

Because education is a fundamental element of our societies, many attempts have been made to increase the quality of teaching in primary and secondary schools. One of the ways in which this might be accomplished is by redesigning the compensation schemes of teachers. Describe some of the proposals that have been made in recent years and discuss the factors that may affect the choice of an optimal compensation plan (i.e. one that maximises the teachers' effort).

Word limit: 3000 words

This essay will aim at providing an in-depth overview of how, over the years, we have attempted to increase the quality of teaching in primary and secondary, state-owned and private, schools. The main focus regarding this attempt will lie with the proposals that have been made in order to maximise the teachers' effort regarding teaching. Additionally I will examine what factors may affect the choice of an optimal scheme in order to maximise teachers' effort. I will do this by comparing the various different plans that are already in place, in different countries, regarding their costs versus their results. First I will look at why education is so important, and why quality of teaching makes a big difference in this. Secondly I will say what improves the quality of teaching. Further I will compare the schemes that are already in place. Finally I will state why I think that rather than rewarding the teachers in extrinsic manner, I think we should focus on their intrinsic love for teaching and use that to further motivate them at maximising efficiency.

With an ever increasing population, developing countries and changing climate, education is a fundamental element of our societies; it is an important factor in making sure that we can make our world a better place for future generations. Education is the gain of knowledge through the accumulation of information. It forms us, and our children, and therefore it forms the society we live in. It refines the way we perceive everything around us and allows us to build opinions. Good education provides a better future.

Even though in 1966 the Coleman report¹ stated that family and background of students were of more importance than school and teachers, regarding students' achievements, it has now been proven that the quality of the school and its teachers do matter². Quality of teaching is essential for quality education; accordingly it is a fundamental aspect for quality knowledge.

¹ Coleman, James S. "Equality of educational opportunity." (1966).

² Kane, Thomas, and Staiger, Douglas "estimating teachers impacts on student achievement: an experimental evaluation" (2008)

Quality education is made up of different factors. Servqual³ defines the following determinants to be of uttermost importance:

- Tangibles: the presence of support services, personnel, facilities and equipment.
- Reliability: to what extent the knowledge and services are provided.
- Responsiveness: the ability and willingness to help students, and to do this effectively.
- Assurance: students being able to feel confident, safe and trusted in their institution.
- Empathy: how much care the educational system put into providing the best service.

The most important, for this essay, of the above mentioned is reliability: to what extent knowledge is provided through the quality of the teachers present. This resource variable relies on the training the teacher has received, the amount of the experience the teacher has obtained and the salary the teacher is receiving to teach. Additionally the proportion of teaching staff available and the ration of student's vs teaching staff is crucial⁴. The more teachers are present, the smaller the classes will be and the teachers will be able to focus more on the individual student rather than the class as a whole.

Maximising the effort of a teacher means that teachers will be motivated to push and encourage their students to explore the world, define themselves and accumulate knowledge. 'Great teaching leads to improved student progress'⁵, with the aim of securing the students future success. Attempts have been made to increase the effort teacher's put into teaching. Such attempts usually are based around a compensation scheme. A compensation scheme rewards teachers is based on the performance of the students. The bonus program used the model:

$$y_{jt} = \delta D_{jt} + X_{jt}\beta + \varepsilon_{jt}$$

Here, y is the total outcome, 'where y_{jt} is the outcome of interest for school j in year t , D_{jt} is an indicator selection into the bonus program's treatment group, X_{jt} is a vector of school characteristics, and ε_{jt} is an idiosyncratic error term.⁵ School observations are weighted by the number of tested students'⁶.

In 2007 such a group- incentive scheme was applied to two hundred high-poverty schools in the US. These schools could receive bonuses by surpassing student achievement based goals

³ Maria Tsinidou, Vassilis Gerogiannis, Panos Fitsilis, (2010) "Evaluation of the factors that determine quality in higher education: an empirical study", *Quality Assurance in Education*, Vol. 18 Iss: 3, pp.227 - 244

⁴ Hans Luyten, Jaap Scheerens, Adrie Visscher, Ralf Maslowski, Bob Witziers and Rien Steen at the University of Twente. "School Factors Related to Quality and Equity, based on results from PISA" (2000). P.12, 13, 32-41.

⁵ Robert Coe, Cesare Aloisi, Steve Higgins and Lee Elliot Major, "What Makes Great Teaching? Review of the Underpinning Research" (2014) p. 2.

⁶ Groupman and Turner, "The Design of Teacher Incentive Pay and Educational Outcomes: Evidence from the New York City Bonus Program" (2012) p. 5.

that were set out for them. The successful schools would receive a lump sum payment per teacher equal to roughly 3 to 7% of the teachers' annual salary⁷.

Positive aspects of this group incentive are that we are able to monitor the results of the teachers as a whole. This is positive because it is very difficult to oversee individual input. Additionally if we were to monitor each teacher individually it would be very expensive, the principal would have to invest in monitoring. But if the principal can observe e^* then he is able to give the agent a fixed amount.

The group incentive also encourages cooperation between teachers. Additionally the teachers could be placed in groups to encourage collective creative thinking and the monitoring of each other. This way the teachers can give each other advice and share what methods work best with the children. Nevertheless this could lead to (negative) sub-group competition.

Even though this increased the achievements of students in general, it also brought with it an amount of issues. First of all you need to be able to monitor worker input, and the actual change in output caused by this. This is a potential problem because the monitoring of teachers is very costly, especially when regarding teachers individually.

Secondly, because the payment scheme is awarded to teachers when student achievement increases (higher marks), the result of this could lead to the isolation of what the teacher places her effort on. In other words, the teacher would most likely solely focus on obtaining a higher average exam result for her students. The teacher will choose a level of e that will maximise her own payoff. This means that other classroom activities, such as debates and group work, would be less focused on, leading to a possible decrease of creativity⁸.

Thirdly, because the reward is offered to the schools as a lump sum payment, and because it is difficult and costly to monitor teachers individually, there could be a free rider problem. This is because the results are looked up on as a whole. If e is effort and Y is the total output, then this would be $Y = e_1 + e_2 = e_k$. The individual will only implement a level of e that will maximize her own utility⁹. Therefore, this could also lead to shirking, if teachers know that their colleagues are performing well, and obtaining good results regarding their students, the teacher might be tempted to not maximise effort because it expects to get the payment anyways, due to her colleagues performing well.

Besides this, Aaronson, Barrow and Sander found that even though there was this compensation scheme applied to the schools, there was little or no improvement in the results for maths and reading¹⁰.

⁷ Groupman and Turner, "The Design of Teacher Incentive Pay and Educational Outcomes: Evidence from the New York City Bonus Program" (2012) p. 3

⁸ Holmstrom, Bengt, and Paul Milgrom. "Multitask principal-agent analyses: Incentive contracts, asset ownership, and job design." *Journal of Law, Economics, & Organization* 7 (1991): 24-52.

⁹ Ludovica Giau, Lecture 5, "Economics of Organizational Management".

¹⁰ Daniel Aaronson, Lisa Barrow and William Sander "Journal of Labor Economics" Vol. 25, No. 1 (January 2007), pp. 95-135

Ultimately I think it is really good that the schools' students that were involved with this rewarding scheme received higher marks. Nevertheless I question whether this is what education is about. As I mentioned in second paragraph, even though education is definitely about gaining information and learning how to apply it, it surely is also about finding yourself, being creative and preparing for the future. I feel that such a compensation scheme takes away all creativity that should be present in education. If education becomes only about obtaining high marks then we might as well have robots teach us. Yet, education is about way more, for example the aspects that I mentioned above. Rather than pursuing to obtain high marks, we should reward teachers for motivating students to explore and discover, whilst learning.

A second proposal, found in a private school in Dubai, is a bonus system rewarded to the teachers according to a marking scheme. This whole bonus system was based around the children getting an average result of 70% in their classes. The larger percentage of children in the teacher's class that would get above 70% would result in a larger bonus for that teacher. To make sure that the children received a mark above 70%, the teachers offer weekly, private, helping classes, at no extra cost¹¹. Additionally the classes were small; they only contained 10 to 15 children each.

Even though this proposal might seem to cause for negative competition between teachers, Mahdi has confirmed that the teachers actually enjoyed working together on obtaining the best results and even took over each other's one-on-one support classes when necessary. The fact that the Muslim religion is about connecting and sharing is a major reason as to why there was no competition between the teachers.

This proposal is quite easy to monitor, as you are just looking at results above 70%. Because the effort is observable, actions are contractible and there is a possibility to align the interests of the agent and the principal. Additionally the employer can be compensated for her effort. The pay-performance link will also be strongest when the outcome is sensitive to effort, and when the risk aversion is low, like it is in this case.

Nevertheless this proposal also has bad consequences. Just like the first payment scheme I mentioned, this one also results in teachers concentrating their lessons on the vital information that will come up in tests. Mahdi stated that teachers would say: "don't learn that, it won't come up". This is negative because it limits the children's knowledge and the tests in this case do not properly test them as they already know what is going to come up.

Additionally, with the teachers solely focussed on obtaining an average mark of each student above 70%, creative thinking, self-exploration and character formation are all things that are left behind. Yet these aspects of teaching are also important, especially when children are young and developing.

¹¹ Mahdi Said. Ex private school pupil Dubai and family member to private school teacher Dubai.

Another proposal, similar to the first one, has been made with the ambition to persuade teachers to aggrandize their effort. This time the compensation scheme is awarded to teachers individually. If these rewards are based upon the benefits that the society would obtain through the students' knowledge (social returns), then we would not face the issue of loss of creativity. The teacher would base her decisions towards how she teaches based on how her effort will affect the society as a whole. An example of this could be that the teacher would really motivate the students and teach in a way that encourages students to develop, whilst keeping it fun. This way less students would drop out, benefitting the society as a whole.

The good thing about this scheme is thus that it aims at benefiting the society as a whole (social returns). The teacher's goal is to show the children that learning is fun. This can be done through showing the children how to apply their knowledge in real life situations. Additionally motivating the students to explore independently, creatively and theoretically will allow the students to develop in a mature way, with good character traits. By becoming a defined person, these students will have received the base of their characters through education. This will allow them to be good citizens and thus benefit their society through their good traits, but also through their knowledge.

Another positive aspect of this method of obtaining high levels of teacher effort is that it will most likely attract productive teachers.

Bad consequences could be the result of a negative form of competition between teaching colleagues. Additionally it could affect the agent-principle relationship. Because the reward scheme is rewarded to teacher's individual, this could result in it becoming competitionally based driven. This is a negative aspect because we would like to see teachers join forces (collaborate) in order to assure that teaching methods are discussed and improved upon.

The other negative aspects of this effort maximising principle are similar to the first scheme discussed. These include the cost and difficulty of actually tracking the teacher's individual effort.

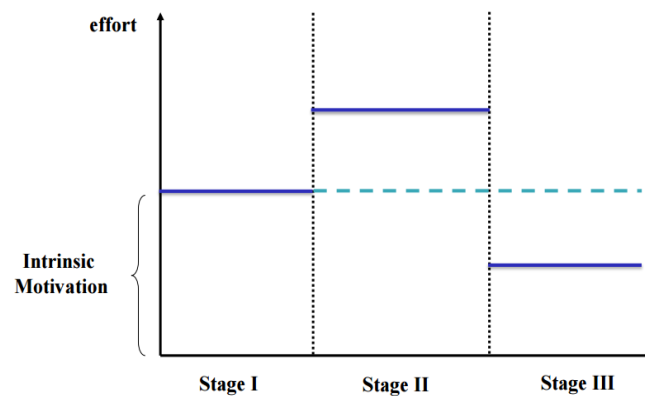
Aaron, Barrow and Sander also concluded that 'the variables that determine compensation in Chicago only explain 1% of the total variation of estimated teacher quality. This highlights the lack of close relationship between teacher pay and productivity'¹².

Chambers reported finding that teachers in public schools get paid higher salaries than those in private schools¹³. This could possibly be because the circumstances that teachers have to deal with in public schools are tougher than those in private schools. The extra salary could thus be a form of compensation to make up for the harder circumstances (less equipment, bigger classrooms, more students) they have to deal with.

¹² Daniel Aaronson, Lisa Barrow and William Sander "Journal of Labor Economics" Vol. 25, No. 1 (January 2007), pp. 97, 98

¹³ Jay G Chambers, "Patterns of compensation of public and private school teachers" p295

Teachers want to teach because they enjoy the subject and the contact with students. Therefore I also think that intrinsic motivation should, and is more likely to, have the upper hand in the case of trying to maximise effort. The teachers should be intrinsically driven to maximise their effort regarding teaching, and regarding the well-being of their students. In fact, the implication of an award scheme or bonus can actually decrease the innate motivation¹⁴. Additionally; the motivation will only increase temporarily after a monetary award, and will decrease below the original motivation level after the monetary incentive is taken away.



A better solution to maximise the teacher's effort might thus be the implication of resources. Lavy found that additional spending increased would impact the children outcomes in a positive way¹⁵. Also Lavy found that if the incentive for teachers to maximise effort was rewarded through resources, there would be a visible improvement on the results of the students. These resources included funds to augment the teacher's well-being, the creation of smaller classes, the application of extra teaching time, and voluntary support classes.

Additionally, a lot of the schools organizational structures are formed so that the head master only communicates with the deputy head teacher and the senior teacher. I think that if there is a direct link between head master and the teaching staff and student council, it will be easier to focus on the positive and negative actions the teachers are performing. Further, there will be a better relationship between the headmaster and the teaching staff which means that problems and solutions can be easily discussed.

The British government has created additional inclinations to encourage people to become teachers. These inclinations could also indirectly lead to an increase in the teacher's effort.

¹⁴ Deci (1971)

¹⁵ Angrist and Lavy 1999

As a qualified teacher in England your salary ranges from £22,244 up to £114,437¹⁶. This means that teachers are able to work their way up, which is very stimulating. The government additionally promises more holidays, an SEN allowance and TLR payments¹⁶. Nevertheless, I don't think this is motivation enough to increase effort.

Another solution, that I believe will maximise teacher's effort, is based on the Finish schooling system. In Finland only the best get picked for becoming teachers. All teachers have to have a master's degree, and only the top 10% of graduates get chosen to be a teacher. Also, the graduates have to go through a training scheme in order to qualify. Furthermore, because the amount of teachers largely exceeds the amount of schools, all classes are small and teachers make sure that they know each and every student personally. Instead of competing, the teachers work together to maximise the results of their methods used.

Once you have become a teacher, you receive a high salary, and a social recognition that would be equal to a doctor's social status in England. They are respected and are the best at what they do, for those reasons they receive a higher salary. This is also an extra incentive for students to become teachers.

Because the selection procedure is so intense, the schools know that they are going to get the best of the best teachers out there. The teachers are mainly intrinsically incentivized to maximise their efforts and a monetary compensation is thus not required.

To conclude I would like to state that monetary compensations are not the answer when it comes to maximising teachers efforts. I think that teachers should, primarily, be intrinsically motivated. Additionally the examples that I have shown in my essay that use monetary compensation all have negative aspects that exceed the benefits. Furthermore we also saw that once the bonus scheme is taken out, the effort falls below the initial effort.

First of all I think schools should offer competitive salaries to teachers, in order to reward their hard work. But I also believe that a harsh selection process like the one in Finland will act as a natural selection process in which only those fittest and most motivated will make it through. Additionally intrinsic motivation would be higher. Like in Finland no monetary compensation would be needed because teachers would already perform at full effort.

I believe that instead of rewarding money to secondary schools so that they can redistribute that towards their teachers, it would be better if collective amount of money would be used towards bettering the schools conditions. If the money were used to, for example, hire more teachers, and therefore create smaller classrooms, children would focus more, teachers would feel less pressure, and there would be more one on one contact with the students. This has been proven to be an effective measure in increasing the students' achievements.

¹⁶ <https://getintoteaching.education.gov.uk/why-teach/competitive-salary-and-great-benefits>

Schools should focus on offering competitive salaries, creating a selection process and better the conditions teachers will face in their schools.

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Interview:

1. Mahdi Said. Ex private school pupil Dubai and family member to private school teacher Dubai.

Lectures:

1. Ludovica Giua, Lecture 5, “Economics of Organizational Management”.

Websites:

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