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**An improved model for internal efficiency and
financing education in Morocco**

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Abstract

The repetition by the child of an education level can be beneficial for him since its aim to reinforce his skills if he is below average. However, the cost of this operation weighs on the budget in Morocco because of the high rate of repetition. In this work, we present an improved model of transition from one level to another higher by involving the internal performance of the Moroccan education system. This model is based on an automatic transition during the first years of primary education with a skill enhancing in parallel. This reinforcement will be carried using ICT and active pedagogies.

Keywords: Education model, financing model, internal efficiency, ICT.

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1. Introduction

The Moroccan education financing consists of three main parts: The state budget, which constitutes 66%, the participation of households with about 25% and private sectors and international loans and donations (Ministry of National Education and Vocational Training, 2015). The state provided about 27% of the state's general budget in 2017 (Ministry of Economy and Finance, 2017) and 5.5% of the state's gross GDP (United Nation, 2015) which is close to the world average rate 4.88% (World Bank, n.d.) recorded in 2014 and the European Union states average with 4.7% (Eurostat, n.d.) recorded in 2016 and above several Arab countries whose performance in the education system is better than Moroccan one [Qatar (3.6% in 2014), Jordan (3.9% in 2015)]. While the positive correlation between public spending and educational outcomes has been proven through international empirical studies (Michaelowa, 2000), the performance of the Moroccan education system remains far from this. In fact, and in parallel with the financial allocations, the performance of the Moroccan education system has been in question for decades despite the major reform projects launched by the state since the end of the 90's. According to the analytical report of the Higher Council of Education (CSE, 2008), only 13% of students enrolled in the first year of primary school obtain their bachelor's degrees with at least 1 year repeated. This proportion becomes down significantly when we consider the percentage of students who obtain their bachelor's degrees in 12 theoretical years 3%! This failure began early in primary; as of the 100 new inscribed students, only 86 completed primary school in 2011–2012. These losses of internal efficiencies are due especially to the problems of repetition, dropout and firing student. In fact, the repetition rate in Grade1 exceeds 10%, whereas the rates in the transition years are 14.3% in the six primary years, 31.8% in the third year of lower secondary and 22.4% in the Bachelor. In addition, school dropout is a structuring phenomenon in the Moroccan education system (1.1% primary, 12% low secondary and 10.1% higher secondary) (Amzazi, 2018). Several factors are involved in this problem, which is cited as the low level of children's skills.

These two phenomena cost the state a fortune, since the school year for a student costs on average 8727 DH according to the last report of the national education accounts published (in primary 7552 DH, college 8469 DH and qualifying 12317 DH) all expenditures combined (the share of the expenditure of the Department of National Education this average is 7381 DH) (Ministry of National education and Vocational Training, 2015). An estimate of the loss of state during the year 2017 (Ministry of National education, Vocational Training, Higher education and Scientific Research, 2018) is presented in Table 1.

Table 1. Estimated expenditure caused by repeating classes and drop out by cycle in Morocco

Cycle	Cost student/ year*	Number of repeaters	Number of dropout	Estimated expenditure billion DH
Primary	5,165	5,12,990	39,461	2.85
Low Secondary School	7,201	4,86,250	1,83,490	4.82
High Secondary School	10,799	2,05,510	92,600	3.22
Total	--	12,04,750	3,15,551	10.90

*Expenditure of the Department of National Education.

The ministry of education lost 25% of the annual expenditure of education (43.6 billion DH) (Ministry of National education and vocational training, 2015). If the state improves the performance of by the repeating classes and drop out indicators, it would have re-used this amount to enhance other aspects of education.

2. From grade 1 to grade 4

The measures taken by the Moroccan education system aim in the majority of cases to redress the weaknesses of the students during the end of the career, especially in the higher secondary school, but at this level, the dropping out or repeating classes quantitative loss is significant.

According to research, repetition does not significantly affect the improvement of the student’s skills. On arrival in the first grade, the student has no sense to repeat the year since the skills required are very minimal. According to Howard Gardner, the child has several intelligence skills, the school must adapt, especially for the first 4 years, to the intellectual competence of the child ‘differentiated pedagogy’ (Gardner, 1983).

In 2016, Morocco participated in the International Program of Assessment of Reading Skills (PIRLS) by 11,000 students in the Grade 4 of primary representing all regions of the kingdom. It was ranked in the last places: the 48th place just in front of Egypt (49th place) and South Africa (50th) (PIRLS, 2016) despite the fact that the performance of Moroccan students has increased compared to the year 2011 from 310 points to 358 points. In another indicator which measures student performance in the Trends in International Mathematics and Science Study TIMSS, Morocco participated by 10,428 students from the Grade 4 of primary school. The result of this study approved also the poor performance of the Moroccan education system in such subject; it’s ranked among the last three countries in mathematics, with a score of 377 and having the penultimate place in science with a score of 352; in spite of the adoption, for years, repetition as a rectify measurement for children who do not obtain the ‘arithmetic average’ modules.

In parallel with the strategy adopted by Morocco, the majority of the countries ranked in the best position of these studies (South Korea, Finland, Japan ...) have introduced a system based on automatic success. This approach doesn’t reduce only spending on education but also improves performance in international tests. So that, there is no correlation between forced repetition and efficiency performance.

The automatic success, in Morocco, can cause harmful results if we do not take parallel measures of supporting and redressing students with learning difficulties. We propose, in this paper, a model of medium term period that can be straightened during the processes and can be generalised in long term. It is based on the automatic transition during the first 4 years with an obligatory support classes in parallel to correct the weaknesses of students in difficulty.

3. Improving the internal efficiency model of the Moroccan education system

The application of an automatic success during the first 4 years will allow the retention of about 2.3 billion DH according to the 2017 census (Ministry of National education, Vocational Training, Higher education and Scientific Research, 2018).

Table 2. Estimated expenditure caused by repeating classes and drop out from grade1 to grade4 in Morocco

Grade	Number of repeaters	Number of dropout	Estimated expenditure billion DH
1	98,902	3,364	0.77
2	72,352	0	0.55
3	72,008	0	0.54
4	59,113	4,009	0.48
Total	296,791	7,373	2.3

Afficher plus

Afficher moins

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The recovery of the estimated amount can be invested in support course for students either through contracting or remedial teaching.

3.1. Contractualisation

Although the budget effort of the state is concentrated on education, 94% of the expenses of the Ministry of National Education are devoted to the salaries of the officials of this ministry. Since 2016, the Ministry of Education has adopted a new organisational model of teachers recruitment by contract, this new organisational model seems to be a strong point for the implementation of a policy of support for schools. Indeed, the Regional Academy for Education and Training 'AREFs' can contract teachers trained to specialised pedagogies to meet the needs of students with low academic knowledge and to cover students from the same municipality. In fact, according to referring judgment 7,259 of 7 October 2016 signed between the Ministries of National Education and Vocational Training and the Ministry of Economy and Finance, the AREFs can contract teachers who receive 4,000 DH. By the estimated expenditure, it's represent or 57,426 contractors possible. However, the distribution of low-skilled students varies widely from one municipality to another, which is difficult to apply in rural municipalities where there is no road connectivity between schools. In this case, overtime can be used.

3.2. Overtime

AREFs may award allowances for overtime worked by teachers. Indeed, in areas where the benefit of a contract is too low, the completion of additional courses using specialised pedagogies can be done by teachers who will receive a sum of 120 DH/hours which is 1920 DH per teacher monthly (4 hours/week * 4 weeks).

3.3. Optimisation problem

Let $c = (c_1, c_2)$, the number of teachers who will benefit from the 'contractualisation' model c_1 and teachers who will benefit from the 'overtime' model c_2 , and $e = (e_1, e_2)$, the number of students who will benefit of the 'contracting' model e_1 and of teachers who will benefit from the 'overtime' model e_2 . The optimisation model to solve in order to obtain its solution is:

Optimise (t) , in which t is the coaching rate (a number of students by a teacher) under the constraint

$$a_1 c_1 + a_2 c_2 \leq \text{Expenditure Budget}, \quad \text{in which } (a_1 = 4000 * 10, a_2 = 1920 * 10)$$

and

$$e_1 + e_2 = \text{the students having passed the grade without the necessary skills base.}$$

The optimal solution of this model will allow the AREFs or Ministry to plan the optimal mode of solution according to the groups of students.

4. Proposed educational solutions

4.1. Differentiated pedagogy

Burns (1971) reported that there are no two learners who progress at the same rate; who are ready to learn at the same time; who use the same study techniques; who solve problems in exactly the same way; who have the same repertoire of behaviours; who have the same interest profile; and motivated to achieve the same goals. For this, it is necessary to resort to the variation of teaching methods and modalities. Differentiated pedagogy or pedagogical differentiation is a solution to heterogeneity; it is centered on the needs where each student will be treated differently, and it is a pedagogy which focuses more on the individuals than on the knowledge. For Legrand (1984), differentiated pedagogy is 'a methodological diversification effort that can respond to the diversity of students.' Meirieu (1989) adds that one must have 'the care of the person without renouncing that of the community. 'This differentiation may concern several elements: contents, learning processes, students' productions and structuring of work in class.

In the context of our work, among the solutions to be envisaged to improve the academic results and to reduce the rate of repetition, it is to envisage made support classes for the students in difficulty within the framework of the differentiated pedagogy.

4.2. E-learning

In teaching, the methods and models of teaching and learning have evolved with the emergence of new tools and devices based on ICT: virtual teaching or 'E-learning' is one of the modalities that is based basically on the use of these devices.

This modality can also be a solution to optimise and reduce the costs of education and training, as Henri and Lundgren-Cayrol (2001) put it: 'Distance learning is most often described as a form of economic training that uses technologies to cross the spatio-temporal distance, thus improving accessibility in an ideal of democratisation of education. It is a model based on using of ICTs (platform, software and internet) which becomes a component of the training itself; with a spatio-temporal separation between the teacher and the students 'a mode of education where the act of teaching is separated in time and space from the act of learning' (Marchand & Loisier, 2005).

In this case, there is the possibility of minimising the cost by reducing the number of teachers and carrying out distance support courses, so that a teacher can supervise a large number of students in difficulty and find in different environments. These courses can be synchronous or asynchronous.

For the first synchronous solution, the students in difficulty can be grouped in a class/by school; the teacher can give his course at a distance, with the possibility of interaction with the different students; this same course can be registered, so that, the students not having the opportunity to attend, to see it in another time and this is where we talk about the asynchronous solution.

Several other scenarios are possible with this modality; it is only an example with which one can optimise the costs of support.

5. Conclusion

In this paper, we presented an innovative improved model for internal efficiency and financing education in Morocco based on re-investing the loss of expenditure due to repeating classes and drop out. By removing the repeating classes in the fourth first grades in primary school and with support courses, we will have students more performed, success rate and retention rate improved and expenditure more optimised.

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