



ANALYZING THE DETERMINANTS OF ACHIEVEMENTS OF BENEFICIARIES OF LITERACY PROGRAMS IN MOROCCO: A MULTILEVEL ANALYSIS

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ABSTRACT

This paper aims to assess the determinants of success of literacy programs in Morocco. This work uses hierarchical models. This specification provides opportunities to simultaneously analyze the impact of individual variables and taking into account the socio-spatial variations. The results show that the quality of literacy services, as measured by the total score, the level of information about the level of knowledge, is subject to variability. The analysis highlighted the diversity of factors that may be responsible for this variability. Some of these variables are related to the characteristics of the beneficiaries, other characteristics of trainers and logistical conditions in which the literacy process unfolds.

Keywords: Achievement, Adult, Literacy, Multilevel, Morocco

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Contribution/ Originality

Aims to assess the determinants of learning achievements of the beneficiaries of illiteracy programs. Some of these are related to the recipients' characteristics, others to the trainers' characteristics and logistical conditions in which the literacy process unfolds using hierarchical models.

1. INTRODUCTION

The accumulated backlog in school enrolment explains the Moroccan unique position in terms of illiteracy. Today, almost one Moroccan out of two is illiterate (43% of the population according to the census of 2004) and this is exactly the case of two out of three women in rural areas. The Labour Force Survey made in 2011 By HCP (Haut Commissariat au Plan) has shown that the proportion of the working age population (15 years and older) with no education level is

about 30%. Within the same population, over than 60% are with no degrees. This pattern contrasts with that observed in neighbouring countries, which have quickly achieved universal primary education but with the same pace of economic development of Morocco. The World Human Development Report made in 2012 places Morocco in the 130th rank out of 186 according to the Human Development Index far behind some comparator countries such as Turkey (90), Algeria (93), Tunisia (94), Jordan (100) and Egypt (112). Morocco is worse when compared to its Maghreb neighbours (Algeria, Tunisia) and records below average performance among Arab countries.

The issue of illiteracy, especially when it affects nearly one worker in two, is a serious burden on the country's economic development and its ability to adapt production technologies further promoting growth. On a wider scale, the illiteracy of the population is an obstacle to human development, be it social practices or collective participation, but also, through the situation of women (there is greater acknowledgement today of the important role of female literacy in terms of regulation of fertility, early childhood care, nutrition, health education...).

Recently, progress has been achieved in primary education in Morocco. They are not yet sufficient with regard to retention and completion of the cycle to put an end to the growing ranks of illiterate adults.

The struggle against illiteracy is also committed through intensified activities specifically those directed to illiterate populations (especially to women in rural areas). In the light of the figures presented annually by the Directorate for the Fight Against Illiteracy (DLCA)¹ and the Directorate of Non-Formal Education (DENF), it is clear that progress has been made.

This paper aims to assess the determinants of learning achievements of the beneficiaries of illiteracy programs. Some of these are related to the recipients' characteristics, others to the trainers' characteristics and logistical conditions in which the literacy process unfolds.

The purpose of this work is to determine the different variables that explain the performance of the beneficiaries of literacy programs using hierarchical models. This specification provides opportunities to simultaneously analyze the effect of individual variables and account being taken of socio-spatial variations. The aggregation level used is the class and the impact of the trainer on the results of the beneficiaries is also analyzed. In the presence of a large majority of female recipients, the gender breakdown issue of trainers can, thus, play an important role in the evolution of effective demand. Indeed, women beneficiaries especially married ones (59% of the sample) prefer a female trainer. The stress induced from the reluctance of beneficiaries towards their male trainers can be exacerbated by the age differences between trainers and recipients and

¹ The DLCA action targets illiterate people aged from 16 and over, while the action of DENF addresses out-of-school children and dropouts aged between 9 and 15

may cause multigenerational conflicts. In fact, almost half of the beneficiaries (47%) are over 40 years old, while almost 80% of the trainers are less than 41 years old.

This study is mainly twofold in relation to the Moroccan context. Methodologically, this contribution is, to our knowledge, the first application of the micro-econometric approach to data collected during our investigation. Analytically, the results of this study complement the few descriptive evaluation works (Ibourk and Sahli, 2003; Ibourk, 2007). The findings of this research are expected to contribute positively to the development of public policies on literacy.

The paper is structured in three sections. The second section discusses the main descriptive results. The third section presents the data used and methodology. The econometric estimates and comments are subjects to the fourth section. The political implications are the subject of the basic remarks in the conclusion.

2. ACHIEVEMENTS IN LITERACY: THE CASE OF MOROCCO

Adult literacy program is through four programs:

- General partnership program: It is an annual program carried out by the Ministry of Education by mobilising, on a voluntary basis, teachers for pedagogical supervision.
- The program of other public operators: These actions undertaken by other governmental departments and public bodies operating in the social field (Handcrafts, agriculture, fisheries, Habbous and Islamic Affairs, National Mutual Aid, Youth and sports...).
- The civil society program: It is the work in partnership with associations. The implementation of this program is relatively new dating from 1998.
- The Enterprises program: It includes actions taken within companies. In the recent few years, several regulatory provisions have been adopted in order to encourage companies to implement literacy programs for their workers. One of the key provisions is the funding of 80% by OFPPT (Office of Vocational Training and Work Promotion) as part of the fund reserved for continuous training.

A review of the annual achievements shows substantial growth of registered numbers between 2003 and 2011 with a tendency towards stabilization of around 800000 enrolled. The following Table 1 illustrates the achievements according to types of programs between 1998 and 2012.

Table-1. The numbers of beneficiaries of literacy programs.

Operator or Program	1998-1999	2001-2002	2011-2012
General Campaign (MEN)	89 500	62 000	42 786
public operators	69 000	105 000	310 017
civil society	21 000	217 000	380 225
companies	1 500	6 000	2 034
Total	181 000	390 000	735 062

Source: The struggle against illiteracy, SECAEN, Rabat

The examination of this table leads to the following remarks:

- A decline over the part of the general partnership program. The share of this program has dropped quite substantially from 50% in 2003 to less than 6% in 2011.
- The proportion of the civil society program tends to level off around 50%.
- The increase in the share of public operators and its stabilisation.
- The starting of the “private sector” program is still problematic. The share of this sector remains insignificant and does not exceed 1% under the best circumstances.

The learnings acquired passing through a literacy program can be assessed in the short term by their consistency and adequacy to their objectives. They can also be assessed over the medium term with respect to their durability and the extent of their use. Finally, they can be examined in a long term perspective compared to the various impacts they generate. The results can be broken down in various forms ranging from learnings acquired from diffused social impacts which they induce.

3. EMPIRICAL ANALYSIS

3.1. Data

Out of a total of 1.619 enrolled beneficiaries, only 997 have completed the cycle. The used data has two characteristics:

-The longitudinal dimension: The survey is to track a representative sample of the cohort of beneficiaries enrolled in literacy programs under the 2007-2008 campaign on the lands under the delegation of the Ministry of Education in Marrakech. The initial sample includes 1,619 people. The sampling frame consists of literacy classes per operator available from the Delegation of MEN. The sample incorporates 4 types of programs/operators (general program, public operators, civil society and private sector).

The procedure of collecting data covers the following activities:

- Taking a proficiency test at three times during the literacy process (at the beginning, in the middle and at the end);
- Collecting socio-demographic data about the beneficiaries;

-The direct measurement dimension: Measuring the learning achievement and sustainability is based on the direct method. Recipients are subjected three times to a direct assessment test which is inspired by the methodology used in international surveys to measure literacy levels. The geographic scope of the study covers Marrakech-Menara province. This province is home to all kinds of programs and presents a great socio-economic diversity (urban, rural).

3.2. Methodology

The econometric analysis aims to explain the performance of literacy programs recipients. Two levels are identified: beneficiaries' level and class level. The selected specification is as follows:

$$Scor_{ij} = \sum_{r=1}^q \gamma_r I_{r,i} + \sum_{e=1}^s \beta_e D_{e,i} + Cte + \varepsilon_i = 1, 2, \dots, N \quad (1)$$

Where $Scor_{ij}$ designates the performance of recipients i , school refers to j ; q is the number of individual characteristics taken into account; $I_{r,i}$ is the modality of $r^{ième}$ of these characteristics of the recipient i ; s , is the number of school characteristics; $D_{e,i}$ is the $e^{ième}$ characteristic modality of school attended by recipient i ; Cte , is the constant; ε_i , refers to random perturbation and N , is the size of the sample. The parameters γ_r and β_e express units of differences in performance of the recipient due to a marginal change in the considered variables. The estimated coefficients are interpreted in percentage as the impact on the performance of variation of the analysed unit of the variable. The equations of the two levels are 1 and 2.

Level 1 :

$$\begin{aligned} Scor_{ij} = & \gamma_0 + \gamma_1 program + \gamma_2 gender + \gamma_3 age + \gamma_4 place_residence + \gamma_5 family_situation \\ & + \gamma_6 number_children + \gamma_7 water_attached + \gamma_8 sanitation_attached \\ & + \xi_{ij} \end{aligned} \quad (2)$$

Level 2 :

$$\begin{aligned} \gamma_0 = & \beta_{00} + \beta_{01} program + \beta_{02} gender + \beta_{03} age + \beta_{04} place_residence \\ & + \beta_{05} family_situation + \beta_{06} number_children + \beta_{07} water_attached \\ & + \beta_{08} sanitation_attached + \beta_{10} Gender_trainer + \beta_{11} age_trainer \\ & + \beta_{12} academic_degree_trainer \\ & + \beta_{14} Administrative_link_between_operator_trainer + \mu_{0j} \end{aligned} \quad (3)$$

The dependent variable in level 1 is the difference between the score obtained in the initial and final test. In level 2, the dependent variable is the obtained constant from estimating level 1 equation. In order to avoid problems of co-linearity, every time we have introduced a reference variable. The explanatory variables include the native language (Amazigh and Arabic, the Arabic language is the reference language).

The age of beneficiaries is approximated by four binary variables corresponding to four possibilities. The reference age is "less than 15". The place of residence is approached by "urban" and "suburban". The reference variable is the "rural" areas. Four variables are used to approach family situation: "single", "widowed", "divorced". The status "married" is the reference modality. The teacher's gender is approached by both "male" (reference modality) and "female". Other variables to be explained also include the number of children of the beneficiary, whether the

beneficiary's house is related to drinking water and sewage facilities as well as the age of the trainer.

3.3. The Empirical Results

3.3.1. The Analysis of Total Score and Its Progression

Out of a total of 1.619 enrolled beneficiaries, only 997 have completed the cycle. The three tests conducted on the subsample of 997 persons who completed the cycle were used to monitor changes in total score over three periods:

- The total period of the program by comparing the initial score and the final score;
- The first sub-period of the literacy program by comparing the initial test and the second test;
- The second sub-period of the literacy program by comparing the last two tests.

Table 2 shows that the evolution of the score is statistically significant. The progression over the period is 5.8 points. A significant part of this growth took place in the first sub-period (3.8 points). The increase in the second sub-period is relatively less important (2 points).

The analysis of the evolution of the score which is based on the total score of all programs is, however, not sufficient to the extent that it does not allow to see the evolutionary differences that may exist across programs.

Table-2. The evolution of the average total score per sub-period

	scores	average	Standar Deviation	T-Student	significatio n
Total period (T1-T3)	initial Test score	5,4	4,1	-32,679	****
	Final Test score	11,2	5,9		

Source: DLCA-UNESCO-UCA survey

To illustrate this, we have decided to study the variability of the evolution taking into account successively the two variables (program type and area of residence).

Table-3. Score evolution according to sub-period by program

		N	Average	Standard Deviation		F-Student
T3-T1	General program	246	4,9111	5,78197	Inter-groups	21,258 ****
	public operators	316	7,956	5,5786		
	civil society	355	4,711	4,93063	Intra-groups	
	Private operators	60	4,5517	4,64248		
	Total	977	5,8012	5,5487	Total	

Source: DLCA-UNESCO-UCA survey

Table 3 shows that the changes in the score by the type of program are statistically significant. The following graph demonstrates that the development of the score is highly

differential. The most important growth is recorded by the “public operators” program. With the exception of the program “civil society” whereby the progression of the second sub-period is higher than that recorded in the sub-period, all other programs have recorded a decline in their pace of progress at the level of the second sub-period. Moreover, the whole program has recorded a deterioration in the second period (decrease of the average total score).

3.3.2. The Trainers’ Characteristics Analysis

Women represent 61% of the trainers in the sample. However, this middle tier ranking masks differences by program. Women are a minority in the general partnership program (44%) and large majority in the civil society program (75%). In the Moroccan context whereby the majority of the beneficiaries are women, the issue of the distribution of teachers by gender may play an important role in the evolution of effective demand. Indeed, female beneficiaries particularly married one (59% of the sample) prefer female trainers. The stress induced from the reluctance of beneficiaries towards their male trainers can be exacerbated by the age differences between trainers and recipients and may cause multigenerational conflicts. In fact, almost half of the beneficiaries (47%) are over 40 years old, while almost 80% of the trainers are less than 41 years old.

Table-4. The trainers’ personal aspects according to the operators

	Total sample	Value			
		General program	Public Operators	Civil society	Private operator
Gender Trainer					
male	39	54,1	39,9	23,7	57,8
female	61	45,9	60,1	76,3	42,2
Average age of trainer	38	48,52	37,47	28,03	29,61
Academic degree Trainer					
patent	21,0	49,3	13,6	11,7	
bachelor degree	26,6	50,7	5,6	33,6	
Bac + 2	4,8			13,4	
Bachelor's degree	45,8		75,0	41,4	100,0
Master	1,9		5,8		
Administrative link between the operator and trainer					
salaried	37,6	100,0	18,2		88,8
temporary	43,9		81,8	50,1	
no formal commitment	18,5			49,9	11,2

The average level of basic training for teachers is very high. More than 50% of trainers have at least a BA degree. Nearly 2% are graduates of Master. In addition to the basic training, the majority of teachers (73.8%) reported having had at least one specific training related to their mentoring mission of the literacy programs. The higher level of the teachers’ basic training constitutes a particular specificity to literacy programs in Morocco compared to Sub-Saharan African countries which often involve former recipients to be literacy teachers.

Table-5. Professional aspects of the trainers according to the operators

Variables	Total sample	Value			
		General program	Public operator	Civil society	Private operator
% Parallel profession	47,5	100	22,2	10	100
% volunteer	34,4	0	0	50	16,7
Experience (in years)	4	4	11	4	4
% Who received no training	26,2	25	5,6	30	83,3
% Received specific training in literacy	29,5	50	22,2	25	16,7
% Received two courses, and more	44, 3	25	72,2	45	-
Number of hours given by the trainer (hours / week)	7	6	14	7	4
% Of teachers say they have received a visit					
- Their superior	75,4	31,3	88,9	95	83,3
- An external expert	34,4	18,8	22,2	70	0
% Of trainers wishing to continue this activity next year	88	81,3	100	90	100

The table show that more than 47% of trainers have a secondary activity. All trainers of the general partnership and “private sector” programs are included in this situation. Also, almost half of all trainers of civil society program are mobilized as volunteers.

3.3.3. The Results of Estimating Econometric Models

The results of model are shown blank in the table 6. It concerns only the estimate of three programs (Public Program, General Partnership Program and civil society program). The models have not been estimated for the corporate agenda due to the reduced size of observations. The estimated average score is 5, 73. Furthermore, the proportion of variability due to class rose to 38, 3% while that of beneficiaries reached 61, 7%. According to the Table, the inclusion of variables in Level I had revised downward the p index from 38, 3% to 30, 9 %.

In addition, upon the inclusion of level II variables, the proportion of variability due to the beneficiary, which remains the most important, has not changed. This is quite normal since reducing the said variability requires the inclusion of level I variables related to beneficiaries. However, their inclusion will be done in a sequential manner in order to measure the impact of each category over θ .

Table-6. The estimation of econometric models by program types

VARIABLES	Public program			General Program			Civil society		
	1	2	3	1	2	3	1	2	3
	coef	coef	coef	coef	coef	coef	coef	coef	coef
Amazigh		-0.783	-0.718		0.256	0.118		-0.283	-0.219
Between 15 and 35		-2.271	-2.474		-1.622	-1.783		-1.453	-1.937
Between 36 and 45 years		-2.294	-2.472		-2.221	-2.377		-0.158	-0.113
46 and over		-4.219**	-4.475**		-1.157	-1.521		-0.432	-0.576
urban		0.891	0.375		-2.705	-3.070		0.0755	0.376
suburban		-1.834	-2.245		-4.942	-6.103**		0.985	0.742
single		-0.713	-0.717		-0.0136	0.0908		-1.551*	-1.765**
widower		-0.431	-0.360		-1.581	-1.607		-1.657*	-1.639*
divorced		-0.375	-0.495		2.156	2.248		0.163	0.273
number of children of the beneficiary		-0.817	-0.850		0.0310	0.123		-0.723	-0.659
the home of the recipient is attached to the water		3.730**	3.678**		-0.398	-0.255		0.405	0.681
the home of the recipient is attached to sanitation		-2.846**	-2.398*		3.338**	3.240**		0.250	0.198
age Trainer			0.158			0.0563			-0.0646
The trainer is a woman			-1.922			2.975			5.426***
constant	7.710***	10.57***	0.124	4.904***	6.621*	2.334	4.953***	5.547**	23.03***
sigma_u									
constant	3.712***	3.843***	2.574***	3.090***	2.992***	2.725***	2.836***	2.844***	1.038***
sigma_e									
constant	4.049***	3.840***	3.841***	4.902***	4.795***	4.790***	4.131***	4.075***	4.080***
observations	316	316	316	246	246	246	355	355	355
Number of Classes	17	17	17	16	16	16	22	22	22
ICC	0.457	0.500	0.310	0.284	0.280	0.244	0.320	0.328	0.0608

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

The results of the estimation showed that the mother tongue of the recipients does not influence the educational performance of the literacy beneficiaries whatever is the followed program. Concerning the age of the recipients, we have noted that only the age group of “46 and over” which significantly penalizes the performance of recipients within the public program. Indeed, learning abilities decline with age. Compared to the beneficiaries of rural areas, the results suggest a deterioration of educational outcomes for the beneficiaries of urban interface especially in the general partnership program. Single recipients and widowers are more exposed to poor educational performances especially in the civil society program. Unexpectedly, we find out that the number of children does not interfere in the explanation of the educational performance of the beneficiaries. Indeed, it was expected that looking after children bothers the beneficiaries and reduces time devoted to the pursuit of the program. As shown in several studies, getting access to drinking water increases the educational performance of children which is applied also on the case of literacy beneficiaries. In a more recent study, [Barde and Walkiewicz \(2013\)](#) have analysed the impact of getting access to drinking water upon the human capital formation in the Brazilian primary schools. They find out that access to drinking water facilities improves the academic performance of the children and increases the tests’ scores and the educational level of the mother;

noting that this complementarity is more pronounced for families with lower and middle incomes but disappears among families with higher incomes. Paradoxically, the connection to the sewage facilities penalizes the academic performance of the beneficiaries of the public program. By contrast, this linkage promotes learning among beneficiaries of the general program.

Concerning the characteristics of the trainer, we note that the age of the trainer has no impact upon the results of the beneficiaries.

The trainer's gender impact upon the outcomes of the recipients is also analysed. In the presence of a large majority of women recipients, the gender breakdown issue of trainers can, thus, play an important role in the evolution of effective demand. Indeed, women beneficiaries especially married ones (59% of the sample) prefer a female trainer. The stress induced from the reluctance of beneficiaries towards their male trainers can be exacerbated by the age differences between trainers and recipients and may cause multigenerational conflicts. The obtained results suggest that when the teacher is female, the academic achievements of the recipients increase especially in the program provided by civil society. This makes sense because most of the beneficiaries of literacy programs are women.

4. CONCLUSIONS AND POLICY GUIDANCE AND RECOMMENDATIONS FOR ACTION

The above comments have shown that the quality of literacy services, as measured by the total average score in which the Level reports on the level of knowledge, is subject to variability/dispersion which can be understood at two levels: (i) the structure of scores and (ii) the evolution of this structure.

The analysis also highlighted the variety of factors that may be responsible for this variability. Some of these variables are related to the characteristics of the beneficiaries, the trainers, and of the logistical conditions in which the literacy process unfolds.

Therefore, even if the Moroccan government manages to make a significant progress in accessing literacy services, the quality control remains a major challenge. Moreover, the augmentation of the reception capacities increases the sources of variability in the quality and makes it very essential to look for a response to the challenges of the quality.

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