

CHAPTER 2

DESIGN AND IMPLEMENTATION

In this chapter, the methodological structure of the MLA project is presented. Given the magnitude of the project and its application in a variety of regional and national contexts, it was necessary to plan each phase meticulously. The project went through the following stages: official request from participating countries, preparation and approval of the Project Document with the specification of the objectives and expected outcomes, the implementation strategies, the calendar and budget, the setting-up of the national and sub-national task forces, the development of instruments, piloting and finalising of these instruments, selecting samples of schools and learners, field testing, data capturing and data processing, data analysis and report-writing and the national seminar for the discussion and wider dissemination of the results from the project.

This overview does not provide detailed information on all aspects of the methodology, but can only provide a synopsis of its key features. Firstly, the importance of a regional approach to the MLA project is highlighted. This is followed by a synopsis of the content and coverage of the tests and instruments used. Thereafter, the pilot phase of the project is briefly referred to. Finally, an account of the implementation strategies of the project is given.

REGIONAL APPROACH

A regional approach was adopted as a strategy for pooling relevant expertise to facilitate the execution of the MLA project. In this case, a group of countries from the same region collectively worked in order to prepare the instruments to be used in the project; to develop the frameworks for selecting the sample; to conduct the analysis; and finally, to write reports related to the MLA data. Although a common approach to instrument development was adopted, the principle of recognising regional specificity or uniqueness was provided for by devising first and foremost a core set of items common to the region and then followed by country specific items. The regional core items were jointly developed by all delegates with the intention that they should be administered in all participating countries. The country specific items were developed specifically to meet the needs and characteristics of each participating country by its respective national task force.

In Africa, the project was conducted in two sub-regions: the Eastern and Southern African region comprising countries where English, or Portuguese is mainly the language of instruction, and the West and North African region, comprising countries where Arabic or French is mainly the language of instruction.

A vital component of the regional approach was its specific focus on endogenous human capacity mobilisation and strengthening. Thus all planned group activities served the purpose of simultaneously achieving the goals and activities of the project itself as well as developing the national capacity of participating countries. Resource persons from within the Africa region with expertise and experience in educational assessment and measurement, research methods, planning and statistics were mobilised to provide technical assistance. In addition, two sub-regional resource centres were established to assist countries in the region to successfully implement the MLA project.

DESCRIPTION OF INSTRUMENTS

The MLA project aimed firstly to generate information on the levels of learning achievement in the three learning areas of literacy, numeracy and life skills. A complementary aim was to elicit information on conditions of teaching and learning of the surveyed learners at home, in the community, at school and in their respective classes. Several sets of instruments [tests and questionnaires] were designed, developed, piloted and tested. The core instruments and items for the 1999 MLA Africa surveys were developed by the two sub-regional groups according to the specifications given below:

TESTS

Literacy Test

The literacy test was designed by language specialists from the different sub-regions to measure the 1999 Grade 4 learners' basic learning competencies in literacy. The assessment of a learner's communicative competence formed the basis of the MLA framework for item construction [Chinapah, 1997:132].

This framework covers four major learning domains in which learners' mastery is measured, namely: vocabulary, reading comprehension, writing and grammar. Most items were not constructed as loose standing items, but were presented in a context. Learners had to demonstrate the necessary strategic, socio-linguistic, discourse and grammatical competencies to interpret or communicate a particular message for a clear purpose.

The Anglophone countries agreed that Grade 4 learner's basic competencies in literacy would be measured in English as a second language, with the exception of Mauritius which tested literacy in both English and French and Mozambique in Portuguese. The Francophone countries measured Grade 4 learners' proficiency in literacy in French as their second language, with the exception of Morocco and Tunisia which used Arabic. The items in the Moroccan and Tunisian literacy tests therefore placed more emphasis on free written expression than on word recognition, without deviating from the framework for item construction. Consequently the possible negative effects of translation were eliminated.

Numeracy Test

Several learning domains were identified for the numeracy test and they altogether refer to an ability to apply decoding, writing, computing, application and measuring skills in a problem-solving context. These skills are acquired by an appreciation of the utility of appropriate arithmetic operations in particular contexts, as well as an understanding of the implications of quantitative statements about naturally occurring trends in every day life. In this project, numeracy skills were tested in the following domains:

- Numbers [numerical manipulations]: including addition, subtraction, multiplication and division of whole numbers and fractions, as well as a comprehension of decimal notation.

FIGURE 2-1: EXAMPLE OF AN ITEM IN THE LITERARY TEST

Your teacher has asked you to introduce your friend to the Gardening Club. Write about your best friend by answering the following questions in full sentences:

The first sentence has been started for you as an example.

- What is your best friend's name?
My best friend's name is _____
- How old is your best friend?

- What do you like about your friend?

- Geometry: the recognition of shape, line in simple and complex geometric patterns, and an understanding of dimensionality and perspective.
- Measurement: an understanding of the concepts underlying the use of measuring devices for the quantification of the physical dimension as well as the temporal dimension [e.g.: distance, proportionality, volume, weight].

FIGURE 2-2: EXAMPLES OF ITEMS IN THE NUMERACY TEST

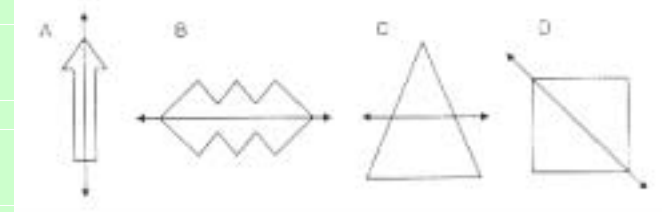
➤ What is 4×24 ?

A. 424
B. 244
C. 96
D. 28

➤ In what unit is road distance measured?

A. Litre
B. Metre
C. Kilometre
D. Centimetre

➤ Which of these does NOT show a line of symmetry?



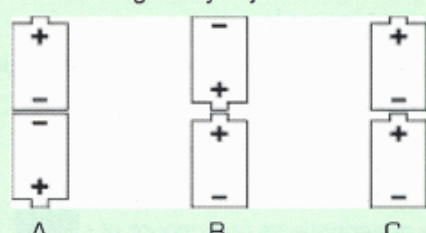
Life Skills Test

The MLA Life Skills Test assessed the basic knowledge, competencies and skills that reflected a functional understanding of information and its application to personal circumstances in a given life domain. The Life Skills Test was designed to assess basic competencies in the five domains given below. There were slight differences between the Francophone and Anglophone sub-regions in terms of their emphasis on certain specific sub-domains.

- Health, nutrition, sanitation and hygiene: The items in this domain aimed at measuring children's awareness, skills and knowledge of basic hygiene, nutrition and sanitation issues affecting their general health.
- Civic sense, protection of the environment, community development: The items in this domain were designed to test children's skills, knowledge and experiences of the social and natural environment and to ascertain whether they were empowered to act on selected issues that affect their daily lives and futures.
- HIV/AIDS and related behaviour: The items in this domain were targeted at tapping the ability of children to think critically, to make decisions and solve problems in situations which could result in contracting of HIV/AIDS. Another aim was to establish the orientation and attitudes of children with respect to the caring of HIV/AIDS infected persons.
- Science and technology: The ability to apply scientific and technological thinking to everyday problems is necessary for children to master their everyday environment. It can lead to improved productivity and self-sufficiency with respect to basic necessities. The test items were therefore designed to assess the extent to which children had acquired and could apply basic science and technology skills and knowledge.


FIGURE 2-3: EXAMPLE OF ITEMS USED IN THE LIFE SKILLS TEST

➤ Which is the right way to join batteries for torch light?



A. B. C.

➤ Which of the following spread Malaria?



A. House flies B. Mosquitoes C. Ants

Science and technology competencies represent an area of learning, which is underdeveloped in most African schools. The MLA approach gives recognition to this area which is of critical importance in enabling individuals to master their environment, especially given the increased availability of information and communication technologies in developing contexts.

QUESTIONNAIRES

The quality of the teaching and learning process is dependent on contextual factors that influence the learner. A number of contextual variables that are identifiable in the immediate environment of the teaching-learning situation [classroom and school] and in the external environment achievement of the learner. In order to systematically capture key contextual variables that influence learning achievement, four different questionnaires were developed: Pupil Questionnaire [target: the parents of the selected learner group], and a School Head Questionnaire [target: Head teachers of schools where the selected learner group was enrolled].



Pupil Questionnaire

In addition to demographic information, the Pupil Questionnaire aimed to elicit information on a range of situational, attitudinal and motivational characteristics of learners. The pupil questionnaire dealt with the following items: learners' personal characteristics such as age, sex, language, grades repeated; their situation at home in terms of access to school and the commitment of their parents to assisting and encouraging them; their attitudes towards school and homework given by the teacher as well as their ability regarding the completion thereof; their choice of subjects and participation in extra-mural activities; and, their access to learning materials, libraries, information and communication technologies.

Parent Questionnaire

On account of the age of the targeted learner population [Grade 4 learners] certain necessary information about parents and home circumstances had to be elicited directly from the parents. Possible limitations on parental ability to complete the questionnaire on account of their not being literate were recognised. It was proposed that this limitation could be offset through assistance from teachers, neighbours and/or family members available at the time the questionnaire was to be completed.



The parent questionnaire was specifically designed to gather information regarding the home environment of the learners that could affect their learning achievement. The questionnaire requested personal information such as family structure, age, marital status, educational background, and occupation of parents. Information was required on the demography of the home, such as the total number of people living in the dwelling, and the number of relatives, siblings and other resident members of the household. In order to determine the learners' home background, information was requested regarding: income sources, type of dwelling, availability and quality of amenities, access to transport, possession of information and communication technology, and food and nutritional status of the home. Items also focused on attitudes of parents regarding: the value of financial investment in schooling, their commitment to assisting their children with homework, the degree to which they were concerned with, and participated in school activities, as well as their aspirations for the education of their children.



Teacher Questionnaire

The Teacher's Questionnaire was structured so as to generate information on teachers that could assist in explaining variations in the profiles of their learners' learning achievement scores in the domains of life skills, literacy and numeracy. The teacher questionnaire paid attention to basic personal and professional characteristics such as sex, age, academic qualifications, training and experience. The instrument also focused on variables that could influence the style and quality of teaching-learning interactions such as the media of instruction, number of learners, number of repeaters, and number of grades taught and the number of class groups sharing the same classroom space. In addition, the instrument required information relating to the availability of various types of classroom equipment, amenities [such as electricity], facilities [including facilities for learners with special needs], teachers' guides, learning support materials, workbooks for learners, stationery, and support equipment [such as duplicating machines] in the particular school. Teachers were also requested to provide information highlighting: the frequency and timing of 'supervisory' visits, availability of services in aid of professional development, workload including time allocated to various functions such as preparation, administration and self development, time and costs of daily travel to school. A core set of questions was developed regarding assessment practices including the frequency and range of assessment modalities. Finally, teachers were canvassed on the critical issue of their career commitment and on their identification of factors responsible for poor learners' performance.



School Questionnaire

The questionnaire that was the most extensive of the project targeted the school head, the data collected through this questionnaire was considered important on the basis that a variety of variables that operate at this level contribute to the managerial and institutional culture of the school. These variables can have significant influence on learner achievement. The questionnaire was designed to obtain information in the following categories: basic school back-ground; school learner enrolment statistics; school head and teaching staff information; school physical facilities, amenities and services; health, safety and security aspects; school finance, governance and management.

DEVELOPMENT OF INSTRUMENTS

As has been noted earlier, the seven instruments developed for the MLA 1999 project were the three achievement tests, namely, Life Skills, Literacy and Numeracy tests, and the four questionnaires, namely - Learner, Parent, Teacher and School Head questionnaires. These instruments were developed by delegates and resource persons from the participating countries over a period of more than a year. In order to support the process, a series of workshops were held where training in item and instrument development as well as in data processing and analysis was provided through shared regional expertise.

In the process of developing the instruments, the Anglophone and Francophone sub-regions differed slightly in terms of the numbers of items, while country specific items were also accommodated [Appendix B: Tables 1 & 2]. Nevertheless, the overall framework for the development of instruments in the Anglophone and the Francophone groups were validated and kept similar so as to enable direct comparisons between the two sets of data.

PILOT TESTS

The Pilot testing of instruments was conducted separately in the Francophone and Anglophone regions, but they shared similar features and procedures. In the former sub-region, the pilot tests were conducted in Morocco and Mali and in the latter sub-region in Malawi and South Africa.

In terms of format, both the Life Skills and Numeracy Tests comprised multiple-choice items only. The Literacy Test was more varied in that it consisted of multiple-choice items with three and four distracters, true/false questions, 'matching' questions, items that required a one-word response as well as responses that required sentence construction.

Two regional resource centres were established to co-ordinate the Pilot phase of the MLA 1999 surveys in the Africa region, namely Morocco for the Francophone sub-region, and South Africa [the Human Sciences Research Council] for the Anglophone sub-region. The two resource centres were tasked to finalise all draft instruments, to develop a manual for managers of the MLA survey in the participating countries, to conduct an evaluative analysis of the pilot instruments, to make recommendations regarding the final form of each of the seven instruments to the working group co-ordinators, and to develop and distribute these final instruments to the participating countries.

SAMPLING FRAMEWORK

The aim of the MLA 1999 survey was to collect data from a sample of intact Grade 4 classes in each country. It was specified that the size of each Grade 4 class selected for the sample should comprise at least 30 learners. However, the following two situations had to be taken into account: [a] when the number of learners in a selected class was less than the required threshold level of 30, and [b] in cases of small schools where the total number of Grade 4 learners in a school was less than 30. For the former

TABLE 2-1 SAMPLE SIZE FOR EACH COUNTRY

Country	Pupil	Schools	Teachers	Parents
Botswana	5529	67	156	5540
Madagascar	3165	194	194	3165
Malawi	3283	137	203	4099
Mali	1365	68	67	1199
Mauritius	1800	60	133	1800
Morocco	4138	180	342	1728
Niger	1532	83	80	1119
Senegal	2223	123	123	2209
Tunisia	3649	138	138	3892
Uganda	8346	280	295	8311
Zambia	1761	74	72	1736
Total	38791	1404	1803	34798

case, randomly selected learners from other classes were used to make up for the shortfall while samples for the latter were accepted as they were. In addition to the learning achievement tests, learners, their parents, class teacher and school head were also requested to complete the relevant questionnaires. Learner achievement scores could therefore be analytically linked to information on the broader pedagogical and social contexts of sampled learners.

SAMPLING PROCEDURES

All participating countries followed the same strategy for sampling that was jointly decided upon in Harare. A two stage stratified random sampling design, using intra cross correlation with $\rho=0,3$ was employed to select schools for participation in the project. This design approach served as the basis for reporting data at the national as well as the regional or provincial level [Different terms which are used by participating countries include province, region or state]. The sample was stratified by school location [urban, rural], school type [enrolled in the school, e.g.: small = <200 learners, medium = 200 to 400 learners, large = 400 to 600 learners and very large = >600 learners]. In addition, the sampling procedure ensured proportional representativeness with reference to national education sub-regions.

IMPLEMENTATION STRATEGIES

In each of the participating countries, national education ministries took responsibility for conducting their respective MLA project. Each country was responsible for sample selection, training of administrators, printing and administration of instruments as well as the coding and entry of all data. In most of the countries that participated in the 1999 project, the instruments were administered between August and October 1999.

The instruments were administered in accordance with jointly agreed procedures that were standardised across all the participating countries. Information on the procedures may be found in the “Project Administration Manual”. An identity number system was developed to ensure that data from each of the instruments could be linked for analysis at a later stage. The battery of tests was carefully planned for completion within a two-day period.

DATA ANALYSIS

The reporting and analysis of the data were approached in accordance with the MLA guidelines developed by delegates from the participating countries. The first step involved the calculation of basic frequencies for describing variables and characteristics of the sampled populations. The second type of analysis involved the development of indices to describe and later to select the background variables that might influence the teaching and learning processes [e.g.: School Access Index]. This analysis is presented in Chapter 4. The third type of analysis involved the construction of the coefficient of variance which provides information on learner performance. While taking into account within country disparities that are due to gender, school location and school type. Lastly, path analysis [using the LISREL program] was used to account for the factors that influence [direct, indirect and total causal effects] learner performance.

The achievement results in the Literacy, Numeracy and Life Skills tests were also analysed with reference to “mastery levels” that were set in each domain. Two broad mastery levels were set: the Minimum Mastery Level for learner achievement was set at 50% and the Desired Mastery Level was set between 70% to 80%, depending on the learning area and domain assessed [See Appendix B: Table 1]. The analysis therefore entailed an examination of the percentage of learners who achieved the specified “Minimum” and “Desired” mastery levels per learning area and domain.

REPORTING

The Africa regional report is a first and unique attempt to provide a macro-level overview of MLA on the continental level in integrating the results from all the completed 1999 MLA surveys in the region. The development of the Africa report required standardisation of data between the regional data sets. [See Appendix B: Table 2]. For the Literacy, Numeracy and Life Skills Tests the items for each domain were collapsed into a composite score that assured the comparability between the Anglophone and Francophone results. The development of a common framework for analysis by participants from both Anglophone and Francophone regions facilitated comparisons, and enabled the inclusion of all participating countries in a single regional report

Although only data from directly comparable items could be included in the present regional report, the information unique to each sub-region that was excluded at this level of analysis will be treated in greater detail in other forthcoming reports. In turn, the reports on MLA at the national level will also be more substantive than the sub-regional reports.

It must be stressed that the Africa regional framework is not meant to dictate the type of analysis that should be conducted and in no way preclude the authors of individual country reports from including supplementary and additional analyses.



Some of the completed 1999 MLA national survey reports point at such a direction. The MLA design allows each country to have specific layouts of the reports with reference to the presentation of the results. Countries could choose the particular features of the data sets for in depth-analysis as well as the construction of indicators for analysis and reporting. Thus the format of country reports are expected to differ in accordance with the unique sets of results and areas of concern of the country.

This report is based in part on the draft regional report presented at the All Africa EFA conference held in South Africa in December 1999, and includes comments and suggestions forwarded by various delegates as well as additions and revisions to the draft report.

