage of avoiding the subjective performance evaluation via supervisors or peers that can be observed in merit-pay systems.

However, job-based pay and specifically career-ladder programs receive also many critiques. First, it can define classroom teaching as less than professional level by implying that teaching functions are less important or require less expertise than tasks performance at the next level. Second, most career-ladder programs remove the best teachers from the classroom. Third, like merit-pay plans, career-ladder systems have funding problems as these incentive programs are expensive and the total costs can be difficult to predict. The costs for career-ladder programs are not limited to teacher salary supplements, but there are other associated expenses such as: fringe benefits, staff time in planning and administering the program, performance appraisal, and the intricate process of evaluation. This

¹⁸ Even though the career-ladder program has been launched in order to solve some of the problems presented in merit pay plans; in some cases this system can also be part of a career-ladder program such as in the incentive project implemented in Utah (Del Valle & Atchison, 1992)

last process also includes other expenses, for example: the salary of the teacher evaluators, release time away from classroom, training of the evaluators, and scoring and analyzing the results (Siegel, 1985). Furthermore, another criticism is based on the fact that they continue to reward and encourage uniformity, although in this case within each respective category.

It is also argued that the purpose of career-ladder plans is to provide all teachers with opportunities for growth in their career. However some opponents of this kind of incentive plan found that in some schools, opportunities for promotion were limited, often giving a rise to a group of “elites” in a school increasing competition among teachers for scarce top-level positions, which ultimately hindered teacher collegiality and contributed to teacher isolation (Conley & Odden, 1995; Lieberman, 2002).

5.3.1.4 Skills and Knowledge-based pay

Skills and knowledge-based pay plans compensate individuals for the depth and variety of skills they possess and are able to use on the job. The advantage of skills and knowledge-based pay plans in education is that teachers would receive rewards for developing greater breadth and depth skills in core teaching areas, as well as management skills such as budgeting and curriculum development, which would allow them to remain in the classroom rather than abandoning classroom teaching for higher-paying administrative positions.

As the Consortium for Policy Research in Education (CPRE) (cited by Goorian, 2000) stressed skills and knowledge-based compensation systems can and should reward teachers for acquiring whatever skills a school needs. Thus, a plan could encourage and reward teachers who learn skills such as budgeting and curriculum planning, which might allow talented individuals to both teach and perform administrative duties, instead of leaving teaching altogether for better-paying administrative jobs.

The most common current form of teacher compensation, the single salary schedule, is viewed as one type of skills and knowledge-based pay which ties pay to indirect indicators of skill expansion such as number of years of teaching and total number of college credits or degrees. On the other hand, career development plans and payment for competencies are being used as models for the new incentive plans in since they involve direct measures of skills and adjust better to the new conception of school and teacher work.

For each type of skills and knowledge-based compensation system, we will summarize their salient features, advantages and limitations.

5.3.1.4.1 Career development plan

Career development plans can be conceptualized as an additional form of teacher skills and knowledge-based pay. This approach can be seen as an ideal type of career-ladder system which has been modified in last decade offering salary increment or incentive bonus to teachers according to their skills and knowledge in order to retain them in the classroom. (Morduchowicz, 2002; Mizala & Romaguera, 2004). This system has the same characteristics of the career-ladder plans but teachers are assessed according to their skills and knowledge instead to the job they have to perform.

Conley & Odden (1995) showed four successful experiences implementing career development plans, three in the United States (Flowing Wells in Arizona, Charlotte-Mecklemburg in North Carolina and Pocatello in Idaho) and a career development system in Canada. Based on these experiences, the authors elaborated a career development plan model which consisted of three components: starting pay, career stages that would qualify a teacher for a major pay increase and finally, a mechanism for increasing pay each year not based on the knowledge and skill enhancement. In their model, they recommend that the salary increment associated with each career promotion should be 20 to 25% of the basic payment and that it also could be enlarged with some type of group or school-based performance award.

Career development plan, unlike other payment systems has the potential to tie pay to variables that are under control of teachers and encourage teachers to take greater responsibility for their collegial involvement and their compensation. Additionally, Mizala & Romaguera (2004) taking into consideration the Mexican experience have concluded that

“the career-ladder (career development plan) has made it possible to raise teacher income and improve their (teachers) training and their knowledge. Similarly, this experience has made possible for teachers to accept external evaluation and objective testing, thus improving the legitimacy of accountability policies” (p. 751).

5.3.1.4.2 Payment for competencies

Since the context surrounding teaching and education has changed in the last few years, the demands from teachers have also changed. The new educational tendencies considered schools as dynamic environments which are flexible to changes and able to adapt their activities according to the new requirements of the community and society in general.

Payment for competencies is the new approach of paying centred on the person rather than linking pay to a particular job such as in performance-based pay and job-based pay systems. As Odden and Kelley (1997) stated in their book “Paying teachers for what they know and do: new and smarter compensation strategies to improve schools”,

“competency-based pay, pay for knowledge, pay for professional expertise, collective rewards for adding value to performance, and gainsharing¹⁹ have become the core of new compensation strategies” (p.13).

These authors also claim that early research on competencies-based pay suggested that it should be paid as an increment to base pay (and not as part of the regular salary) because the additional skills and competencies that were developed increase the long term value of the individual to the school besides the regular teaching task.

Payment for competencies is based on the idea that if common minimal standards of performance are taken into account, schools can prepare and pay teachers for those aspects and functions that the institution needs to develop. This approach links teacher salaries to proof of some competencies,

¹⁹ In the gain sharing compensation system, individual, team, and or organizational bonuses are paid as a reward for identification of improvement in organizational processes that lead to increase efficiency.

making it possible to increase pay according to each teacher characteristics and progress. It creates a pay raise obtained by demonstrating a pre determined set of competencies.

Lieberman (2002) organized this set of competencies that teachers should reach in three areas:

- a) Instructional competencies which include general information and knowledge in a particular school subject.
- b) Competencies in other areas of education. These competencies include expertise in activities linked with the school but not with instruction such as student coaching, evaluation of educational materials, and development of educational innovations.
- c) Administration and leadership competencies. They include the necessary skill for coordinating teamwork, coaching and training other teachers, developing institutional projects and administration processes.

To evaluate these sets of competencies, some states in the United States, such as Ohio and Colorado, are incorporating relatively new assessment tools produced by the Educational Testing Service (ETS) and the Council of Chief State School Officers (CCSSO) into their compensation systems. These tools, known as Praxis and INTASC assessments, assess and test a teacher core content knowledge as well as clinical teaching practices and pedagogy (Goorian, 2000).

Lawler (1995) cited by Lieberman (2002) stated that payment for competencies has several advantages comparing with other incentive programs. First, these plans are flexible and let a person develop different kinds of tasks. Secondly, payment for competencies is compatible with organizations which depend on the knowledge and aptitudes of their workers such as schools. The third advantage is related with the professional growth of teachers. Teachers can grow professionally in the same position without the necessity to be promoted to another job or work in an administrative position.

Kelley (1999) added another advantage claiming that payment for competencies is a very flexible incentive approach since the different educational actors (government, schools) can elaborate and define the areas that they want to work. This flexibility would let each school be a unique organization with organizational and pedagogic designs according to their characteristics.

On the other hand, there are some opponents arguing that this approach is based on the notion that teacher work could be reduced to and assessed by a few measurable goals or competencies and do not take into account the complexity of teacher work. (Conley, 1999). Additionally, Conley & Odden (1995) claimed that the specification of “too many skills” makes some payment systems administratively complex and difficult to discern.

In the United States numerous states and districts such as Rochester in New York and Douglas Country in Colorado have provided a salary bonus to teachers who earn certificates from the national Board for Professional Teaching Standards (NBPTS) (Odden & Kelley, 1997). Furthermore, in Bolivia teachers who pass a voluntary teaching sufficiency examination are rewarded with a wage increase (Mizala & Romaguera, 2004).

5.3.2 International experiences

In order to increase the quality of education many countries have started different kinds of incentive programs. This section reviews briefly some teacher incentive plans in Israel and in some developing countries in Africa and Latin America.

5.3.2.1 Incentive programs in Africa and in the Middle-East

Besides the United States, which was the first country implementing an incentive plan in the '50s, in the '90s many countries in Africa and in the Middle East have developed different kinds of incentive systems. The following paragraphs describe the most remarkable experiences in Africa and Israel.

5.3.2.1.1 Teacher incentives in Botswana

Botswana, unlike other nations in tropical Africa, has a stable economic and political situation that contributed positively to establishing an incentive system. Some of economic and political aspects, as mentioned by Mautle & Weeks (1994) are: a stable development since the independence in 1966, a well managed economy, carefully articulated and integrated six-year National Development Plans and a rapidly expanding education system and educational reform.

In this context, Botswana has implemented a teacher incentive system during the last years that includes different kinds of incentives. Taking the model created by Kemmerer (1990)²⁰, Botswana has provided an incentive from each of its subdivisions. For instance, in terms of remuneration, although teaching is considered as a technical vocation, teachers receive a regular good salary (comparing with other African countries) and also teachers with a university degree start in a higher level of the professional ladder (that includes more salary) than their contemporaries with a non-teacher bachelor degree. In terms of allowance, teachers are entitled to allowance such as remote areas allowance, transport and transfer allowance. The major in-kind salary supplement comes through subsidized housing. Other benefits teachers in Botswana enjoy include 40 working days leave per annum, medical assistance, maternity leave and sick leave. Additionally it is important to remark that the only subdivision under remuneration category in which the State appears to have done nothing is that of bonuses. It is also important to note that any civil servant, including public teachers do not get any bonuses and there is not a merit-pay incentive plan.

In the category of working conditions, significant improvement has been made in the environment sub-category through the increment of the number of primary and secondary schools and student enrolment. Furthermore, instructional support has been improved largely through the production of materials such as teacher guides, children supplementary books and text books, etc. Supervision of instruction was improved by quantity and quality by the establishment of more Education Officer positions and freeing principals from teacher responsibilities. Finally, efforts were made to improve teacher training and career opportunities.

Chapman, Snyder & Burchfield (1993) carried out a research in order to find out the factors related with teacher career satisfaction in junior secondary school teachers in Botswana. In this study they

²⁰ A table describing the model can be found in the article written by Mautle & Weeks (1994). Additionally, a good explanation of the model can be obtained in the research made by Chapman, Snyder & Burchfield (1993).

found that the variable sets concerned with amount of instructional supervision, community support, amount of training, and opportunities for career advancement were significantly related to career satisfaction. In contrast, neither the availability of instructional material nor the provision of housing was related significantly with teachers career satisfaction. Additionally, the authors established that the incentives related to teacher career satisfaction, while possibly stimulating recruitment and encouraging retention were not significantly related to improved classroom performance of teachers.

5.3.2.1.2 Merit-pay bonuses for rural teachers based on student performance assessment in Kenya

In Kenya incentives provided to teachers by their employer are weak and almost non-existent. However, since 1998 in some schools parent committees strengthen an incentive program²¹ that provides primary school teachers in rural areas with bonuses when schools perform well on the national exams. The program awarded prizes in two categories: “Top-scoring school” and “Most-improved school”. Schools could not win in more than one category and the improvements were calculated relative to the performance in the base line. The monetary bonus valued in a range from 21 to 43% of the typical monthly salary of teachers in grades 4 to 8 and it was based on the performance of the school as a whole on the national primary school leaving exams (KCPE).

To avoid negative effects of merit-pay based on student performance assessment, the incentive programs follow some interesting strategies. For instance, in order to encourage cooperation among teachers within schools and to avoid creating incentives for teachers to sabotage each other’s work, rewards were based on the performance of all the grade 4 to 8 pupils in the school, with each subject weighted equally. In order to discourage schools from forcing weaker students to repeat, drop out, or not take the exam another strategy was used; students who did not take the test were assigned very low scores. Additionally, in order to dissuade schools from recruiting the best students to take the exam, only students enrolled in school since February 1998 were included in the computation of the school mean score.

Glewwe, Neuman & Kremer (2003) developed a randomized evaluation of the incentive program and found that the incentive program was weak because teacher attendance did not improve, homework assignment did not increase, and pedagogy did not change. In contrast, there was evidence that teachers learned over time how to take better advantage of the program by increasing effort to raise short-run test scores by conducting more test preparation lessons. Moreover, while students in treatment schools score higher than their peers in comparison schools during the life of the program; they did not retain these gains after the end of the program.

5.3.2.1.3 Teacher group performance incentive program based on student achievement in Israel

In 1995, Israel’s Ministry of Education launched an experimental incentive program to schools in the form of performance awards based on student achievement, part of which were distributed to teachers and school staff as merit-pay and the rest was used for the well-being of teachers in the school. The

²¹ The incentive program was conducted by the International Christelijk Steunfonds (ICS), a Dutch NGO, in the Busia and Teso Districts of West Kenya.

objectives of this group incentive program were to reduce dropout in secondary schools and improve scholastic achievements. The performance measures included the average number of credit units per student, the proportion of students receiving certificates, and the school dropout rate.

The program started with 62 schools, but a few more were added later. The conditions for selection were that the school should be the only one of its kind in its community and that it be a secondary comprehensive school. Participating schools competed for a total of about \$ 1.44 million which could be gained by the top third school performers. Additionally, the award was divided as follow: 75% was distributed among the teachers as a salary bonus and the remainder was used to improve all faculty facilities such as teacher common rooms.

Lavy (2002) finds in his study “Evaluating the effect of the teacher group performance incentive on pupil achievement” that rewarding Israeli teachers based on school average performance, rather than individual performance, increased test scores and participation in matriculation exams, but not the percentage of students receiving matriculation certificates. Additionally, the comparison based on cost equivalency suggested that teacher incentive intervention is much more cost effective than a contingency pay, also implemented in Israel in the same year.

5.3.2.2 Incentives programs in Latin America

In most Latin America countries, teacher salary structures share several problems such as: equal pay is provided regardless of differing efforts and abilities. Regardless of the level of performance, stability in the job position is assured. No differentiation is made between those who have more extensive education and those with less. The positions in administrative tasks are the only way of promotion. Salaries are unrelated to the activities carried out at the school and seniority is the principal basis for any pay increase. All these problems have led the economists working in the field of education to insist upon the need to reform the teacher salary structure and create incentive systems. The most common incentive programs developed in Latin America are merit-pay, career-ladders, payment for competencies, and school-based or group performance awards.

The most important incentive plans developed in Latin-America countries will be explained in the following section.

5.3.2.2.1 School-based merit award in Chile

Chile pioneered the team approach by introducing a system of merit award to schools called the National System to Evaluate School Performance (SNED) based mainly on student outcomes. The system includes both municipal (public) and private-subsidized schools in primary and secondary level and winning schools are identified every two years. The incentive system in Chile has the following characteristics:

1. The awards go to schools and not to individual teachers
2. Schools are stratified by zones and not on a national level so relatively comparable schools compete among each others.
3. 90% of the award is paid directly to all the teachers as bonuses and school directors allocated the remaining 10% to outstanding teachers in order to avoid the “free rider” problem.
4. The amount of the bonus is relatively low (approximately US\$450 per year) in order to reduce the incentive for opportunistic behaviour on the part of teachers, such as focusing teaching attention on only those subjects evaluated by SIMCE.
5. Chile’s national student assessment system (SIMCE) provides an important part of the basis on which school performance is evaluated. SIMCE is a standardized test of Spanish and mathematics skills administered every two years to students at grades 4 and 8 at the level of basic education. The reporting of the result is on the basis of school average scores and not on individual student scores.
6. Awards are based on an index composed of six factors: effectiveness, improvement initiative, improvement in working conditions, equality of opportunity and integration of teachers, parents and guardians. Most weight is located on the first two factors and on equality of opportunities.
7. Awards are fully competitive, so schools may win repeatedly.

The result of the evaluation of the second stage of the project, McMeekin (2000) stated that a system award to schools involves lower information and transaction cost than merit-pay to individual teachers. Furthermore, he suggests a greater participation of regional and provincial authorities in the process, and that besides the money award there should be greater publicity attached to winning the award so that parents and the community at large can be aware of their school being a winner.

To conclude, McMeekin (2000) showed some latent problems that can appear in the future trying to manage the award over time. He remarks that even though in the award system a school can win repeatedly, a problem arises in the difficulty of improvement of test scores as a school average score becomes higher. Another potential problem that would arise is if teachers alter their behaviour in undesirable ways to win awards, such as focusing teaching efforts only on the subjects tested in SIMCE, even though in that stage of the project there is no evidence of this behaviour.

5.3.2.2.2 Professional development and incentives for teachers in Mexico

The incentive program in Mexico is linked with the “Carrera Magisterial” that is a professional development program that was created as part of the National Agreement for the Modernization of the Basic Education. This program is aimed at raising the quality of basic education through teacher

professional training, new learning methodologies and improving teacher welfare through better salary and housing policies.

The incentive program consists of a merit-pay system in which professional staff of all level of education is voluntarily evaluated and rewarded with salary increases for their performance as classroom teachers, school headmasters, supervisors and administrators. The evaluation is based on experience (10 points), professional skills (28 points), educational school level (15 points) and completion of accredited courses (17 points). In the case of teacher performance in school, 30 points are given to student learning achievements and professional performance. As with principals and supervisors, 30 points are given to school performance and professional achievement.

Additionally, the program considered five levels of promotion (A to E) and the salary rewards allocated to each level represent a salary increase but do not denote a change in the type of post assigned to the teachers. The bonus represents a significant increment in teacher salary (around 21% in the first level and more than double in the last one).

A study to evaluate the impact of the “Carrera Magisterial” program carried out by Lopez-Acevedo (2000) found that teacher income and years of schooling have no significant effect on learning achievement. However, teacher years of residence in the community increase student achievement, possibly due to the involvement of the teachers with the community. In regards of the enrolment in the program and student achievement, results showed that at a national level and particularly in rural areas, enrolment in “Carrera Magisterial” positively impacts learning achievement, especially in rural areas. However, the level in the program is negatively correlated with student achievement. There is also not a significant difference in test score distribution between students with teachers enrolled in the program and students without such a teacher.

Another finding mentioned by Mizala & Romaguera (2004) is related with undesirable results such as the fact that teachers leave rural areas, moving to urban schools to have more ready access to upgrading courses that give them the points necessary to rise in their profession.

5.3.2.2.3 Incentive programs in Bolivia

A pay for competencies program was implemented in Bolivia in 1998 in order to create incentives for improving teacher performance. It consisted of applying a teaching sufficiency examination that measured teacher knowledge of the subject they taught. Teachers signed up voluntarily and those who passed the examination received a wage increase, while those who failed remained in the traditional pay scale system.

Unfortunately, the merit wage approach was suspended after its second application due to the high percentage of teachers that failed the examination and the opposition of the teacher union arguing that the examination process was faulty.

Lately, the merit wage program was replaced by other incentive approaches that still work until now such as: a contingency pay program called upgrading incentive (Incentivo a la Actualización Docente), a pay for membership plan called bilingual mode incentive (Incentivo a la Modalidad Bilingüe) and an incentive to retain rural teachers.

In addition to the incentive programs described above, Bolivia also introduced a school-based or group performance award in 2001 aimed to encourage teamwork among principals, teachers and administrative staff in order to improve services provided to students. The program focuses on all types of primary schools and provides an annual monetary award to the principal, teachers and administrative staff of these schools taking into consideration the following factors with the same weight: school organization, teacher training and their remaining in the school, regularity in school management, number of students per class, student-teacher ratios, teaching initiatives, parental participation, actual passing rates and drop-out and repetition ratios.

5.3.2.2.4 School-based or group performance award in El Salvador

In 2000 El Salvador launched a school-based award called PLAN (Plan de Estímulos a la Labor Educativa Institucional) with the objective to encourage teamwork between public teachers in order to solve the problems affecting their schools and improve the quality of educational services that they offer to the community.

The award offered in three consecutive years consisted of a monetary bonus (US\$ 228.6, an increment of around 6% of the basic salary) for each teacher working at all levels of education schools that met the objective established in advance by the Ministry of Education (MINEDU). For this purpose, schools were evaluated by the University of El Salvador taking into consideration the following factors and weights: school organization (25%), educational management (9%), institutional planning -actions to reduce repetition and drop-out rates- (44%) and teacher management –planning and teaching materials- (22%). As can be seen, PLAN basically emphasizes compliance with legal rules and regulation such as attendance, punctuality, school registration, etc. and does not focus on student outputs.

5.3.2.2.5 Incentive system in Colombia²²

Colombia has introduced an innovative combination of a school-based and an individual incentive plan in order to reward and recognize good teaching. Students and parents in every school are asked to elect their best teacher based on a set of criteria provided by the Ministry of Education, while every municipality elects the best school, again based on some criteria. Then the department will elect the best school from the list, based on the relative positions of the school selected by the lowest levels. The criteria focused on efforts, rather than fixed conditions.

Additionally there are awards for the best school in the nation, the best school in the department and municipalities and the best teacher. Both teachers and school would receive public recognition and a monetary bonus.

To summarize the incentive experiences in Latin America the tables presented by Mizala & Romaguera (2004) which compare the factors and weight used and the indicators and evaluation instruments applied by each country can be helpful.

²² cited in Peruvian at a crossroads: Challenges and opportunities for the 21st century, 2001

The following tables summarize and compare the incentive programs developed in the four countries described above in two main aspects: factors and weight, and indicators and evaluation instruments.

Table 3: Factors and weight in incentive systems in Latin America

Type of evaluation	Individual incentives		Group performance awards		
	Merit-pay Mexico	Merit wages Bolivia	School-based award Bolivia	PLAN El Salvador	SNED Chile
Educational Inputs	Seniority (10%)	Teacher knowledge (100%)	School organization	School management (25%)	School initiative
	Academic degree (15%)		Teacher training and their remaining in the school	Educational management (9%)	Improved working conditions (2%)
	Upgrading and professional develop (17%)		Regularity in school management	Institutional planning (44%)	
	Professional preparation (28%)		Number of student per class and Student/teacher ratio		
	Professional performance (10%)		Teaching initiatives	Teacher management (22%)	Integration of teachers and parents (5%)
			Parental participation		Equality of opportunities (22%)
Educational process					
Educational outputs	Student performance (20%)		Actual Passing rates		Effectiveness (student performance level) (37%)
			Drop out and repetition rates.		Improvement (student performance gain) (28%)

Table 4: Indicators and evaluation instruments

Individual incentives		Group performance awards		
Merit-pay Mexico	Merit wages Bolivia	School-based award Bolivia	PLAN El Salvador	SNED Chile
Evaluation using external examination written by teachers and students	External examination for teachers	Self-evaluation, teachers, principals and parents	Survey applied by external evaluators	External examinations written by students
Document accreditation		Verification using sampling		SNED survey to schools
Peer and union representative evaluation				Central information from Ministry of Education

5.3.2.3 Peruvian experiences

In Perú, a recent study (Ministry of Education and UNESCO, 2002, cited by Cueto & Alcazar 2004) showed that public school teachers consider that the first criterion that would have to be taken into account to determine the salary schedule is the periodic evaluation of their performance, followed by university degrees. It is obvious that the present system of remunerations, based mainly on the years in the educational system, is perceived as unfair by most of teachers. Moreover, such a system has as a main problem that there are no clear criteria of which behaviour is expected from teachers and also there is no performance system evaluation in order to reward those teachers who fulfil the criteria.

In a study on the teacher career in Perú, Diaz & Saavedra (2000) found that school teachers in the public sector have, in average, an income smaller than the rest of professionals and the increase of their income throughout years is very small. Nevertheless, teaching in the public schools offers very predictable income and labour stability. The stability, which is one of the most attractive elements of the educational career, generates inefficiencies in the human resources administration in the public schools. As a conclusion they asserted the teacher career is characterized by low and stable incomes and does not offer clear stimuli for innovation and better performance.

Based on the results of the previous study, the Ministry of Education ordered to the Institute "APOYO" in March of 2001 to develop a proposal to change the actual teacher salary structure. As a result of this study the document "Alternatives to optimize the incentive system to teachers from rural other special conditions areas" (Alcazar & Pollarolo, 2001) was published.

The general mission of this proposal was to improve the quality of the rural education through improving the professional quality, the well-being and performance of teachers who work in rural areas and special condition zones. The specific objectives of this project were: (i) To identify the criteria that serve to describe the zones "as special conditions" (ii) Recommend a monetary and non monetary incentive system that raises the degree of welfare of the teachers that have to work in special condition areas (assuming that an increase in the welfare and conformity of teachers will result

in a better performance, which will elevate the quality of the rural education) making the position in those zones more attractive, so that better teachers will wish to go there and remain in such places.

The current bonus system for zones with hard conditions (including two types of bonuses: bonus for differentiated zones and the bonus for rural and border areas. Each bonus of 45 soles (around €10) does not accomplish its objective. The main reason for that could be: (i) the benefits are not identified by teachers like an extra pay in their salary; (ii) the criteria by which they are assigned were not the correct ones because they were based on factors that did not explain the disagreement of teachers; 3) the application of the criteria is not updated. For instance, the bonus for rural areas is still assigned to places that have already become small cities; 4) administrative irregularities in the application of the bonus system. Indeed some teachers who are now working in the city are still receiving the monetary bonus.

The pilot project developed interviews, focus group and questionnaires to a sample of schools located in special conditions areas in five poor provinces (approximately 1.000 teachers from 550 single-teacher and multi-teachers primary schools).

According to the results of the interview, rural teachers were satisfied with the place they had to work because they were living there all their life (30%), their families are there (18%) and they have access to basic services (13%). On the other hand, the reasons why rural teachers were unsatisfied with the place they work were because of the distance from their family (28%), the impossibility of professional development (20%) and the lack of basic services (17%). Based on these results, the project identified four main factors which could explain the satisfaction or discontent of rural teachers. The first factor was the distance from the family and the fact that the teacher belongs to the community or not. The second factor was the access to basic services. The third factor was the distance from the nearest capital of the province, and the last factor was the immobility.

The study also found that rural teachers, unlike their colleagues in urban areas who prefer to be evaluated by trained teachers, claimed that the responsibility of their evaluation should be given to parents, followed by members of the community and trained agents. Rural teachers also expressed their rejection to be evaluated by the educational regional office as they do not trust on them.

Based on the interviews and focus group, the majority of rural teachers claimed that the monetary incentive should be a monthly salary bonus between 250 soles and 500 soles in order to be motivated to work in a school located in special zones, which means an increment of 100% of the basic salary of a teacher. In addition, as a non monetary incentive, rural teachers stated that they would like to receive as an incentive in-work training, followed by housing, food supply, transportation and finally, administrative arrangement to collect their payment checks.

Though the recommendations and results of the project were important, they could not be put in practice due to finance problems.

Finally, the last incentive action was carried out in December 2002. The Ministry of Education through the Coordination Office for the Development of Rural education (OCDER) decided to start a pay for membership plan rewarding teachers with a monetary bonus taking into account two factors: ruralness and bilingual status of the school.

6 RESEARCH FINDINGS

The results have been divided in three main parts in order to answer the research questions proposed in the research design. Additionally, all the analysis has been made per department in order to facilitate its interpretation. In this line it is important to take into consideration that the departments are divided in two groups. The first group is the comparison group composed of Ayacucho where the checking system was implemented but teachers would not receive any incentive. Cusco, Piura, Puno and San Martin belong to the treatment group where the checking system was also implemented but in this case teachers and schools that reached the goal received a monetary bonus at the end of each semester.

6.1 Was the checking system done by the parent-monitors reliable in order to facilitate the execution of an incentive plan?

The first question is related to the reliability of the checking system of parent-monitors in order to facilitate an implementation of a fair incentive program to rural teachers.

Table 5 describes the average of teachers and the percentage of the teacher population that was visited by parent-monitors by month. At this point it is important to remember that the population of teachers is 2085 and these is the maximum of teachers that can be visited each day. By “visited” we mean that the parent-monitor goes to the school to monitor if the teachers were there or not in order to fill the register. These numbers can give us an idea of how the checking system was working and if it covered the whole population of teachers.

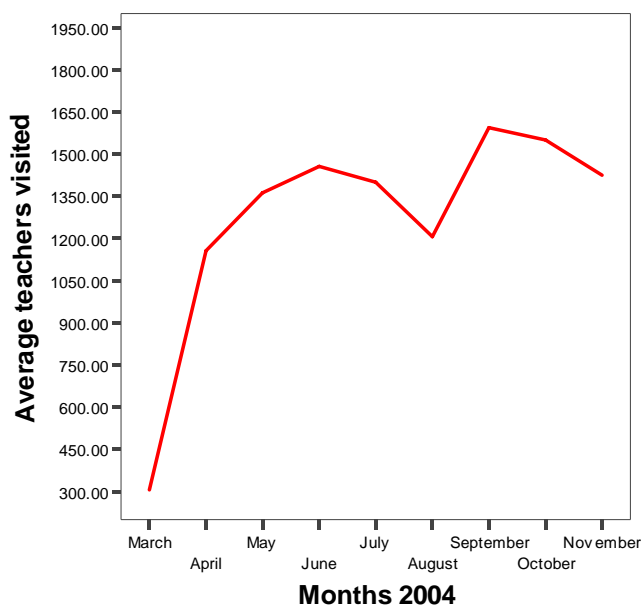
Table 5: Number of teachers that were visited by parent-monitors each month

	Minimum per day	Maximum per day	Average	Std. Deviation	Percentage of the teacher population
March	15	1134	307.69	469.895	14.75%
April	57	1318	1154.36	352.251	55.36%
May	1237	1541	1362.19	85.722	65.33%
June	538	1639	1456.27	251.547	69.85%
July	679	1643	1401.53	217.983	67.22%
August	402	1620	1210.18	485.838	58.04%
September	1551	1622	1593.45	20.409	76.40%
October	675	1630	1550.29	202.720	74.34%
November	374	1621	1423.68	328.119	68.28%

Additionally, Table 5 illustrates that the average of teachers that were visited by the parent-monitors has a big variation within the months shown by the high standard deviation in each month. An exception can be seen in May and September when the standard deviation was less than 100 and the difference between the minimum and maximum teachers that were visited was smaller. March and August show the highest standard deviation and this concedes with the months with smallest number of teachers that were visited in the year.

Furthermore, in 2004 the average of teachers that had been visited decreased by month from 1593.45 in September to 1423.68 in November. This fluctuation could demonstrate that the checking process tends to decline over time and parent-monitors prefer to spend their time in their productive activities. Moreover, it appears that the diploma of recognition for the parent-monitors promised by the Ministry of Education was not motivating the parents to continue the process.

Graph 3 displays the average of teachers visited by parent-monitors taken from the last column of table 5. These percentages take into account only labour days when teachers have to teach as part of their regular job.



Graph 3: Average of teachers visited in labour days in 2004

As can be seen from Graph 3, the number of teachers that were visited by parent-monitors showed an upward trend almost all over the first semester (March to July). In July the number of teachers decreased reaching its bottom line in August with an average of 1210 teachers (58.04%). In September, the number of teachers peaked reaching its maximum with 1593.45 teachers, around 76.40% of the teacher population. However, in the next months the average of teachers displayed a gradual drop finishing the year with an average of 1423.28 teachers (68.28%).

In conclusion, it could be stated that the checking system of parents-monitors covered on average more than half of the population of teachers almost all months, even though it presented a large fluctuation during the year. Additionally, it is important to remark that the average of teachers visited took into consideration only labour days although some parents also monitored in weekend and holidays. This can illustrate the high level of compromise to their task demonstrated by parent-monitors. This high level of compromise can be explained because as Cueto & Alcazar (2004) declared the two major reasons for parents who decided to be parent-monitors were to increase the quality of education of their children, and to control and improve the attendance of teachers in their school. Additionally, the good performance of parent-monitors in doing the checking system could

reject the idea that teachers and headmaster²³ had about that parents-monitors could not fill the forms correctly since in rural areas most of the parents are illiterate and the format of the forms are too complicated for them.

Table 6 describes the average of days that parent-monitors of each school visited teachers. The maximum and minimum represent the extreme number of days that parent-monitors visited teachers in a certain school.

For a better understanding of the table it is necessary to remark that in the first semester the minimum number of days necessary to reach the goal (90% of possible checks) was 73 days ($73 \times 3 = 219$ checks) for a full-time teacher. In the second semester the minimum number of days needed for reaching the goal (95% of possible checks) was 71 days ($71 \times 3 = 213$ checks).

Table 6: Average of days that parent-monitors visited teachers

		First semester			Second semester		
		Average	Maximum	Minimum	Average	Maximum	Minimum
Comparison group	Ayacucho	44	75	2	78	88	11
Treatment group	Cusco	82	107	62	78	89	61
	Piura	80	103	22	78	91	48
	Puno	77	140	31	82	177	22
	San Martin	76	158	2	79	152	14
Treatment group media		M= 79.07, SD= 13.244			M=78.59, SD=11.652		
Mean difference ²⁴ between the comparison and treatment group		-34.721			-.878		
t-test		t= -16.659; d.f. =82.991; p=.000			t=-0.513; d.f.=82.184; p=.610		

As can be seen in Table 6, the average number of days that parent-monitors visited teachers in the departments of the treatment group was larger than the minimum required for reaching the goal in both semesters. In the first semester, the average of days that parent-monitors visited teachers in the treatment group is significant higher ($t=16.659$) than in the comparison group. However, in the second semester the difference in the mean of the treatment group and the comparison group is not significant ($t=-0.513$).

In the first semester, parent-monitors of the comparison group only visited teachers around half of the minimum days (44 days) necessary to reach the goal. However, the situation in the comparison group changed dramatically in the second semester when parent-monitors almost duplicated the number of days visited, 7 days ahead of the minimum number of days necessary to reach the individual goal. Moreover, in the first semester the maximum number of days visited in certain schools in the comparison group was slightly over (75 days) the minimum necessary to reach the goal. This could mean that only a few teachers could have the possibility to reach the individual goal in the comparison

²³ Results showed in the final report of the base line done by Cueto & Alcazar (2004).

²⁴ In the t-tests a negative t-value indicates an advantage for the treatment group comparing with the comparison group.

group in the first semester. This could have an impact on the number of teachers that reached the goal in the comparison group in the second semester.

Further analysis by department within the treatment group might reveal that parent-monitors of San Martin and Puno increased the number of days visited in the second semester with respectively 3 and 4 days more than in the first semester. On the other hand, the average numbers of days that parent-monitors visited teachers decline in Cusco and Piura with around 4 and 2 days respectively.

If we compare the results of Table 5 and Table 6 it can be observed that the increase in the number of teachers visited by parent-monitors in the last months of the second semester could be caused mainly by the increment of days in the comparison group, which almost double the number of days that parent-monitors visited teachers.

Focusing on the efficiency of the checking system, the number of days that the parent-monitors visited teachers was above the minimum required to reach the individual goal in the departments of the treatment group in both semesters. However, in Ayacucho the number of days visited in the first semester was very low comparing to the other departments which could make the gathering of data in this area difficult. This situation could be explained as a lack of motivation in the parent-monitors to implement and start on time the checking system in Ayacucho because their work would not have any consequence in the behaviour of teachers since the teachers would not receive any incentive or punishment.

Additionally, an explanation of the sharp increase of days visited in Ayacucho in the second semester could be because parents rely more on the system due to the regular visits of the staff of the Ministry of Education to the zone in order to consolidate the checking system and to clarify its rules and procedure. Another explanation may be that the parent-monitors and teachers heard about the incentive plan implemented in other regions and assumed that they would also be rewarded in the second semester. However, this last explanation has been dismissed by the staff of the Ministry of Education based on the regular visits to that area and informal talks with teachers and parents.

The number of teachers that were visited was also high almost all year, mostly in the second semester of the year when Ayacucho considerably increased the number of days that teachers were visited. In addition to this result, it is important to mention that the checking system tended to start late in most of the schools, shown by the low average of visited teachers in March. This delay could be explained by the fact that in the year 2004 classes started in March²⁵ for first time due to a policy dictated by the minister of education in order to increase the hours of teaching in public schools (1000 hours). Moreover, the drop in the checking system showed in September could be justified because the harvest time and most parents are usually farmers who have to go outside the community for weeks to work in their fields and can not work as parent-monitors.

To conclude, it can be stated from these results that the checking system was working well in the treatment group and facilitated the gathering of the data needed to reward teachers and schools.

²⁵ Classes used to start in the first week of April after three months of vacation for students.

6.2 How was the attendance of teachers in general?

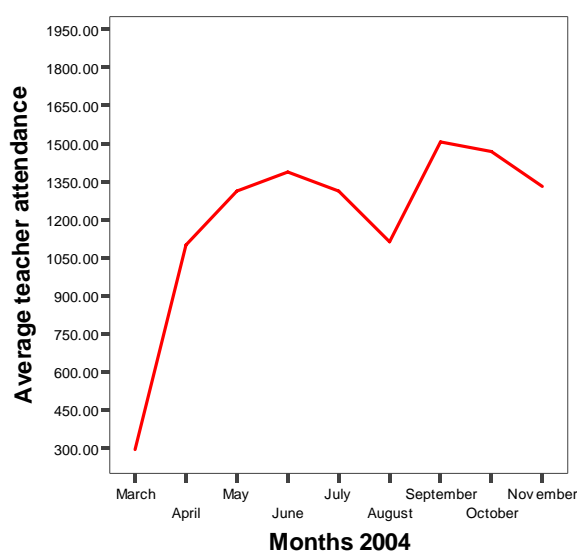
The second research question is related to the attendance of teachers in order to have a better idea of its distribution during the year 2004 and also to compare it with the distribution in the last months of 2003 when the incentive plan just started.

Table 7 describes the average of teacher attendance by month and the percentage comparing with the average of teachers that were visited in each month (information shown in Table 5) and teacher attendance comparing with the entire population.

Table 7: Average number of teacher attendance on labour days

Month		Average attendance (std. deviation)	Attendance of visited teachers ²⁶	Percentage of the population ²⁷
First semester	March	296.08 (454.64)	96.23%	14.20%
	April	1098.82 (336.47)	95.19%	52.70%
	May	1314.90 (79.88)	96.53%	63.06%
	June	1390.86 (254.09)	95.51%	66.71%
	July	1316.00 (205.91)	93.90%	63.12%
Second semester	August	1112.64 (475.03)	91.94%	53.36%
	September	1504.63 (41.53)	94.42%	72.16%
	October	1467.05 (225.83)	94.63%	70.36%
	November	1333.45 (351.35)	93.66%	63.95%

Additionally, the same data presented in the table 7 is shown in graph 4 for better understanding.



Graph 4: Average teacher attendance in labour days 2004

²⁶ The percentage of teachers visited was calculated dividing the average attendance over the average number of teachers that were visited each month (table 6).

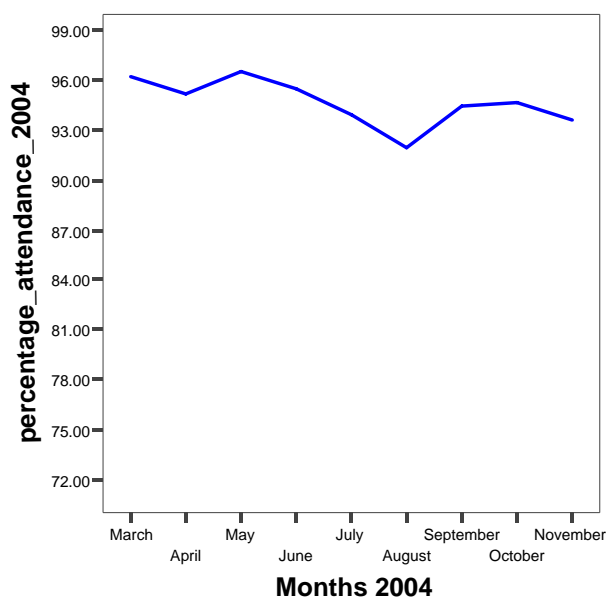
²⁷ The percentage of the population was calculated dividing the average attendance over the population number (2080).

As can be seen in Graph 4 and Table 7, the average of teacher attendance showed a great variation during the year. Similarly with the distribution of the checking system, at the beginning of the first semester the teacher attendance tended to increase until June when it dropped reaching an average of 1316 teachers in July (93.90% of teachers visited).

The second semester started after the holidays on August 9th until the end of November²⁸. During August, the attendance continued falling, followed by a recovery, reaching its peak in September with an average of 1504 teachers. This increment was followed by a drop in October and November finishing the year with 1333 teachers (93.66%).

Additionally, to interpret these results correctly it is important to focus also on the percentage of attendance (graph 3) that gives us a better idea of the relationship between the attendance and the number of teachers visited by the parent-monitors.

Graph 5 shows the distribution of the percentage of the attendance of teachers that were visited by parent-monitors during the year 2004.



Graph 5: Attendance of visited teachers in 2004

According to Graph 5, the percentage of teacher attendance showed a slight fluctuation during the year, getting its maximum in May (96.53%) followed closely by March (96.23%) and reaching its lowest point in August with 91.94%.

In regards of the high percentage of teachers visited (Table 7) it could be presumed that teachers tended to attend more in the schools where teachers were visited because parents, as representative of the community, were supervising and closely observing their work. This phenomenon could be

²⁸ It is necessary to state that December was not included in the analysis because the checking process finished at the end of November when the forms were collected by the staff of Ministry of Education.

explained by the Hawthorne effect (explained in the section 5.2.6) where the checking system by itself positively influences the attendance of teachers. In other words, regardless of receiving a reward or not, the attendance of the teachers seemed to improve. Apparently teachers were pleased to receive attention from the parents and from the Ministry of Education in the visits of the project staff.

Additionally, due to the decline of the percentage of teacher attendance in the second semester, it might be presumed that since the checking system was better in the last months of the year, it gave a better idea of the attendance of teachers. In other words, the percentage of attendance decreased because the checking system was more effective in the last months of the year in detecting irresponsible teachers.

6.2.1 Teacher attendance in 2003 and 2004

In addition to the analysis made above, it is also necessary to look at the attendance of teachers in 2003 in order to dismiss any particular situation in this last year (2004) which could affect the results found in 2004.

To do this analysis the last three months of 2003 were taken when the incentive plan just started. It is important to observe that in 2003 there was a big strike of the public teachers that lasted around a month, from the 12th of May to the 11th of June that could affect the teacher attendance in that year. Because the Ministry of Education ordered to compensate the time lost during the strike, teachers had to work on weekends and holidays and if they could finish the subject they should also teach in summer vacation. This situation made most of the teachers rush at the end of the year to finish all the subject contents in order to avoid working during the holidays.

Table 8 shows us the average of teachers that have been visited by parent-monitors as part of the pilot project and the percentage of teacher attendance comparing with the teachers visited by parent-monitors in the last three months of 2003 and 2004. It is also important to remark that as in Table 6, only the official labour days have been taken (Monday to Friday) discounting weekends, holidays and festivities, even though some teachers went to work on those dates.

Table 8: Average of teacher attendance in the last three months of 2003 and 2004

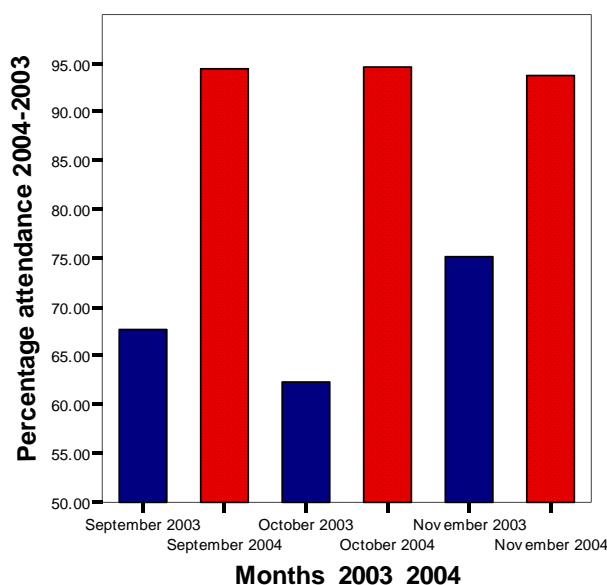
Month/Year	2003			2004		
	Average of teachers visited	Average teacher attendance (std. deviation)	Percentage teachers visited	Average of teachers visited	Average teacher attendance (std. deviation)	Percentage teachers visited ²⁹
September	1701	1151.50 (30.41)	67.70%	1593.45 (20.41)	1504.63 (41.53)	94.42%
October	1701	1058.44 (405.54)	62.22%	1550.29 (202.72)	1467.05 (225.83)	94.63%
November	1554	1168.80 (547.52)	75.21%	1423.68 (328.12)	1333.45 (351.35)	93.66%

²⁹ This percentage comes from table 5

As can be seen in Table 8, the percentage of attendance per month in 2003 was lower than in the same months of 2004, even though the number of teachers visited by the parent-monitors were higher than in 2004 (see Table 5). This could indicate that the attendance in the last three months of 2004 was more than in the same months in 2003 due to the consolidation of the project in the schools.

Additionally it can be observed that the standard deviation (std. deviation) of the average teacher attendance was high in October and November in both years, showing a high fluctuation in the attendance of teachers by schools and departments especially in these two months.

Graph 6 compares the percentage of teacher attendance in the last three months of 2003 and 2004 described in table 8. The dotted columns correspond to the last months of 2004 and the planed colour columns to the last months of 2003.



Graph 6: Percentage of the teacher attendance 2003-2004

In regards of the results showed in graph 6, it can be assumed that in 2003 the absenteeism rate in the schools where parent-monitors visited teachers was higher than in 2004. In other words, the attendance of teachers in 2004 was higher than in the same last three months in 2003 even though the average of teachers that were visited in 2003 (Table 8) was higher than in 2004.

6.3 Did the monetary and non-monetary incentive plan increase the number of hours that teachers spend with their pupils in the treatment group comparing with the comparison group?

The third research question is related to the effectiveness of the incentive plan and to letting us knows if, as Jacobson (2001) found in his research, the monetary and non-monetary awards increased the number of hours that teachers spent with their pupils.

For a better understanding of the table below it is necessary to state some remarks about the individual goals and how they have changed over the year 2004. In the first semester of 2004 the individual goal was the same as the one used in 2003; to obtain the monetary bonus a teacher had to reach 90% of the possible checks (219 checks for a full-time teacher). For the second semester of 2004 the goal increased to 95% of the total checks possible (213 checks for a full-time teacher). Moreover it is important to highlight that the first semester includes 85 days of classes beginning on March 15th until July 23rd, and the second semester includes 75 days beginning on 9th August until 30th November. December was not included in the incentive plan because the last forms were collected by the Ministry of Education staff in the first days of that month.

Table 9 describes the number and percentage of teachers that reached the individual goal in the departments of the two groups, the comparison and treatment groups. It also shows the results of the t-test in order to determine if the difference amongst the two groups is significant or not.

Table 9: Number and percentage of teachers that reach the individual goal by department in the first and second semester of 2004

		2004			
		First semester (90%)		Second semester (95%)	
Comparison group	Ayacucho	1	.3%	175	57.6%
Treatment group	Cusco	201	54.8%	216	58.9%
	Piura	337	61.1%	381	69.0%
	Puno	219	51.1%	289	68.0%
	San Martin	210	48.1%	280	64.1%
Total		968	46.4%	1341	64.3%
Treatment group percentage		54%		65%	
Percentage difference between the comparison and treatment group		-54%		-7.9%	
t-test		t=-18.86, p=.000		t= -2.662, p=.008	

The t-test showed that in the first semester the difference in the percentage of teachers that reached the individual goal between the comparison and treatment groups was significant ($t=-18.86$). Additionally, in the second semester the difference in the percentage of teachers that reached the individual goal between the comparison and treatment groups was also significant ($t= -2.662$).

From the statistics it can be concluded that in general the percentage of teachers that reached the individual goal by the first semester was around half of the whole population of teachers (2085) and increased by around 18% in the second semester. Moreover, making an analysis by groups it can be observed that in both semesters the percentage of teachers that won the individual award in the comparison group was fewer than in the treatment group, although the difference was much larger in the first semester. The low percentage of teachers that reached the individual goal in Ayacucho in the first semester is mostly likely because of the low attendance of teachers, but as can be seen in Table 6, because of the deficient checking system in this department in the first semester.

Additionally it can be seen that in the comparison group only one teacher could reach the goal in the first semester. However, this situation changed noticeably in the second semester when about half of the teachers (57.6%) belonging to the comparison group reached the individual goal. On the other

hand, in the treatment group, in almost all the departments around half of the teachers reach the individual goal with the exception of Piura which was more than 10% above the 50%. Furthermore, every department of the treatment group increased the percentage of teachers that won the individual award in the second semester by around ten percent, exceeding half of the population.

Concerning the percentage of each department and its change by semester, it can be noticed that San Martin had the lowest percentage of teachers that won the award in the first semester, but this situation changed for the second semester increasing the attendance by 16%. In the second semester, Cusco has the lowest percentage of winners in the treatment group, being less than one point over the comparison group.

Based on these results it can be deduced that the incentive plan was working well. The attendance of teachers in rural areas increased and the goals were perceived as a motivator for teachers to change their attendance behaviour.

In addition to Table 9, Table 10 shows the average of checks by semester. In this point, it is necessary to remember that each teacher can receive a maximum of three checks per day and that the incentive goal was counted not by days of attendance but by number of checks. For instance, in the first semester the maximum number of checks was 255 (85 days x 3, not taking into account weekends and holidays) and a teacher that works 5 days a week could win the award with a minimum of 219 checks. In the second semester the maximum number of checks possible was 225 (75 days x 3, not taking into account December, weekends and holidays) and the goal could be reached with 213 checks for a teacher working 5 days a week. It is also important to remark that the goal changes according to the number of days that the teachers have to work per week, i.e. the goal (number of checks) decreases by the increasing number of work-days³⁰.

Table 10: Average number of checks by semester

		2004	
		First semester Max 255, goal 219	Second semester Max 225 goal 213
Comparison group	Ayacucho	99	190
	Cusco	195	194
Treatment group	Piura	191	190
	Puno	182	205
	San Martin	194	215
Treatment group mean		190.56	200.31
Mean difference between the comparison and treatment group		-91.08	-10.02
t-test		t=-20.48, p=.000	t=-2.551, p=.011

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Work-days per week	Number of checks needed to reach the goal	
	First semester	Second semester
5 days	219	213
4 days	183	171
3 days	138	129
2 days	93	87
1 day	45	42

The t-test evidences that in both semesters the difference in the mean of checks between the comparison and treatment groups of teachers was significant (first semester: $t=-20.48$, second semester: $t=-2.551$).

As we can see in Table 10, in general the average of checks could not reach the minimum number needed to reach the goal in both semesters. However, can be seen an increase of around 20 points in the second semester in almost all the departments. The more notorious increment can be observed in the case of Ayacucho which duplicated the number of checks in the second semester and also the number of teachers that reached the goal. As was stated before, the lack of teachers that reached the goal in the first semester could be explained by the late start of the checking system in Ayacucho due to the fact that parents were not motivated to implement the system because their work would not have any consequence in the behaviour of teachers because teachers would not receive any incentive unlike teachers from the treatment group.

Further analysis also reveals that in Cusco and Piura the average of checks obtained by the teachers in the second semester tended to slightly reduce but the percentage of teachers that reached the goal increased. This peculiar situation can be explained because these departments have the biggest number of teachers (21.6%) that work only four days a week whose goal was 171 checks. Also in those departments the effectiveness of its checking system carried out by parent-monitors declined in the second period (see Table 6). In contrast, Puno and San Martin obtain the highest percentage of teachers that reached the goal and at the same time were the departments where the checking system was more effective in both semesters.

On the basis of a comparison between Table 7 and Table 10 it could be presumed that the individual incentive plan had a positive impact on increasing the attendance of rural teachers since the percentage of teachers who reached the goal in the treatment group was larger than in the comparison group, mainly in the first semester. Moreover, comparing Table 6 and Table 9 it can be suggested that there was a positive correlation between the numbers of days visited by parent-monitors and the percentage of teachers that reached the individual goal.

Additionally, Table 9 shows us that the average of checks was not too high, so teachers who reached the goal almost obtained the exact number of checks necessary to win the award. This result might demonstrate that the goal in the first and second semester could be working as a motivator for teachers to increase their attendance and it was perceived as a challenge (valence) since reaching the goal was not an easy task and they had to apply effort in changing their attendance behaviour.

6.3.1 Schools and teachers variables

For further analysis some school context variables have been incorporated such as level of education, type of school, language and distance; and teacher variables such as gender and age in order to see if there is any difference in the percentage of teachers that reach the individual goal in 2004 when one of each variable is controlled.

Table 11 shows the percentage of teachers that reached the individual goal by level of education in both semesters.

Table 11: Percentage of teachers that reached the individual goal by level of education in 2004

		Kindergarten		Primary		Secondary	
		First semester	Second semester	First semester	Second semester	First semester	Second semester
Comparison group	Ayacucho	.0%	41.7%	.0%	55.3%	1.4%	69.4%
Treatment group	Cusco	57.6%	75.8%	55.1%	62.5%	53.4%	47.5%
	Piura	62.7%	72.5%	67.2%	71.4%	50.8%	64.2%
	Puno	75.0%	56.3%	59.4%	65.1%	39.4%	72.8%
	San Martin	57.1%	61.9%	56.1%	70.1%	18.1%	45.7%
Total		52.4%	64.5%	50.0%	65.8%	38.1%	61.5%
Treatment group percentage		61%	68%	60%	68%	43%	61%
Percentage difference between the comparison and treatment group		-61.3%	-26.6%	-59.0%	-12.5%	-41.2%	-8.9%
t-test		t=-6.124, p=.000	t=-2.422, p=0.022	t=-17.60, p=.000	t=-3.500, p=.000	t=-7.031, p=.000	t=1.470, p=0.142

The t-test tells us that in the first semester the difference in the percentage of teachers that reached the individual goal between the comparison and treatment groups was significant in all levels of education (kindergarten: $t=-6.124$; primary: $t=-17.60$, secondary: $t=-7.031$). In the second semester, the difference in percentage of teachers that reached the individual goal between the comparison and treatment groups was significant only in kindergarten ($t=-2.422$) and primary education ($t=-3.500$). In secondary schools in the second semester the percentage of teachers that reached the individual goal between the comparison and treatment groups was not significant ($t=1.470$).

As can be observed from the table, in Ayacucho the majority of secondary teachers reached the goal in the second semester (69.4%), followed by primary teachers (55.3%).

In the treatment group, the tendency was an increase of the percentage by the second semester in all levels of education. However, at kindergarten level, Puno reduced the percentage by around 20% in the second semester. In secondary the percentage of teachers that won the award in Cusco decrease by around 6%. Furthermore, San Martin and Piura in the second semester obtained a percentage of 25% and 5% respectively behind the one obtained by the comparison group.

Primary education showed the highest percentage of teachers that reached the goal, followed by kindergarten teachers and they increased in the second period. Let's remember that almost all primary school teachers work 5 days a week, therefore apparently primary teachers are most likely to win the award and have less absences than teachers from other levels of education. In addition, secondary school teachers that tend to have a part-time job (less than 5 days a week) show the lowest percentage of teachers that reached the goal in both semesters.

Table 12 displays the percentage of teachers that won the individual award by type of school. In this point it is interesting to remark that "unidocente" schools are in most cases located very far away from

the capital of the province and the teachers tend to live in the community and only go to the capital to collect his/her pay check, for visiting his/her family or for administrative arrangements once every month or every two months for a week, leaving the students without any classes.

Table 12: Percentage of teachers that reached the individual goal by type of school in 2004

		Unidocente		Polidocente Multigrado		Polidocente completo	
		First semester	Second semester	First semester	Second semester	First semester	Second semester
Comparison group	Ayacucho	.0%	48.4%	.0%	51.4%	.6%	63.3%
Treatment group	Cusco	65.2%	65.2%	48.0%	75.6%	57.5%	48.9%
	Piura	60.8%	73.5%	66.2%	68.2%	57.1%	67.9%
	Puno	75.0%	100.0%	69.3%	56.8%	46.5%	70.6%
	San Martin	43.5%	45.7%	50.4%	63.0%	47.7%	68.0%
Total		48.5%	63.1%	49.0%	64.2%	44.7%	64.6%
Treatment group percentage		57%	66%	59%	67%	52%	65%
Percentage difference between the comparison and treatment group		-57.1%	-17.3%	-58.6%	-15.3%	-51%	-1.5%
t-test		t=-6.398, p=.000	t=1.767, two tailed p=0.066	t=-12.30, p=.000	t=-3.040, p=0.002	t=-13.11, p=.000	t=0.380, p=0.704

The t-test reveals that in the first semester the difference in the percentage of teachers that reached the individual goal between the comparison and treatment groups was significant in all types of schools (unidocente: $t=-6.398$; polidocente multigrado: $t=-12.30$, polidocente completo: $t=-13.11$). In the second semester, the percentage of teachers that reached the individual goal between the comparison and treatment groups was significant only in unidocente schools ($t=1.767$) and in polidocente multigrado schools ($t=-3.040$). But, the percentage of teachers that reached the individual goal between the comparison and treatment groups was not significant in polidocente completo schools ($t=0.380$) in the second semester.

On the basis of the results shown in table 8, one could state that the incentive program had more impact on “unidocente” and “polidocente multigrado” schools, where the difference of percentage of teachers that reached the individual goal among the comparison and treatment group in the second semester was higher.

As was expected, “unidocente” schools obtained the lowest percentage of teachers that reached the goal in both semesters; however the difference among types of schools was not large. In this respect, there were some interesting cases that are important to highlight such as Puno that despite of the critical living conditions in this department, more teachers in “unidocente” schools won the award, reaching all of the teachers in the second semester. In contrast, San Martin obtained the lowest percentage of teachers that reached the goal, also behind the comparison group in the second semester.

“Polidocente multigrado” schools are the second highest in percentage of teachers who won the award in the second semester and the highest in the first semester. Further analysis reveals to us that Puno was the only department where the percentage of teachers decreased in the second semester, in contrast to what happened in the “unidocente” schools in the same department.

Finally in “Polidocente completo” schools in general more teachers reached the individual goal. This situation is expected because “polidocente completo” schools are mostly located in the capital of the provinces and teachers live near the school, so they do not have any transportation problems. However, Cusco showed a lower percentage of teachers that reached the goal than Ayacucho in the second semester.

Table 13 describes the percentage of teachers that won the individual award by distance of the school from the capital of the province. As was stated before, the most remote schools (more than 5 hours) from the capital of the province present the hardest living conditions for teachers and they are located in the poorest and isolated areas.

Table 13: Percentage of teachers that reached the individual goal by distance from the capital of the province in 2004

		<2h		2-5h		>5h	
		First semester	Second semester	First semester	Second semester	First semester	Second semester
Comparison group	Ayacucho	.6%	59.1%	.0%	57.7%	.0%	25.0%
Treatment group	Cusco	58.6%	47.4%	56.2%	52.4%	49.6%	76.0%
	Piura	68.8%	72.9%	59.6%	67.4%	58.6%	72.9%
	Puno	53.4%	77.0%	45.9%	47.4%	77.8%	88.9%
	San Martin	51.1%	69.7%	44.4%	55.6%	36.5%	43.2%
Total		46.4%	67.4%	45.9%	59.8%	47.9%	65.9%
Treatment group percentage		55%	69%	55%	60%	49%	67%
Percentage difference between the comparison and treatment group		-54.4%	-9.9%	-55.5%	-2.6%	-49.3%	-42%
t-test		t=-13.75, p=.000	t=-2.445, p=0.015	t=-13.04, p=.000	t=-0.568, p=0.571	t=-2.779, p=0.006	t=-2.531, p=0.037

The t-test told us that in the first semester the difference in the percentage of teachers that reached the individual goal between the comparison and treatment groups was significant in all distances from the capital of the province (<2h: $t=-13.75$, between 2 and 5h: $t=-13.04$, >5h: $t=-2.779$). Nevertheless, the difference in the percentage of teachers that reached the individual goal between the comparison and treatment groups was significant only in schools located less than 2 hours from the capital of the province ($t=-2.445$) and in schools located more than 5 hours from their capital ($t=-2.531$). In schools located between 2 and 5 hours in the second semester the difference in percentage of teachers that reached the individual goal between the comparison and treatment groups was not significant ($t=-0.568$).

Contrasting the treatment and the comparison group it can be seen that the percentage of teachers that were rewarded in Ayacucho was similar to the one obtained by the departments of the treatment group

in the second semester. However, in the group of schools located more than 5 hours from the capital of the province, the percentage in Ayacucho was much lower than the departments belonging to the treatment group. This difference could reveal that the incentive plan and rewarding for attendance are having more impact on teachers that work in remote schools.

Breaking down the results by departments, it can be observed that in the first group (less than 2 hours) Cusco obtained a percentage which was around 12% lower than the comparison group. Furthermore in the second group (between 2 and 5 hours), Cusco, again Puno and San Martin reached a lower percentage of teachers that won the individual award comparing with Ayacucho. As was stated above, in the last category (more than 5 hours) Ayacucho obtained the lowest percentage with a difference of around 20% less than San Martin, the lowest in the treatment group.

Table 14 summarizes the percentage of teachers that reached the individual goal by language spoken in the community where the school is located. Aymara was not included in the statistics because Puno was the only department where this language was spoken. Piura is also not shown in the table because its whole population speaks Spanish.

Table 14: Percentage of teachers that reached the individual goal by language in 2004

		Spanish		Quechua	
		First semester	Second semester	First semester	Second semester
Comparison group	Ayacucho	.6%	55.2%	.0%	60.4%
Treatment group	Cusco	53.3%	48.3%	55.5%	64.0%
	Puno	42.3%	71.4%	57.1%	62.1%
	San Martin	47.4%	64.0%	57.7%	65.4%
Total		47.1%	64.6%	43.6%	62.6%
Treatment group percentage		53%	66%	56%	63%
Percentage difference between the comparison and treatment group		-52.5%	-10.7%	-56.3%	-2.8%
t-test		t=-13.48, p=.000	t=-2.705, p=0.007	t=-13.36, p=.000	t=0.595, p=0.553

The t-test showed that in the first semester the difference in the percentage of teachers that reached the individual goal between the comparison and treatment groups was significant in all languages (Spanish: $t=-13.48$, Quechua: $t=-13.36$). In the second semester, the difference in percentage of teachers that reached the individual goal between the comparison and treatment groups was significant only in Spanish schools ($t=-2.705$). However, the difference in the percentage of teachers that reached the individual goal between the comparison and treatment groups was not significant in Quechua schools ($t=0.595$) in the second semester.

As can be seen in Table 14, almost all the departments of the treatment group obtain a higher percentage of teachers that won the award in both semesters than the comparison group. Additionally in the second semester the percentage difference between the comparison and treatment group is

larger in the Spanish group. This result could be evidence of the incentive program having more impact on Spanish schools than in Quechua schools. However, in the second stage the Spanish schools in Cusco that is predominating bilingual and have more bilingual-teaching programs (84.6% of the schools) and where teachers usually are more integrated in the community because they speak the same language, reached a lower (around 7%) percentage of teachers than the comparison group.

Table 15 displays the percentage of teachers that receive a monetary award by the gender of the teachers.

Table 15: Percentage of teachers that reached the individual goal by gender in 2004

		Female		Male	
		First semester	Second semester	First semester	Second semester
Comparison group	Ayacucho	0%	54.1%	0.5%	59.9%
Treatment group	Cusco	51.5%	63.1%	56.5%	56.5%
	Piura	62.8%	71.1%	58.9%	66.5%
	Puno	53.1%	59.9%	50.7%	72.3%
	San Martin	50.7%	63.6%	45.6%	64.5%
Total		48.5%	64.1%	44.8%	64.5%
Treatment group percentage		56%	66%	53%	65%
Percentage difference between the comparison and treatment group		-55.9%	-11.6%	-52.4%	-5.4%
t-test		t=-12.43, p=.000	t=-2.492, p=0.013	t=-14.13, p=.000	t=-1.398, p=0.162

The t-test reveals that in the female group the difference in the percentage of teachers that reached the individual goal between the comparison and treatment groups was significant in both semesters (first semester: $t=-12.43$ and second semester: $t=-2.492$). In the male group, the difference in percentage of teachers that reached the individual goal between the comparison and treatment groups was significant in the first semester ($t=-14.13$). But, in the case of the second semester the difference between the treatment and comparison groups was not significant ($t=-1.398$) in the male group.

As can be observed from the table above, the percentage of females is generally higher than the percentage of males reaching the goal in both semesters. These results could evidence that the individual bonus might have more influence on female teachers although males are the majority in rural areas.

Table 16 presents the distribution of teachers that won the individual award by group of age.

Table 16: Percentage of teachers that reached the individual goal by age in 2004

		<25		25-36		37-48		49+	
		First semester	Second semester	First semester	Second semester	First semester	Second semester	First semester	Second semester
Comparison group	Ayacucho	0%	0%	0%	50.0%	0%	71.4%	1.9%	66.7%
Treatment group	Cusco	.0%	0%	46.6%	61.0%	66.0%	63.6%	59.7%	59.7%
	Piura	12.5%	25.0%	59.1%	72.1%	75.4%	81.1%	65.5%	67.2%
	Puno	0%	0%	49.8%	67.1%	58.2%	76.5%	61.0%	70.7%
	San Martin	0%	25.0%	48.0%	65.5%	69.1%	82.9%	58.1%	80.6%
Total		5.9%	25%	45.9%	66.3%	58.6%	75.7%	48.4%	67.5%
Treatment group percentage		6%	25%	52%	67%	56%	64%	67%	68%
Percentage difference between the comparison and treatment group		-6%	-25%	-51.5%	-17.2%	-55.9%	-5.3%	-59.6%	-1%
t-test		t=-.243, p=.812	t=-.542, p=.596	t=-9.664, p=.000	t=-3.210, p=0.001	t=-14.26, p=.000	t=-1.283, p=0.200	t=-8.868, p=.000	t=-0.143, p=0.887

The t-test showed that in the first semester the difference in the percentage of teachers that reached the individual goal between the comparison and treatment groups was significant in all teacher ages (25-36: $t=-9.664$, 37-48: $t=-14.26$, over 49: $t=-8.868$), except in the youngest group of teachers ($t=-.243$). In the second semester, the difference in percentage of teachers that reached the individual goal between the comparison and treatment groups was significant only in the group of teachers between 25 and 36 years old ($t=-3.210$). However, the percentage difference between the comparison and treatment groups was not significant in the groups of teachers with less than 25 years old ($t=-.542$), between 37 and 48 years old ($t=-1.283$) and over 49 years old ($t=-0.143$) in the second semester.

As can be seen in Table 16 the age range with more teachers that reached the goal was the group between 37 and 48 years old with more than 10% in the first semester and 7% in the second comparing with the second high category (49 and more years old). However the percentage difference between the comparison and treatment group is larger in the group of teachers between 25 and 36 years old. This result could reveal that the individual incentive system was having more impact on the middle age teachers who tend to work with a contract and their positions for the next academic year depend on their performance and the decision of the regional office of education.

To summarize the results shown previously in the different tables, the incentive program appears to have more impact on female and kindergarten and primary teachers, in the middle age (25-36 years old) group of teachers, in remote schools (more than 5 hours from the capital of the province), in Spanish schools and in “unidocente” and “polidocente multigrado” schools.

6.3.2 Comparing 2003 and 2004

The following tables display a comparison between the teachers that won the individual award and the schools that reached the institutional goal in 2003 and 2004. The total number of teachers in 2003 was 1966 and in 2004 there were 2085 teachers.

Table 17: Number and percentage of teachers that reached the individual goal in 2003 and 2004

		Number of teachers	Percentage
2003	September-November (90%)	1294	65.8%
2004	First Semester (90%)	968	46.4%
	Second semester (95%)	1341	64.3%

Table 17 illustrates that the number of teachers that reached the goal increased comparing the last three months of 2003 with the second semester of 2004, even though the percentage in the second semester of 2004 is slightly lower than in 2003. The percentage of teachers that won the award in 2003 (65.8%) was higher than in both semesters of 2004, mainly in the first stage when the difference was almost 20%. These results could reveal that the incentive project was working better especially in the last months of the year when, as Table 7 shows, the attendance of teachers tended to increase. This increment of attendance could be explained by the fact that teachers at the end of the year try to finish all the content planned for that year and increase the hours of classes.

Table 18 displays the percentage of teachers that reached the individual award by departments in year 2003 and 2004.

Table 18: Percentage of teachers that reached the individual goal in 2003 and 2004 (by semester)

		Individual goal		
		2003	2004	
			First semester	Second semester
Comparison group	Ayacucho	19.0%	0.3%	57.6%
	Cajamarca	1.1%		
Treatment group	Cusco	66.8%	54.8%	58.9%
	Piura	92.6%	61.1%	69.0%
	Puno	96.2%	51.5%	68.0%
	San Martin	71.6%	48.1%	64.1%
Total		65.8%	46.4%	64.3%

It could be shown from Table 18 that in 2003 there was a substantial difference between the control and the comparison group in the percentage of teachers that reached the individual award. This situation continued in the first semester of 2004 followed by a dramatic rise in the comparison group in the second semester which made the difference smaller. Further analysis reveals that in all the departments of the treatment group the percentage of teachers that won the individual award decreased in 2004.

Table 19 displays the percentage of schools that reached the institutional award in 2003 and 2004. At this point it is necessary to clarify that in addition to the individual award, the incentive plan included a group award where the principal could win a bonus if 80% of the teachers that work in a school reach the individual goal. The group award only included schools with more than one teacher, in other words “unidocente” schools can not participate in this kind of incentive because a teacher can not receive a double bonus. Therefore for the institutional award only 444 schools could participate in 2003 and 316 schools in 2004.

Table 19: Number and percentage of schools that reached the institutional goal in 2003 and 2004

		Number of schools	Percentage
2003	September-November	315	70.6%
2004	First Semester	121	38.3%
	Second semester	199	63.0%

As can be seen from Table 19, like the individual incentive, the percentage of teachers that receive the institutional award in 2003 was higher than in 2004, mostly in the first semester. Additionally, unlike in 2003, in 2004 the percentage of schools that reach the group award was slightly lower than the percentage of teachers that reached the individual goal.

Table 20 illustrates the percentage of teachers that reached the school-based award by department in the years 2003 and 2004.

Table 20: Percentage of schools that reached the institutional goal in 2003 and 2004

		Institutional goal		
		2003	2004	
			First semester	Second semester
Comparison group	Ayacucho	17.5%	0%	55.3%
	Cusco	74.4%	33.3%	64.9%
Treatment group	Piura	92.9%	53.7%	63.2%
	Puno	94.7%	43.1%	58.8%
	San Martin	50.5%	43.9%	69.7%
Total		70.6%	38.3%	63.0%
Treatment group percentage			45%	64%
Percentage difference between the comparison and treatment group			-45%	-9%
t-test			t=-6.179, p=.000	t= 1.139, two tailed p=0.259

The t-test reveals that in the first semester the difference in the percentage of schools that reached the institutional goal between the comparison and treatment groups was significant ($t=-6.179$). However, the difference in percentage of schools that reached the institutional goal between the comparison and treatment groups was not significant ($t= 1.139$) in the second semester.

The lower percentage of schools that reach the institutional goal comparing with the percentage of teachers that reach the individual goal may suggest individual fluctuation within each school and not a work team. Moreover, this could imply that the institutional goal was not motivating teachers to work as a team in order to win the award. An explanation could be that due to the fact that the institutional award was only for the principal and not given in the form of school improvement funds or materials that can be shared between all the teachers in the school, it was not working as a teamwork motivator.

7 CONCLUSIONS

This part attempts to summarize the principal findings of the implementation of the merit-pay plan and school-based award system in rural schools. This section is divided in three parts according to the research questions displayed in the research design chapter 4. It starts with some conclusions about the implemented checking system of parent-monitors, followed by the attendance of teachers during 2004 and a comparison with the teacher attendance in 2003. Finally, the main results related with the individual and group award are presented.

7.1 Checking system

- a) The implemented checking system of parent-monitors shows as a first successful experience in giving the parents the responsibility of gathering the data needed to implement a teacher incentive plan. In addition, this project displayed as an innovative experience of a monitoring system in a decentralized way which works with members of the community instead of the staff of the Regional Educational Office (UGEL) who have demonstrated their inefficiency in monitoring and supervising school teachers, especially in rural areas.
- b) The checking system shows a high responsibility assumed by parent-monitors in collecting data, also during weekend and holidays. The number of days that parent-monitors visited teachers was ahead of the minimum required for reaching the individual goal in the department of the treatment group in both semesters. However, the system tends to start late and fluctuate during the year depending on the regular work of parent-monitors which had an important effect on the percentage of teachers that reached the goal in some departments.
- c) Making an analysis in the comparison group, it can be seen that in Ayacucho the number of days teachers were visited in the first semester were very low comparing to the other departments which could difficult the gathering of data in this area. The failure of the checking system in Ayacucho meant that only a few teachers had the possibility of reaching the individual goal in the comparison group in the first semester.

The low percentage of teachers that reached the individual goal in Ayacucho in the first semester could be not because of the low attendance of teachers, but could be due to the deficient checking system in this department in the first semester. This situation could be explained by a lack of motivation in the parent-monitors to implement and start on time the checking system in Ayacucho because their work would not have any consequence in the behaviour of teachers since the teachers would not receive any incentive or punishment.

However, the situation in Ayacucho changed dramatically in the second semester when parent-monitors almost double the number of visiting days. This sharp increase could be because parents rely more on the system due to the regular visits of the staff of the Ministry of Education to the zone consolidating the checking system and clarifying its rules and procedure. Another explanation may be that the parent-monitors and teachers heard about the incentive plan implemented in other regions and assumed that they would also be rewarded in

the second semester. However, this last explanation has been dismissed by the staff of the Ministry of Education based on the regular visits to that area and informal talks with teachers and parents.

7.2 Teacher attendance

- d) The attendance of teachers was high during the year in the schools where the parent-monitors system was implemented although it fluctuated within the months and within departments. It could be presumed that teachers tended to attend more in the schools where parent-monitors visited teachers because parents, as representatives of the community, were supervising and closely observing their work. This phenomenon could be justified by the Hawthorne effect. In this case the checking system by itself has positively influenced the attendance of teachers. In other words, regardless of receiving a reward or not, the attendance of the teachers seemed to improve. Apparently teachers were pleased to receive attention from the parents and from the Ministry of Education in the visits of the project staff.
- e) Comparing year 2003 and 2004 it can be stated that the incentive project was working better in 2004 especially in the last months of the year when the attendance of teachers tended to increase. This increment of attendance could be explained due to teachers at the end of the year trying to finish all the content planned for the year and increasing the hours of classes.

7.3 Individual goal

- f) According to the results it can be assumed that the individual incentive plan was having an impact on the attendance of the teachers because the percentage of teachers who reached the goal in the treatment group was higher than in the comparison group, mainly in the first semester. In addition, in both semesters of 2004 the percentage of teachers that won the individual award in the comparison group was lower than in the treatment group, although the difference was much larger in the first semester. Based on these results it could be alleged that the amount of the monetary bonus (between 5 and 10% of the average salary of a teacher) was perceived as a sufficient motivator for teachers to change their attendance behaviour.
- g) Summarizing the results when some school and teacher variables are manipulated, it can be seen that the merit-pay plan appeared to have more impact on female and kindergarten and primary teachers, in the middle age (25-36 years old) group of teachers, in remote schools (more than 5 hours from the capital of the province), in Spanish schools and in “unidocente” and “polidocente multigrado” schools.
- h) In general, full-time teachers (who work 5 days a week, the majority of teachers) had less opportunities to reach the individual goal because, on average, parent-monitors did not visit teachers the minimum number of days needed to win the award for a full-time teacher. However, an increase of around 20 days visited can be seen in the second semester in almost all the departments.

7.4 School-based award

- i) In 2004, the percentage of schools that reach the group award was slightly lower than the percentage of teachers that reached the individual goal. This result might suggest individual fluctuation within each school and not a work team of teachers oriented towards reaching the school-based award. This could imply that the institutional goal was not motivating teachers to work as a team in order to win the award. An explanation could be that due to the fact that the institutional award was only for the principal and not in the form of school improvement funds or materials that can be shared between all the teachers in the school, the school-based award was not working as a teamwork motivator.

8 RECOMMENDATIONS

This section makes suggestions for improving the current merit-pay plan and school-based award system implemented in rural schools in Perú.

8.1 Model of incentive plan

- a) Since there was a lot of critique and opposition from the educational community for implementing an incentive plan that rewards teachers for doing what they should do (attendance), the incentive pilot project made a proposal for rewarding rural teachers based on student achievement³¹.

Based on incentive plans developed in other developing countries, the proposal of the pilot project of implementing a merit-pay plan based on student achievement shows as an unviable solution since Perú doesn't have a broad evaluation of students. As McMeekin (2000) recommended, based on Chile's incentive experience, in order to lower the incremental cost of the information needed and make the evaluation system economically viable, a country needs a broad examination system that is already working and not to create a system only for the incentive purpose. This means that a country that has no system of testing that measures all schools (instead of a sample) would face both, the cost of developing the testing system and all the negotiation cost involved in establishing it and developing its credibility.

In addition, a successful implementation of an incentive system based on student achievement has to take into consideration the fact that some opportunistic behaviour of teachers can happen. As Murnane & Cohen (1986) claimed, some of these problems could for example be that teachers are tempted to select students and encourage weak pupils not to participate in "high stakes" learning assessment, help students during tests, or even worse, force students to repeat grades or even drop out in order to increase average scores on the exam. Also, if not all subjects are assessed, there is a risk that teachers spend more time and effort teaching the subjects being evaluated. Moreover, variation in the academic abilities of cohorts of students due to migration in rural areas or as a result of closing a school and students going to a new one can add to the stress on teachers, since these new students represent a part of student performance that teachers have little control over.

8.2 Type of rewards

- b) Based on the results from the school-based incentive it could be suggested that the monetary group award should not be given to the headmaster of the school but as a monetary bonus to the school since, as the results showed, the bonus to the headmaster did not motivate teachers to work as a team in order to reach the institutional goal. As Kelley (1999) suggested, the bonus could be divided within teachers in the school or invested in improving school inputs (educational materials, furniture, etc.) in coordination with the parent-monitors or the parent

³¹ Propuesta de diseño del plan piloto de incentivos por tiempo en el aula para docentes rurales 2004.

organization (APAFA). This additional bonus not only would motivate teachers to reach the goal but also would motivate parent-monitors to implement the checking system since the possibility that teachers and schools reach the goal depends on the effectiveness of the checking system and the work of parent-monitors.

- c) The pilot project could take into account the possibility of giving teachers another kind of incentive than a monetary bonus which could be less expensive and motivate more teachers to increase the attendance. As Miller & Swick (2001) recommended, an incentive plan should take into consideration not only a monetary bonus as a reward, but also use a variety of rewards by the community which can enhance the personal prestige of individual teachers whose achievements otherwise go unnoticed. In this line, winners can be announced on regional radio or published in the UGEL so teachers could be recognized and support by the community which might motivate them more than the bonus which is only known by the winners.
- d) Since most of the teacher attendance problems in the first months of the year are caused by the inefficient work of the educational region offices in placing teachers on time, an incentive program for these regional governmental organs could be helpful. In the school or group-based incentive plan it could be interesting to include an incentive to the educational regional educational office if a certain percentage of schools of its jurisdiction reach the institutional goal. In this way it could accelerate the placement of new teachers in the schools and improve the administrative procedures for hiring new teachers which are usually contracted for one year or less.

8.3 Goal

- e) Since the attendance of teachers tends to be less in the first months of the year, the goal of the first semester could be higher than in the second period since, as is shown in the results, the attendance of teachers during these last months of the years is already high.

8.4 Procedure

- f) Although the incentive program and the monetary award have showed as good motivators for increasing teacher attendance in rural areas, based on expectancy theory, it could be necessary to assure that teachers perceive a relationship between their effort and the receipt of a reward (clear goal). The monetary awards should not be included in the regular salary check deposit in their bank account, but as an independent pay check in order to assure that winners can easily realize that the extra money (the monetary bonus) comes from the incentive project and not from other funds or for doing other activities.
- g) Based on the administrative problems that the project faced in 2003 and 2004, a capital recommendation remarked by many researchers such as Murnane & Cohen (1986), Morduchowicz (2002), Murnane (1993), is having the necessary monetary funds to assure that all the teachers that reached the goal receive the monetary bonus on time. If this does not happen, the credibility of the project will be seriously damaged and the incentive could lose

all its motivational power to change the behaviour of teachers, in this case increasing teacher attendance.

- h) In order to decrease the opposition that the incentive pilot project has been facing from the teacher union (SUTEP), a consultation council could be organized which includes members of the school community to discuss the implementation of and changes made in the incentive program. As Odden & Kelley (1997); McMeekin (2000); Mizala & Romaguera (2004) recommend, to assure the success of an incentive plan for teachers the active participation of the different educational actor (teachers, students, headmaster, regional educational authorities and parents) is very important in every step of the process, including the design, or in this case redesign, implementation and the evaluation. In this way, there will be not only less opposition but also it could assure the implementation of a tailor-made incentive plan which is focused on the real needs of rural teachers.
- i) As can be seen in the results parent-monitors from the comparison group did not feel motivated to implement the checking system because they could not perceive their work had any consequence in the behaviour of teachers they would not receive any incentive. To solve this problem, parent-monitors (especially from Ayacucho) could receive an incentive for implementing the checking system. The incentive could be a non-monetary award for the community such as building material or working tools or some cloths (vests, sweaters, t-shirts or baseball caps) with the logo of the Ministry of Education for the comparison group and the logo of the project for the treatment group which identify them as parent-monitors and also give them status in the community.
- j) In order to assure that the checking system will start on time, it is necessary to start an advertisement process by regional radio or booklets around one month in advance of starting classes. This will not only assure that the process will start on time but also motivate parents to send their children to school and the regional educational office to hire teachers on time.

8.5 Research methodology

- k) In order to improve the incentive pilot project it is indispensable to evaluate the process and the ongoing results. In this line, it is necessary to evaluate the opinions of the participants (teachers, students, headmasters, community and regional authorities, etc.) about the incentive system and its impact on the educational practice of teachers and on the community in general. This research could be done during the monitoring visits of the staff of the Ministry of Education three times a year. This could help to implement an ongoing evaluation of the system and also to see how the opinion of the educational community changes over time.
- l) In addition, it could be interesting to evaluate the impact of the incentive project on the attendance of students by comparing the number of students in the class every three months with the number of students registered at the beginning of the year. This data could be gathered by the staff of the Ministry of Education as part of the monitoring task and not by parent-monitors since it is not necessary to collect the number of students each day.

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F4

Formulario 4: Recolección de Datos Diarios de Docentes

Nombre del Centro Educativo : _____ Departamento : _____
 Provincia : _____
 Código Modular : Anexo : SI NO Distrito : _____
 Fecha : 04
 Nivel : Inicial Primaria Secundaria Turno : M T Día planificado en el calendario SI NO

Nº	NOMBRES / APELLIDOS	ASISTENCIA			Asistencia alumnos
		Hora Entrada	Durante el día	Hora salida	
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4					
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Observaciones sobre el registro :

Copia del Coordinador de Monitores

Nombre y Firma del Monitor : _____



F5

Formulario 5: Ficha del Equipo de Monitores

Nombre del Centro Educativo : _____ Departamento : _____

Código Modular : Anexo : SI NO Provincia : _____

Nivel : Inicial Primaria Secundaria Turno : M T Distrito : _____

	Nombres y apellidos <small>Comience en la línea 1 con el Coordinador de monitores</small>	Sexo (H/M)	Edad	Horario de monitoreo						
				Lunes	Martes	Miércoles	Jueves	Viernes	Sábado	
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2										
3										
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5										
6										
7										
8										
9										
10										

[Marque una equis para los días que le toca monitorear]

Copia para el MED