

Documents for Knitting

Document Management Practices in a Craft

Workshop for Bilingual Migrant Women*

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Introduction

This is a study on the document management (DM) practices of low-income bilingual migrant women in Bolivia. The study is based upon a research project carried out from August 1999 to November 2001 in the knitting course of a craft workshop in a small non-governmental educational center, Centro Educativo Multifuncional, Villa Armonía (CEMVA), located in a poor neighborhood on the outskirts of Sucre, Bolivia.

The main theme of this study consists in the analysis of how people handle various visual symbols, how they use documents, and how they interact with each other via documents. Thus, it is related to, but broader and deeper than, conventional research scope of typical “literacy” studies. The main protagonists of this study, the participants in the CEMVA’s knitting course, could fail to be qualified as “functionally literate” in the ordinary parlance of literacy studies. Instead of relying on the “literacy” concept, we are determined to focus on a set of various *document management practices* in this study. We analyze a variety of document management practices in a particular situation, i.e., the knitting course of craft workshop in our case.

Section 1 highlights the importance of a set of human activities in the modern world which are usually described and analyzed with the concept of “literacy”. However, we argue that the concept of “literacy” fails to capture aptly the nuts and bolts of the phenomena in question: people are dealing with a particular kind of instrument, *documents*. “Read and write letters” constitutes only a part of the highly complicated human/artifact interactions. In order to *operationalize* literacy, we propose the concept of *document management*. First, we classify diverse visual symbols used in documents in the following three major categories: *figures*, *numerals* and *letters*. A set of sequential activities (recording-preservation-reference-disposal) regarding a particular document is called *document cycle*, and a series of recurrent, goal-directed activities by no less than one individual which constitute document cycles are called *document management practices*. Introduction of certain document management practices into people’s life entails both the acquisition of particular document management skills by individual, and the development of *document communities* based upon the shared rules and ethics about particular document cycles. We propose an *action–research* especially suited to non-formal education institutions in developing countries.

Section 2 starts by discussing why we selected the craft workshop in a non-governmental non-formal educational center near Sucre, Bolivia. There are a number of reasons: course participants can be classified as “functionally illiterate,” whose document management practices are expected to be poor; they have a stable learning environment in the course; and we can rely on institutional support for trying out various experimental activities. The crux of our research method is repeated implementation of various document management practices as *exercises*. We implemented various kinds of documents related to the knitting course such as future plans, calendars, receipts, new knitting reference book, etc, and encouraged the participants to file them for reference in the future. At the side of the participants, we observed how each document management practice is adopted or ignored.

Section 3 presents the results of our action research. It must be noted that we form our understanding by way of building hypothesis, rather than testing hypothesis already formulated. We feel confident of explaining why some document management practices are exercised better than others. We have detected that there is uneven distribution of skills as well as clear preferences for certain types of visual symbols. We have also observed there is significant lack of cyclical perspectives. We draw a number of suggestions for the further study and activities.

Conclusion highlights two important aspects of document management approach: diagnostic and pedagogical tools.

1 From Literacy to Document Management

1-1 Literacy as a Root Metaphor in the Modern World

Today, there is a fairly general agreement that literacy is one of the key concepts for development in the modern world. For example, *Human Development Report* by UNDP says:

Human development is a process of enlarging people' choices. Enlarging people's choices is achieved by expanding human capabilities and functionings. At all levels of development the three essential capabilities for human development are for people to lead long and healthy lives, to be knowledgeable and to have a decent standard of living. If these basic capabilities are not achieved, many choices are simply not available and many opportunities remain inaccessible. But the realm of human development goes further: essential

areas of choice, highly valued by people, range from political, economic and social opportunities for being creative and productive to enjoying self-respect, empowerment and a sense of belonging to a community. <<http://hdr.undp.org/hd/glossary.cfm>>

While this issue is very important in developing countries, it is not argued that the so-called developed countries have already solved the literacy problems. The first report of the *OECD International Adult Literacy Survey* says:

In recent years, adult literacy has come to be seen as crucial to the economic performance of industrialized nations. Literacy is no longer defined merely in terms of a basic threshold of reading ability, mastered by almost all those growing up in developed countries. Rather, literacy is now seen as how adults use written information to function in society. Today, adults need a higher level of literacy to function well: society has become more complex and low-skill jobs are disappearing. Therefore, inadequate levels of literacy among a broad section of the population potentially threaten the strength of economics and social cohesion of nations. (OECD, Statistics Canada 1995: 13)

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1-2 Operationalizing Literacy – Introduction of the Concept of Document Management Practices

Such a great deal of public attention clearly suggests that the term “literacy” strikes some very crucial aspects of our lives in the modern world. Literacy and related terms are now used as powerful metaphors to conceptualize and describe diverse issues: e.g. “media literacy”, “environmental literacy”, “read mind” and “read economic trends”¹. Nonetheless, in spite of its overall popularity, we think that the term fails to capture aptly the nitty-gritty of the phenomena in question.

We claim that the phenomena we are interested in are particular kinds of tool-use. What we actually encounter with “literacy” as central theme in mind are, in fact, complicated interactions between human beings and miscellaneous artifacts such as “newspapers”, “bills”, “receipts”, “calendars”, “plans”, “maps”, “diagrams”, “missives”, “manuals”, “T-shirts or commodities with logos”. As is explained later, we call these diverse artifacts with visual symbols on their surfaces “documents”.

We are afraid the use of the term “literacy” obscures this simple but important fact of tool-use. In particular, when these practices are analyzed from the “literacy” perspectives, the analyses are liable to serious deformation because of the following two interrelated tendencies in those perspectives.

Predominance of Attention to Letters

As might be well expected from its etymology, in many conceptualizations of literacy, it is argued that they are primarily concerned with *letters*. But letters are only one particular category of visual symbols inscribed on the surface of hard materials and recognized as such by human beings. There is no strong reason to suppose *a priori* that letters always occupies a central position in these multifarious artifacts for the people we are interested in. The term “visual literacy,” which is employed to deal with miscellaneous visual symbols, is flawed by somewhat similar bias as the notorious term “oral literature”.

¹ At the beginning of the year 2003, about 3,980,000 sites are hit by the keyword “literacy” in the search engine of Google (www.google.com). In particular, it occupies a central place in the poverty alleviation policies (ex. 327,000 hits with the keywords “literacy” and “poverty” in the search engine of Google around the same time).

Predominance of Analogy with Oral Language Communication

The material employed as medium greatly matters to every kind of communication between human beings. Oral language communication is no exception: it is realized through manipulation of air. However, the current conceptualization of literacy is a proof of our tendency to treat the interactions between human beings and documents by analogy with (if not extension of) oral language communication. Namely, “read and write” are usually identified as the two major activities of literacy practices, just as “speaking and listening” are the two major activities of oral language communication. In reality, “reading and writing” are just two phases of far more complex cyclical processes involving documents which consist of various activities such as making, conserving, delivering and disposal. We can hardly find corresponding phenomena in oral language uses, aside from metaphorical descriptions of human memory². But the complex processes documents go through in the real world have gathered much lesser attention of researchers of literacy studies than their “read and “write” phases, so far.

For these theoretical reasons, we believe it is desirable to formulate a new concept in order to investigate the issues commonly described with the term “literacy.” In addition, it appears recent advances in literacy studies themselves, in particular those taking field-oriented approaches, call for *operationalization* needs of the literacy concept. Let us take only three instances among the many. First, Oxenham et al. (2002) summarize the results of various projects which link livelihood skill formation to literacy in Africa. The study argues that the attachment of literacy component to livelihood training is more effective than vice versa. It is because participants are more eager to acquire skills in specific than to acquire literacy in general. This finding leads to the needs of formulate the literacy component suitable to each livelihood training. Second, Mikulecky and Lloyd (1993) find that in the workplace literacy training in North America the literacy outcome is quite limited to the area where the training is exercised. That is, there is no transfer from one sub-area to the other sub-area in the broad-defined category of literacy. One literacy achievement does not lead to another. This finding calls for the targeting needs of literacy training. Third, Burchfield et al. (2002) find that integrated literacy training goes hand in hand with broad social and economic development in Bolivia in a large sample survey, and that the targeting in income-generation and health areas is quite effective. This finding, on the one hand, confirms the relevance of literacy training, and, on the other hand, calls for the needs of customization of literacy training for specific purposes in the Bolivian context. All in all, recent advances in literacy studies would point out that *operationalizing* literacy into specific livelihood training is one of the most promising research program in the future.³

In fact, the phenomena we encountered in the craft workshop of a small city in Bolivia were too complicated to be dealt with the ordinary concept of “functional illiteracy.” Thus, we propose a concept of “document management practices.” In a few words, it is an attempt to *operationalize* the concept of literacy for the purpose of field research. Let us start with the definition of the term “documents.”

Documents and three categories of visual symbols on them

The starting point for our study is that we are addressing a set of issues concerning a specific kind of tool-use. The tools in question are “documents.” According to *Oxford English Dictionary* (<http://dictionary.oed.com/>), the fourth meaning of the word “document” says “something written, inscribed, etc., which furnishes evidence or information upon any subject, as a manuscript, title-deed, tomb-stone, coin, picture, etc. (since 18th century)”.

² It should be noted also that no glottal writing system can represent perfectly oral utterances. While the distinction between phonograms (ex. alphabets) and ideographs (ex. Chinese characters) has been one of the controversial topics in grammatological studies, all the existing usable writing systems are realized by the combination of semantic uses (including various layout techniques such as spacing between words) and phonetic uses (approximate visual representations of speech sounds at the syllabic or phonemic level) of visual symbols for particular languages (DeFrancis 1989). Examples from English written with alphabets are the differentiation of the meanings between “white house” and “White House,” or between “fieldwork” and “field work.”

³ Following Oxenham *et al.*, what we mean by livelihood is “knowledge, skills, and methods used to produce or obtain the food, water, clothing and shelter necessary for survival and well-being, whether the economy is subsistence, monetized, or a mixture of both.” (2002: 7)

Whereas “literacy” perspectives tend to attach predominant importance to the letters, we consider them as one of the three major categories of visual symbols inscribed on the flat surfaces of documents (Figure 1).

- (1) **Figures:** miscellaneous visual symbols (such as points, lines and planes of different colors) for representing relational and structural information. Various types of drawings, maps, charts and graphs are included in this category.
- (2) **Numerals:** systems of symbols specialized in the representation of quantitative information and its mathematical operations. This category mainly concerns various numeral systems such as Arabic, Roman and Chinese etc and mathematical symbols.
- (3) **Letters:** systems of visual symbols specialized in the representation of speech. This is the category which concerns the letters *per se*, viz., “glottal writing systems”.

You might argue that it is more appropriate to consider the numerals and letters as two major *sub-categories* of figures specialized in the representations of particular types of information: quantities and language. And yet, we think it is more practical to narrow the boundary of the category “figures” and maintain a distinction among these categories for analytical purposes⁴.

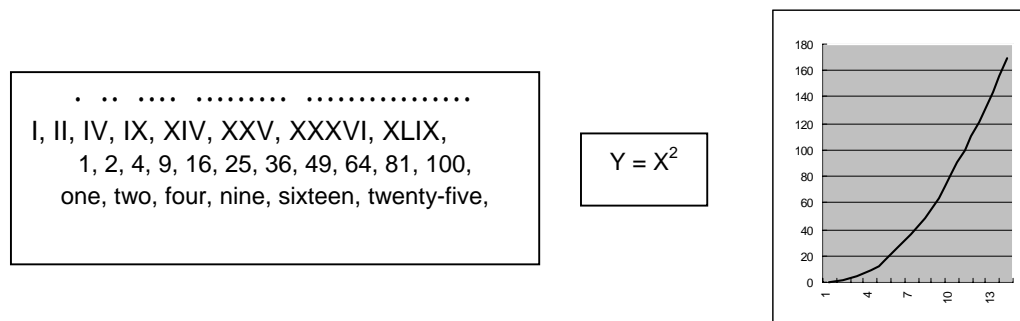


Figure 1: Examples of Diverse Representational Modes of a Presumably Similar Computation Implemented in the Same Way

If appropriately laid out, association of figures, numerals and letters can be used to represent a variety of things. Each representational mode has its own pros and cons depending on the issues to represent. (cf. Marr 1982)

In reality, each of these three types of visual symbols rarely appears on documents in isolations from the other two. On the contrary, when thoughtfully combined, they become powerful tools of thought, communication and expression for us (Tufte 1983, 1990, 1997). And yet, it is noteworthy that both quality and quantity of efforts necessary for mastering and operating visual symbols vary greatly in accordance with their characteristics.

First, figure-type visual representations are both the oldest and most general visual symbols among the three categories. At least since the “cultural explosion” period (60,000 – 30,000 BP), there has never been a “society without figures”. An eloquent evidence is that we have seen an explosive diffusion of participatory appraisal methods in developing countries during the last two decades, where figure-type symbols were extensively employed and welcomed enthusiastically by “semiliterate” and “illiterate” people. It does not mean that figures are visual symbols for primitive and low-educated people. Figures abound in the modern offices, factories and laboratories of industrialized countries, too. These facts suggest that the general ability to draw and interpret figures seems to be a well innate one of human beings, although this potential is not always fully exploited.

Just as there has been no society which makes no use of figures, there has been no society which does not use numbers. The difference between the two symbols lies in human abilities to capture them. According to

⁴ Similar tripartite classifications are employed by the above mentioned *International Adult Literacy Survey* (1995, 1997 & 2000) (<http://www.nald.ca/nls/ials/introduc.htm>), and its successor *Adult Literacy and Lifeskills Survey* (<http://www.ets.org/all/survey.html>).

recent cognitive science studies, our proto-numerical abilities are very limited without languages or cognitive artifacts such as numerals.

An organ specialized in the perception and representation of numerical quantities lies anchored in our brain. Its characteristics unequivocally connect it to the proto-numerical abilities found in animals and in infants. It can accurately code only sets whose numerosity does not exceed 3, and it tends to confuse numbers as they get larger and closer.

What modern mathematicians call numbers include zero, negative integers, fractions, irrational numbers such as π , and complex numbers such as i (root of minus one). Yet all of these entities, except perhaps the simplest fractions such as $1/2$ or $1/4$, posed extraordinary conceptual difficulties to mathematicians in centuries past – and they still impose great hardship on today’s pupils (Dehaene 1997: 86, 87)

Thus, mastering numeracy skills signifies a painstaking construction of an ever-developing complex system for pursuing numerical universe from a rather modest innate basis with supports from great mathematical inventions realized by foregoers⁵. Thus, it is generally observed that there is an impressive gap between the innate abilities and acquired skills for numeracy. As most of us notice after leaving school, we need strong efforts to continue using and improving our numeracy skills.

We cannot find such a great gap between nature and nurture for the mastery of writing systems. While it is quite difficult to manipulate letters at will even in the cases of writing systems containing only dozens of letters such as alphabets, every healthy adult person can maneuver their mother tongues in oral mode beautifully. Two interrelated issues are involved in the process of mastering literacy skills *per se*: the learning conditions of individuals and the maturity of languages as “grapholects”. The latter poses serious problems for the promotion of literacy in “languages without long writing tradition”, such as indigenous languages of Sub-Saharan Africa and Latin America. Whereas the introductory campaigns for non-literate people can be successful with primers prepared especially for the campaigns, post-literacy campaigns often fall into stagnation because of the scarcity of documents written in those newly written languages. The poor circulation of documents aggravates their quality, and vice versa⁶.

The above cursory review suggests that the costs of using three types of visual symbols vary significantly depending on diverse factors such as our innate abilities and learning conditions, elaboration of representational modes, and material conditions for their implementations.

Document Management (DM)

It is almost a *cliché* to equate the main activities of “literate” people with “reading and writing.” However, they are only two phases of more complicated process of recording-preservation-reference-disposal (Figure 2). We use, therefore, the term “manage” as a generic term for these various but closely interrelated activities.

Once produced, documents undergo complex processes during which they are modified, preserved, referred to, copied, handed over to other people/places..., and most of them are thrown out in the end. Let us call this entire process “document cycles”. While some documents have rather stable and standardized

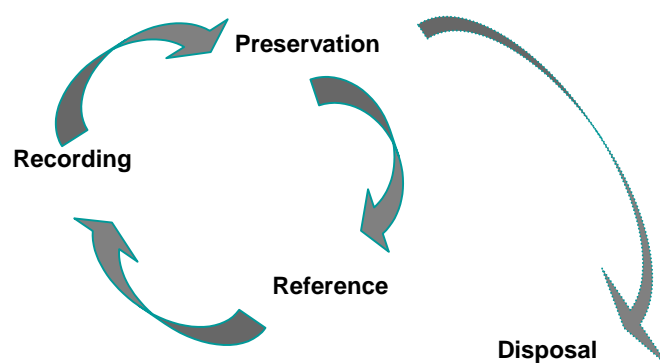


Figure 2: Schematic Model of Document Cycle

⁵ As a matter of course, there are people who are able to carry out quite complex calculations without taking notes, some of whom are qualified as “illiterate” (Lave 1988, Nunes *et al.* 1993). Furthermore, electric calculators are taking over calculating tasks by human beings increasingly. And yet, it is still true that written arithmetic and algebraic skills help most of us greatly.

⁶ Please recall that the mature grapholects have gone through centuries of gradual but profound transformations to reach the current state which now possess not a few unique characteristics distinct from their oral counterparts. Cf. Olson 1994. See Cavallo, Guglielmo & Roger Chartier 1997 for the cases of European languages.

cycles, others follow irregular and unpredictable cycles.

Document Management Practices

The nature of document cycles depends on various factors including material conditions of documents. However, document cycles are not reducible to technological attributes of documents. The cycles come into being only through complicated long-term interplay among individuals and documents. Then, in order to understand how these cycles are realized (or fail to be realized), it is crucial to bring into focus the daily *practices*, namely “a recurrent, goal-directed sequence of activities using a particular technology and particular systems of knowledge” (Scribner and Cole 1981: 236), of individuals handling documents.

We can argue that people who are interconnected through certain documents constitute a kind of community underpinned by the shared trust in them. Let us use the term "document community" to refer to this kind of community. Viewing from this perspective, what are called "mature literate societies" are in fact conglomerates of multifarious document communities. Calendars, passports, fliers, certificates, Scriptures, bills etc. have their own document cycles. The "literate people" are those who can deal with countless documents they meet everyday properly (fill out, sign, modify, preserve, pass on to other people, ignore, throw away, etc.) depending on the contexts and following the norms and ethics shared by the document communities they belong to.

In practice, it is possible, not easy though, to trace the cycles of various documents to some extent through field research. And yet, document communities rarely do manifest themselves in a conspicuous way. In particular, when documents get around smoothly in day-to-day situations, it is difficult both for the parties concerned and outside observers to make explicit the regulating social norms behind the scenes. Nonetheless, we cannot do away with the supposition of the existence of those communities not only for the sake of research but also as inhabitants of "literate societies".

Two Aspects of Assessment of DM Practices

Documents are almost ubiquitous in the modern world. We propose to examine DM practices focusing on the following two aspects in the field.

(1) How are different visual symbols associated on the surfaces of documents?

There are often several combinations of visual symbols for representing similar things (see Figure 1). The choice is decided not only on the basis of effectiveness, but also by education, preference, and customs. Therefore, the most convenient combinations for the majority is not necessarily adopted for circulation. Therefore, it is important to examine what kind of visual symbols tend to be produced and prevail in different situations.

(2) What kind of cycles do documents go through?

DM practices consist of recording, preservation, reference, and disposal. It is important to observe how the participants manage document for each specific purpose. Some document cycles may be weak, others may be stable. And, some may not be born yet.

Examined from the two aspects, DM practices in particular situations can be assessed. We could observe some DM practices are implemented better than others. We need an analytical framework to explain the tendency.

Analytical Framework of DM Practices

Each DM practice has its own characteristics. We propose to classify DM practices from the following two axes (Figure 3):

Axis-1: the characteristics of information

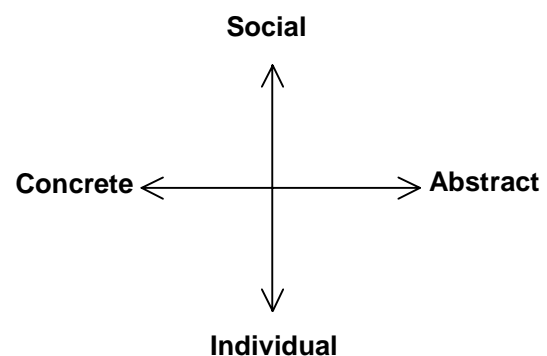


Figure 3: Two Axes for the Classification of DM Practices

represented on the documents: concrete – abstract. It can be varied from concrete ones like drawings of knitwear to abstract ones like tables of balance sheets.

Axis-2: the social compass of the document cycles: individual – social. While some DM practices are confined to the private realms of individuals (ex. diaries), other documents circulate among numerous people (ex. paper currencies).

We believe this is a useful way of classifying a number of DM exercises. As described below (section 2-2), DM exercises conducted in our research project are classified according to this framework for evaluation and policy purposes.

This is a brief overview of the concept of DM practices. We think that the concept of DM practices can be applied to various research topics as long as any “literacy” issues or documents are concerned. Nonetheless, the concept has to be customized further in accordance with the circumstance of each research project. In our research project on a small craft workshop for low-income bilingual migrant women in Bolivia, the DM concept was elaborated so that we could take advantage of two practical utilities of the concept in field as explained in the next section.

1-3 DM Perspective in Action – Field Research on Non-Formal Education (NFE) Institutions for Adults with Poor Educational Background

Two Main Utilities of DM in the Field: Diagnostics and Improvement in NFE Institutions

Our research project was conducted in a craft workshop for bilingual migrant women, namely, a kind of non-formal education (NFE) institution for vocational training. We believe our research project has substantial contribution at two levels. On the one hand, the findings of research project shed light on the actual problems of “functionally illiterate” people from multiple aspects. This is the diagnostic aspect of DM approach. On the other hand, research findings can be used for promoting current DM practices by introducing more effective DM exercises. This is the pedagogical aspect of DM approach. We can emphasize that these two aspects, both diagnostic and pedagogical, go hand in hand. In practice, DM exercises are expected to be customized in an evolutionary manner so that DM exercises become more suited to particular situations by taking into account the findings from prior exercises.

The NFE institutions for people with poor educational backgrounds have several important characteristics from the DM perspective as below:

- (1) Most participants are “illiterate” or “semiliterate”. In other words, they have only poor DM skills.
- (2) As a consequence, it is difficult for those NFE institutions to serve as a platform of a complex of document communities. For example, almost all activities in these institutions tend to be realized through oral communication involving poor document cycles.
- (3) The above difficulties tend to be aggravated because of insufficient financial, material and human resources available to NFE institutions.

These characteristics are likely to form a vicious cycle. However, there are a few characteristics favorable for the development of useful DM practices in NFE institutions.

- (4) In general, the curriculums of NFE institutions are flexible in comparison with their formal counterparts. Therefore, it is easier to experiment various DM exercises.
- (5) Most participants are adults under pressure to acquire DM skills useful for the betterment of their living standards. Therefore, it is easier to select and prioritize DM skills appropriate for the vocational training which the participants are tackling (what are called “functional literacy”).

In brief, the diagnostic aspect and the pedagogical aspect of DM can be integrated in daily activities of NFE institutions. DM approach can be applied in the field research as a conceptual tool for implementing a kind of *action research* projects. In the following section, we explain how the concept of DM was applied to the existing activities in the knitting course.

2 Research Framework

2-1 Why Bolivia, Why Craft Workshop for Urban Poor?

Poverty and Education in Bolivia – Needs of Non-Formal Education

Bolivia is a country which needs quantitatively larger and qualitatively better non-formal education. There are various reasons.

According to Bolivia's *Poverty Reduction Strategy Paper* published in March 2001, it is estimated that in 1999, 46 percent persons who speak only Spanish in urban area were in poverty and 18 percent were in extreme poverty. In contrast, 58 percent of persons who speak indigenous language in urban area were in poverty and just under 30 percent were in extreme poverty. The differences in living standards between indigenous and non-indigenous people in urban area could be attributed to various factors, including discrimination and segregation, difference in education, and access to social services and labor market.

If education is defined as accumulation of productive skills, it is arguably one of the most important ways of upgrading the living standard. A poverty stricken country such as Bolivia needs educational improvement desperately. And, education should encompass not only formal education which focuses on particular age groups, but also NFE which is more flexible and technical-oriented for the sake of mainly adult participants. Many persons in Bolivia who have fallen out of the formal education need another educational opportunity. That is precisely the role which should be filled by NFE.

Poverty Reduction Strategy Paper also shows that between 1985 and 1997 an average 7 out of 10 jobs were created by micro and small enterprises, where many persons learn jobs informally and unsystematically through *on-the-job* training. It is expected that NFE, if properly designed, would complement on-the-job training.

Bilingualism and Non-formal Education for Indigenous People

The choice of languages (and scripts in some cases) affects greatly the course of DM practices. In fact, bilingualism has been one of the most controversial issues in the history of educational policy and programs for indigenous people in Bolivia.

An important issue of bilingual education in the present Bolivia from the DM perspective is the *immaturity* of indigenous languages as written languages. We can notice it, not only from the incessant debates on the “appropriate” orthographies, but also from the scarce presence of documents written in indigenous languages in the Bolivian society⁷.

Knitting and Document Management

Some might wonder if there is any significant interrelation between knitting and document management. In fact, we know that there have been a number of great textile traditions in both “literate” and “non-literate societies” including pre-Columbian South American societies. These facts attest that we do *not always* need to manage documents in order to make high quality knit items. And yet, documents are rather closely linked with knitting activities in the modern world in the following aspects.

(1) Planning and realization of elaborate designs

Figures and written arithmetic can help us to plan and carry out highly elaborate designs cost-effectively.

For example, geometric patterns composed of visual symbols called “knitting symbols” are popular among both

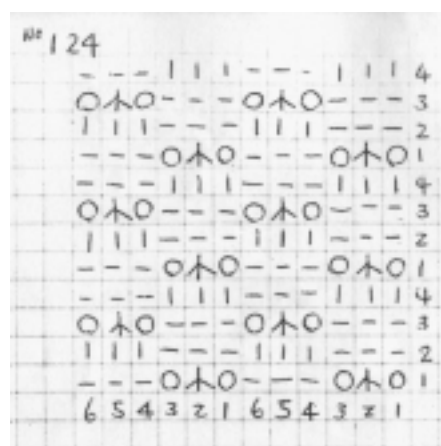


Photo 1: Example of Stitch Patterns Represented with Knitting Symbols. Used in DM exercises in CEMVA in 2000.

⁷ A recent significant exception is the production of primers in the indigenous languages in the *Reforma Educativa* started in 1994 (<http://www.veips.gov.bo/>). See Archondo (1999) for the debates on the position of indigenous languages and cultures in the reform.

professional and amateur knitters in many developed countries (Photo 1). These figures enable them to copy and invent new patterns with less cost than trying out them actually with yarn and needles. Figures can be also used for the planning of sophisticated three-dimensional shapes such as sweaters of modern western styles (Photo 2). The shapes of knitwear do not have to be as strict as those of needlecraft: the elasticity of knit cloth is as high as 10 % and some people prefer loose-fitting knitwear to tight silhouette one. However, the shapes of some parts such as neckline and armholes remain of crucial importance from aesthetical point of view for many people. The subtle differences of shapes influence the price setting and the sales of commercial knitwear greatly in market economy. Knitters can make drafts of the images in their mind freely before knitting them.

There comes in written arithmetic. First, gauge count is indispensable for the realization of the planned stitch design, because the density of knit cloth varies greatly according to the sizes of yarn and needle, the selected stitch patterns, the desired feelings (tight or loose and lacy), and the knitters' hand, so on. Therefore, the knitters have to prepare a small swatch (15 cm x 15 cm in general) and count the stitches and rows per unit (10 cm x 10 cm at the center, for example)⁸.

These counts are multiplied in order to know the necessary numbers of stitches and rows for different parts including the subtly curved ones such as necklines, of which the curved shapes are approximated with orthogonal cross lines (Photo 2). It is very difficult to work up the shapes of these parts as designed smoothly without knowing the necessary numbers of stitches and rows in advance, and written arithmetic certainly comes in for these tasks. As we will see below, people with poor written arithmetic skills tend to fail to realize sophisticated designs.

(2) Commercialization of Knitwear

As is noted above, documents can be employed as powerful tools for making quality knitwear. One of the major reasons for the pursuit of high quality is surely commercialization of the products. In the case of order made systems of hand knit items, several kinds of more complex DM come in, such as bookkeeping and advertising. These commercial DMs are naturally loosely linked with the above DMs for quality knit products.

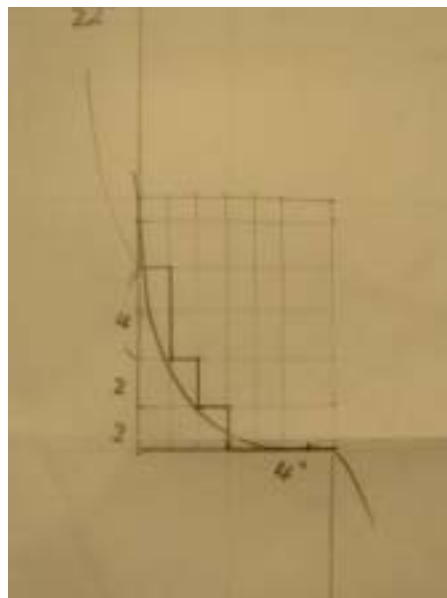


Photo 2: Close up of Drafting for a Sweater.

A curved line for armhole is approximated with orthogonal cross lines, of which units are determined based upon the gauge count for this production. Original size: 9 cm x 12 cm.

Knitting Course of CEMVA

The main protagonists of our research project are bilingual speakers of Quechua and Spanish learning knitting in a craft workshop of a small NGO located at the outskirts of the city of Sucre, the capital of the department of Chuquisaca. It is a typical NFE institution for the poor in developing countries.

Three craft courses were offered in 1999: knitting, needlework and leatherwork. The participants of the workshop pay 5 Bolivianos (Bs.) for registration and 10 to 15 Bs. as a monthly fee of the courses⁹. These expenditures are certainly not negligible ones for the ordinary inhabitants of this zone. They attend the craft courses mainly for acquiring manual skills useful in their daily life. Moreover, they hope that these skills would give them more chances to earn some money. Therefore, we might be able to qualify the course participants as "middle class of the poor" in that they afford these expenditures despite their rather severe and unstable living conditions.

The general characteristics of the knitting course participants as of August, 2000 can be summarized as below:

⁸ See <http://knitting.about.com/mbody.htm> for more information on gauge count.

⁹ One US dollar was almost equivalent to about five Bs. around the year of 2000

- ◆ Number of the participants: 35, all women
- ◆ Age (years): 11 ~ 38, mean = 18.7, mode = 16 (6 women)
- ◆ Civil State: married = 13, single = 22
- ◆ Languages: Quechua & Spanish
- ◆ Average of Educational Background (years): = 5.8
- ◆ Main Daily Activities: Domestic chores
- ◆ Interests in the Craft Workshop: To acquire craft skills, School-like atmosphere, to meet friends etc.

Most of them can be characterized as “functionally illiterate” if we follow the parlance of the development aid circle.

Start of the Research Project

The knitting course is one of several courses offered in the craft workshop of CEMVA. All the members of the knitting course were women from teenagers to women over thirties. While some were born in rural areas before moving into this area, others were born in this neighborhood. Most of them were bilingual speakers of Quechua and Spanish. They had received only primary education (a few girls were still in school) and somehow managed to read and write rudimentary Spanish texts, but had only minimum habits of using documents in their daily lives.

As the participants' lives were tightly incorporated into the city of Sucre that is both political and economic center of the area, the staff of the workshop were keenly aware of the necessity for them to master some kinds of *alfabetización*. They felt those skills must constitute a kind of "life skills" for the people living in severe conditions. However, the staff had sensed that the existing ordinary *alfabetización* programs were not appropriate for tackling this difficult issue.

Thus, we - the researchers and the workshop staff - decided to collaborate in order to introduce some DM exercises into the knitting course in order to investigate the questions as follows¹⁰. What kinds of documents and their management skills are necessary and appropriate to the participants of the knitting course? How do the participants accept, modify or refuse those attempts? If the new document management exercises do not stay with the participants firmly, what are the causes? And what can we - the researchers, the workshop staff and the participants - can do to break through the situation?



Photo 3: Example of Main Pages of Hand-knit Albums Prepared in the Knitting Course (August 1999). Each album contains 35 ~ 40 sheets. Original size: 22 cm x 28 cm.

¹⁰ The joint research project was carried out by the following people:

<Research Team>

Yusuke NAKAMURA: Associate professor of the University of Tokyo (Japan): director of the research project.

Teofilo LAIME: Researcher-lecturer of the Universidad Mayor de San Andres (Bolivia): research on bilingualism and literacy.

Hideo KIMURA: Professor of the University of Tokyo (Japan): research on rural-urban migration

Yoshiaki HISAMATSU: Assistant researcher of the University of Tokyo (Japan): quantitative data analysis.

<Craft Workshop Staff and the knitting course Participants>

Hiroko KAZAMA: UN volunteer: director of the craft workshop of CEMVA (Sucre, Bolivia): coordination of DM exercises and research on craftworks.

Victoria MIRANA: the instructor of the knitting course, CEMVA (Sucre, Bolivia): implementation of DM exercises.

2-2 Research Methods and Procedures

Investigating Prior DM Practices

The joint research project started in August 1999. To begin with, we looked into the course participants' current DM practices more closely.

There existed several documents in the knitting course such as manuals for knitting and the attendance book. However, most of them were rarely used by the participants, except for the hand-knit albums prepared for graduation (Photo 3). The examination of their existing DM practices revealed that:

- (1) Most participants had basic skills to write down letters, numerals and figures in order to deal with the basic tasks necessary for the management of the knitting course.
- (2) However, their spatial arrangements of letters, numerals and figures tend to lack order as the entries increase. For example, they tend to ignore the utility of section paper for visual representation of quantitative information (Photo 4). Furthermore, not a few participants failed to write indo-arabic numerals in accordance with the place-value system, even though they could read them.
- (3) They have technical skills and passion enough for making elaborate albums on their own, but they rarely care for referring to them in the future.
- (4) The existing hand-knitting reference booklet (only four sheets of paper) was far from easy to use. They consisted of step-by-step explanations of knitting procedures in typed abbreviated Spanish texts (Photo 5).

These preliminary analyses suggested that many participants lacked the occasions to develop their rudimentary DM skills. It was even probable that they would lose those skills with disuse, if they remained in such a state further. However, it appears in the knitting course there are not a few occasions in which it would be meaningful to manage various documents.

Therefore, we decided to start a kind of action research jointly: implement different DM exercises in the knitting course; monitor their results and impacts; propose new DM exercises, so on.



Photo 4: Example of Poorly Represented Histogram: Register of Consumed Balls of Yarn in the Knitting Course

Whereas Kazama filled in the first entries (the fifth line at the bottom) as demonstration, the participants ignored the grids for writing in slashes, thus, the resultant lines of slashes fail to represent the quantities systematically.

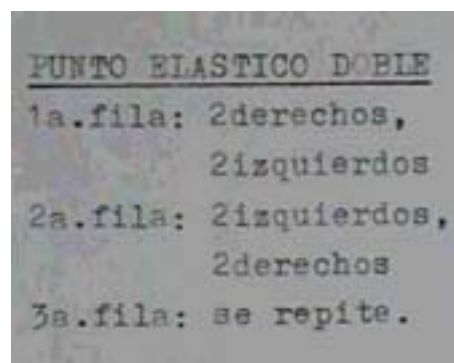


Photo 5: Close up of Existing Hand-Knitting Reference Booklet.

Knitting procedures are explained in abbreviated Spanish texts. Original size: 21.6 cm x 28.0 cm, 4 pages.

Investigating Bilingualism and Literacy Skills

Along with the examinations of existing DM practices, at the start of the project we studied the participants' linguistic capabilities and literacy skills *per se* (= skills to manipulate alphabetic letters in order to represent and decode linguistic utterances) in Quechua and Spanish using the following two methods. Whereas we could not expect these standard scientific investigations to contribute directly to the improvement of the participants of DM practices, the research result provided us with invaluable data concerning their bilingualism and literacy skills.

Participants of the knitting course: In total about 50 women took part in various DM exercises including the edition of a new bilingual reference book of hand knitting. In particular, Sra. P. contributed greatly through her committed facilitation of exercises.

Interviews

We conducted individual interviews of the participants in order to analyze their oral competency of Spanish and Quechua. In particular, we looked into how the verbs of manual, cognitive and attitudinal activities (ex. *hacer, usar, aprender* etc.) were used by them when talking about knitting.

Paper Test

We prepared a paper test in order to see how the participants write and read Spanish and Quechua. Most of the questions concerned literacy skills in Spanish: first four sets of questions mainly asked about orthography, phonetics and syntax in Spanish. The last two sets asked about semantics in Spanish and Quechua (including the translation between the two languages).

In addition, texts of Future Plans written by several participants were also analyzed in order to see their capabilities in free composition in Spanish.

Introduction of DM Exercises

Various documents managed by the participants themselves are the main data sources of our research project. We implemented several kinds of DM exercises in the research project as below (presented roughly by the order of implementation):

Future Plans

As the introduction to DM exercises, we handed out to each participant a sheet of blank paper and a pencil and asked them to write or draw freely what they were planning to do in the workshop in that year. The similar exercises were implemented each year. Main documents managed in the exercises: blank sheets of paper for making future plans.

Calendars of Activities in the Workshop

We asked the participants to make calendars for the activity plans in the workshop regularly. Calendars of different (annual, quarterly, and bimonthly) terms were used. Main documents managed in the exercises: blank calendar sheets for planning the activities, calendars put on the walls of the knitting room for reference.

Filing

In March 2000, after several DM exercises, we provided each participant with her individual file folder free of charge for preservation of various documents prepared in the knitting course, and thereafter we held a filing session after each major recording session. Main documents managed in the exercises: documents prepared in various exercises.

Sociodramas

The participants were asked to act simulations of commercial transactions involving DMs typical of knitting industry such as the purchase of balls of yarn in a handicraft shop and the order for a sweater to CEMVA. These exercises involved more complicated document cycles of larger scale than previous ones in which they only had to take into account themselves, peers and workshop staff at most. The *sociodrama* sessions were held twice during the project. Main documents managed in the exercise: props for the *sociodramas*: calendar, flyer of CEMVA, price list, ruler etc., order sheets and receipts.

Editing of a New Hand-Knitting Reference Book with Knitting Symbols

When we recognized the inconvenience of the existing hand-knitting reference booklet (Photo 4), we decided to edit a new hand-knitting

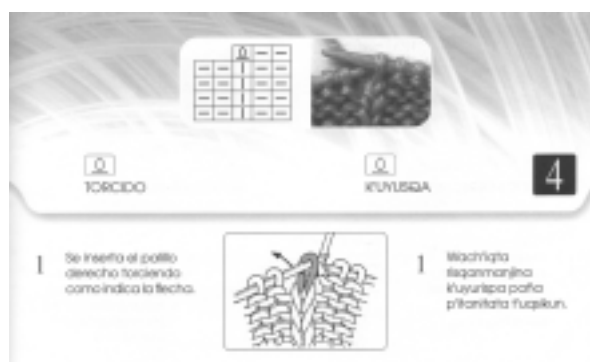
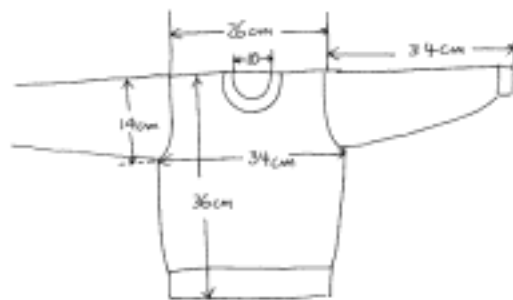


Photo 6: Close up of a Page of New Hand Knitting Reference Book Edited during the Project. Knitting symbols, photos, illustrations of knitting procedures, and bilingual explanatory texts (left: Spanish, right: Quechua) are laid out on each page. Original size: 21.0 cm x 31.0 cm, 43 pages.

reference book for beginners modeled on a Japanese one¹¹, in which the hand-knitting processes would be explained through good combinations of letters, numerals, figures (knitting symbols and illustrations (Photo 6). We involved the participants to the editing process as much as possible by inviting them to check the texts in Quechua and to take part in the tryout session of the pilot version. Main documents managed in the exercises: manuscripts of texts in Quechua and Spanish, pilot version of reference book of knitting symbols, assignments for homework in the tryout session, Japanese reference book of knitting symbols.

Production by Order

As the final DM exercise in the project, orders for sweaters for baby were put by the research team through documents in which the shape, size and designs are indicated with illustrations and knitting symbols (Photo 7). The participants went through the ordinary DM process for commercial knitting production by order: filling out of order sheets and production memos, issuing of receipts of advance and balance etc. Main documents managed in the exercise: order memos prepared by Kazama, order sheets, pilot version of reference book of knitting symbols, Japanese reference book of knitting symbols, receipts, production memos, evaluation sheets.



nivel 1 y nivel 2 son mismas telas
 Cuando explica a las abuelas, use la pizarra y
 dibuje así ↑, indique con "centímetros"

Exercise Implementation Procedures

In order to examine the impacts of various DM exercises on the participants, it would have been desirable to implement the exercises in a strict and systematic way: creation of treatment and control groups, periodical implementations of DM exercises etc. However, such a school-like research style did not seem appropriate or practical for a non-formal learning institution such as CEMVA. Therefore, we decided to implement DM exercises as supplements to regular knitting activities in a rather sporadic and casual way.

And yet, it seemed unlikely that the participants would tackle those novel tasks willingly just by encouragement. In fact, they looked well perplexed when we handed out blank sheets of paper and pencils for Future Plans for the first time, even though we just asked them to express their plans freely on paper.

Therefore, we decided to introduce participatory methods in order to facilitate the DM exercise implementation. Three people – Kazama, one participant, and one instructor of the Knitting course – were sent to a one-week workshop on PRA organized by an NGO in Sucre. Fortunately, Kazama and the participant, Sra. P got many inspirations from the workshop and started to incorporate PRA ideas and techniques, not only to the implementation of DM exercises, but also to the daily management of the Knitting course. In particular, Sra. P turned out to be a good facilitator. It was thanks to her active participation that the DM exercises were smoothly implemented in our project.

Photo 7: Part of Order Memos made for Production by Order Exercise

Price of the sweater =42 Bs (cost of material included).

Original size of illustration: 12 cm x 18 cm

Schematic Panorama of the DM Exercises

In general, documents serve multiple purposes simultaneously. As for the knitting course, we classified the areas in which DMs are highly relevant into three major categories as below (Table 1):

- (1) Knitting: supports for more effective and better knit making
- (2) Workshop administration: coordination of individual and group activities in the workshop with documents
- (3) Micro-enterprise: simulations of commercial transactions involving documents

¹¹ *Yokuwaku Amime-Kigo Book: Bohbari-ami 120 (Clear and Simple Knitting Symbols)* (Nihon Vogue Co., Ltd., Tokyo, Japan. 1994).

		Future Plan	Calendars	Sociodramas	Filing	Knitting Symbols	Production by Order
Principal Constituents of DM Skills		REC: letters/figures	REC: letters & numerals	REC/REF: letters & numerals	CON/REF: letters, numerals & figures	REF: letters, numerals & figures	REC/CON/REF: letters, numerals & figures
Relevant Area	Knitting	*			*	**	**
	Workshop Administration	*	**		*		*
	Microenterprise & Document	**	**	**	*		**

Table 1: DM Exercises x Relevant Areas of Knitting Course

As a whole, the exercises started from game-like simple ones (like expressing freely Future Plans on sheets of paper), to more complicated and real-world like ones (*Sociodramas*), and to difficult ones such as accepting orders of knit items from the research team members (Production by Order), although the last one was actually still in the exercise stage (Table 2). All exercises are related with at least one of the above major areas of DM for the knitting course, namely, knitting, workshop administration, and micro-enterprise. The order of the presentation roughly follows the order of both the development of DM exercises and the actual implementation.

Year	1999		2000			2001			
Month	8	11	3	8	11	3	5	8	11
Main DM Exercises Implemented	Hand-knit Album 1999	Future Plan 2000	Calendar for Year 2000 Calendar for Apr-Jun 2000	Socio-drama 1 Calendar for Sep-Oct 2000	Socio-drama 2 Calendar for Nov-Dec 2000	Future Plan 2001 Calendar for 2001 Knitting Symbols Tryout	Production by Order: Accepting Orders	Production by Order: Delivery of Sweaters	Future Plan 2002 Evaluation of DM Exercises

Table 2: Implementation Calendar of DM Exercises

From the analytical perspective, the main documents used in those DM exercises can be plotted on the two-dimensional coordinate system as below (Figure 4):

Data Collection Procedures

For the data collection of the participants' DM practices in the exercises, we used several methods as below:

- (1) participant observations of DM practices including exercises.
- (2) interviews to the participants.
- (3) examinations of the documents managed by the participants.

Digital photos were mainly used for the analyses because most documents used in the exercises were given back to the participants for reference in the future.

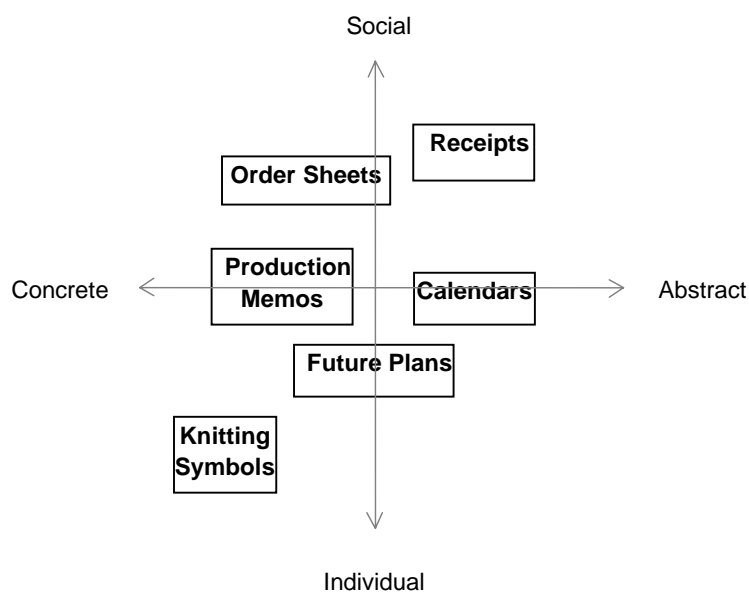


Figure 4: Main Documents used in the DM Exercises from Analytical Perspective

3 Results

3-1 Bilingualism and literacy among the participants

Oral Communication - High fluency in two languages

Interviews with the participants have revealed that they possess rather high fluency in both Spanish and Quechua. Most of them can easily switch between the two languages responding to the requests by the researchers. We also found that Spanish loanwords in Quechua conversation are more frequent than Quechua loanwords in Spanish conversation: ex. about 10% of Spanish loanwords in Quechua conversation versus 2 % in the opposite situation. This fact suggests the overall strong influence of Spanish upon these people¹².

Literacy Skills – Poor manipulation of letters

The paper test and the analyses of the texts for Future Plans have revealed that the participants' literacy skills are rather poor in comparison with their oral proficiency.

First, only a few of them can be qualified as possessing good skills of literacy. Many sentences hang up without completion. Furthermore, there are many errors in orthography, concordance, spacing between words etc. It is interesting to note that they tend to make orthographical errors when asked about conventional spellings without systematic correspondence with pronunciations in Spanish (ex. *división*, *divición*, *dibisión*). This tendency suggests that most participants are not accustomed to even seeing Spanish written texts on a regular basis.

Second, the participants' grammatical competences seem to be less stable in written mode than in oral mode. For example, when asked to put a set of Spanish words in grammatical order (ex. *a mano mejores precios los tejidos tienen*: the correct syntactic order in Spanish is SVO), almost a half of the participants arrange them in the order of Quechua (SOV) or a mixture of Quechua and Spanish (VSO, OVS). This is a rather surprising result, recalling their high capability of code switching during the interviews.

¹² These findings basically fall in line with the views of the precedent studies on linguistic studies on this area (Álbo 1955).

3-2 DM Exercises

Future Plans

Two notable findings of the Future Plan exercises are:

- (1) Bipolar distribution of preferences of representational modes: texts or drawings.

While some participants wrote their plans and/or their desires for the future in Spanish prose text without any drawings, others preferred to make drawings of the knit fabrics they wanted to make without any labeling. This tendency remained almost unchanged throughout our research project.

- (2) Correlation between the preferences for texts and the formal schooling.

The preference for texts above-mentioned is correlated with the prior experience of formal schooling. It could be reasonably conjectured that more formal schooling nurtures higher tendencies to express more in text form. Our statistical test shows that the number of words used in the plan is explained by the year in school with a statistically significant and positive coefficient.

Calendars

Most participants had rarely filled out calendars by themselves before, but they picked up how to do it quickly. Thus, the exercises started to get on smoothly. And yet, it turned out that the participants rarely filled in their long-term sequential activity plans in the calendars. In general, they just wrote in their planned days of absence from the workshop, and they often did not follow those plans. The only exceptions were seasonal trips to rural areas for sowing and harvesting.

The main reason for the inactive use of calendars seems to reside in the absence of the long-term complex activities which would require elaborate planning and coordination in the life in the poor outskirts of the city, rather than the lack of skills to use calendars. In other words, without supporting them to develop plans of, say production of sophisticated knit items, we can hardly expect just a repetition of calendar exercises to yield significant effects on their DM practices.

Sociodramas

The most important finding of the *sociodrama* exercises was the persistence of participants' confused handling of receipts. Many participants failed to fill out items of the receipts appropriately. In particular, some of them did not understand well the format and social significance of receipts (Photo 8). While blank receipts were handed over without signature of the issuer in some transactions, the players in the role of client signed receipts in others. Worryingly, their performance did not improve much in the second *sociodrama* session.

One of the reasons for the poor handling of receipts seems to lie in the difficulty to imagine the long cycles the receipts would go through after the first transaction. In addition, we suspect that it is psychologically difficult for Quechua speaking women to ask for signature to their "social superiors" (the shopkeepers in these cases).



Photo 8: Example of Poorly Filled out Receipts in Sociodrama Sessions.
Original size: 15.0 cm x 10.5 cm.

Tryout of Knitting Symbols

Although most participants had never seen knitting symbols before, they picked up how to read them very quickly (see Photo 1, 5 & 6). In particular, it should be noted that several non-schooled women learned them with much interest and showed better understanding than their more educated peer.

At the same time, it was found that many participants were careless about the minute difference of knitting symbols, which led to the production of inexact knit patterns. It is not a question of perception, decoding skills or knitting skills, but of the sensitivity to the value of exactly realizing planned designs.

Production by Order

Coordination between craft making and DM

In this final exercise, it is highly recommended to coordinate the knitting process using various documents such as order memos, order sheets, new hand-knitting reference book and catalogues, and production memos. While the participants managed to go through all the paperwork in some ways, the examinations of the details revealed that few of these documents were functionally related with the knitting process.

In particular, the drawings and numerical information in the documents were barely consulted by the knitters (Compare Photo 7 & 9). They memorized these data by heart, or consulted each other at each step. They seem to have neglected these DM procedures, because, for one thing, they could not count complicated gauges based upon the numbers provided by the clients, for another, they did not find it useful to use drawings for dealing with these tasks.

The poor written arithmetic and drawing skills can have adverse effects on the finished items, because some dimensions such as neckline can be in danger of being misaligned from the orders. The deviance can be easily aggravated if the specifications are not checked against the data noted in the technical documents. In fact, some parts of most of the finished sweaters did not fit well the order placed by us (Photo 10).

DM for commercial transactions

Although most participants had already practiced the handling of receipts in *sociodrama* sessions, it turned out that some of them still mishandled receipts. They were particularly confused about several items such as “*Recibe*” (“customer” or “sold to”) and “*Por concepto de*” (“item/description” or “product”). Thus, it has turned out to be pretty difficult for them to master how to manage receipts by just lectures and several exercises.

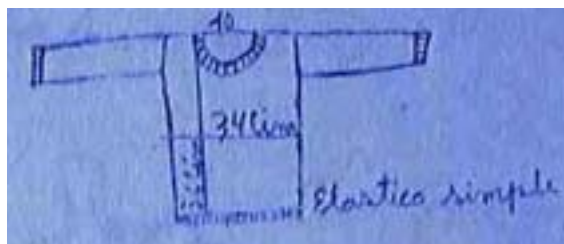


Photo 9: Example of Drafts (Close Up) in Order Sheets Made by the Participants for Production by Order Exercise.

Original size: 6.3 cm x 3.3 cm.



Photo 10: Example of Sweaters Made by the Participants for Production by Order Exercise.

Original size: width = 37 cm, length = 36 cm.
Necklines tend to be narrower than specified in the order memo.

Note also that the shape of armhole is right-angled. The participants could not make detailed drafts with curved lines or calculate gauge count for the products.

Filing for Future Reference

By the end of the project, the participants' filers contained more than a dozen of documents used in the various DM exercises. And yet, only a few of them went on to use actively their individual filers for their personal purposes.

Participatory Methods and DM Exercises

Participatory methods were actively employed by Kazama and Sra. P. in the knitting course during the research project. But their facilitations were barely connected with DM practices by other participants in general. In other words, the explicit effects of participatory methods seemed almost limited to the behavioral aspects of the facilitators and participants.

Therefore, in 2000 we held a session in order to see if the participatory methods and DM exercises could be integrated in a significant way¹³. The participants analyzed the social distance between them and different stakeholders related with the activities of CEMVA by putting various objects on a set of large concentric circles drawn on the ground, then prepared a petition to the local authorities. At the end of the session, each participant copied the figure and text to sheets of paper to file in their individual holders.

The session itself went on smoothly enough, and yet, the documents copied by the participants did not have significant variations each other except for some differences of dexterity. Neither was the copied petitions referred to by the participants after the session. There might have been more significant changes, if we could have spared more energy on this course of activities. And yet, we could not afford it.

3-3 At the End of the Project

As a whole, the results of our DM exercises should be qualified as mediocre at most. In particular, it should be noted that most of the existing practice patterns have not improved significantly throughout the research project: e.g. poor written arithmetic and drawing skills, reluctance to integrate different visual symbols, mishandling of receipts, inactive use of files. And yet, we could notice several signs of sprouting of modest DM practices among the participants.

First, the use of knitting symbols has almost taken root in the knitting course. Second, participants have begun to make use of the monthly fee payments as opportunities for practicing how to handle receipts. Last, but not least, a few of them were recruited as assistant of the workshop, and started to take over DM exercises on their own initiatives with Sra. P., our trusty facilitator, as the key figure. It was an agreeable surprise, because we had not expected that the participatory methods and DM exercises could be integrated in such a way.

3-4 Summary of the Findings

The DM exercises have shed light on the current DM practices of the participants of the knitting course from multiple perspectives.

Uneven distribution of skills of, and preferences for visual symbols among the participants

Whereas most participants already possess basic skills of reading and writing Spanish texts, their skills of written arithmetic and drawings are still poor. Correspondingly, they prefer almost always the textual representational mode to other modes, irrespective of situations. It is interesting to note that the preference for textual representations tends to correlate with the years of formal schooling.

Lack of cyclical perspectives in the participants' DM practices

Regardless of the choice of representational modes, the participants' DM practices tend to occur only with makeshift visions. First, at the individual level, they barely refer to documents for coordinating their activities in the workshop, whether the schedules or technical specifications are concerned. At the more social level, the lack of cyclical perspectives can cause serious effects. For example, it has turned out that many participants mishandled receipts in our DM exercises. More importantly, their repeated failures suggest that it is difficult for them to realize the significance of receipts by lectures and several exercises.

In brief, most participants master DM skills of concrete nature and for individual purposes rather quickly. And yet, it seems more difficult for them to master DM skills of more abstract nature and involving social interactions of larger scales (Figure 5).

¹³ Cf. REFLECT approach by Actionaid: <http://www.reflect-action.org/>.

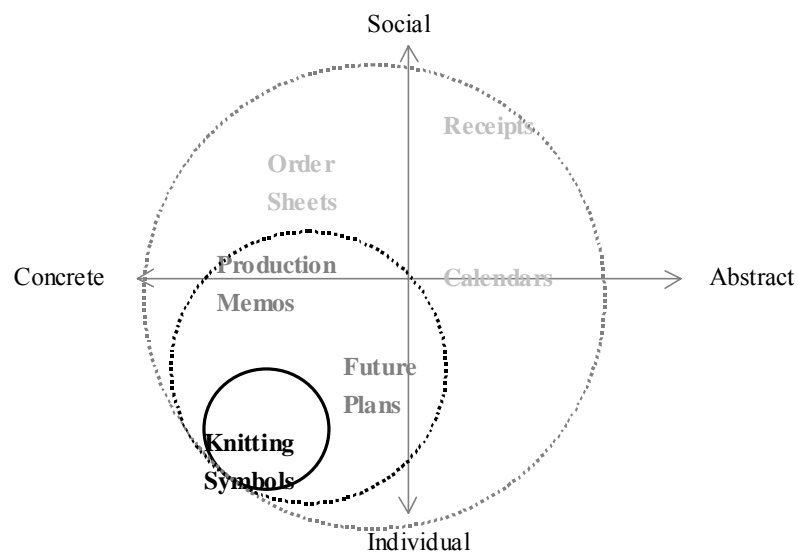


Figure 5: Schematic Summary of the Major Tendencies of the DM Practices of the Participants in the Knitting Course

3-5 Suggestions for the Future

While our DM exercises served pretty well as diagnostic tools, their effects as pedagogical tools were rather limited. As a whole, the above tendencies remained almost persistent throughout the research project. However, we should also note that at the more micro level we could notice a few positive outcomes. Thus, the results of the performances have provided us with several useful suggestions for obtaining more fruitful outcomes.

Importance of high-quality documents

One of the most significant outcomes of the DM exercises was the popularity of knitting symbols among the participants. Although the editing process was complicated, time-consuming and required outside helps (such as experts of knitting, translators, editorial house etc.), the results were eminently worthy of troubles. The new reference book has become one of the rare documents constantly referred to in the knitting course now.

Starting with the DM practices close at home

We think that one of the reasons for the success of the above reference book was its proximity with the participants' daily activities in the workshop: hand knitting. In other words, if the contents are not relevant enough to their daily life, the documents cannot be expected to get into a constant and dynamic cycle easily. This is especially true for "illiterate" and "semiliterate" people, because their concepts of document cycles are too rudimentary and/or vague to apply to unknown spheres (Figure 5). Thus, policy

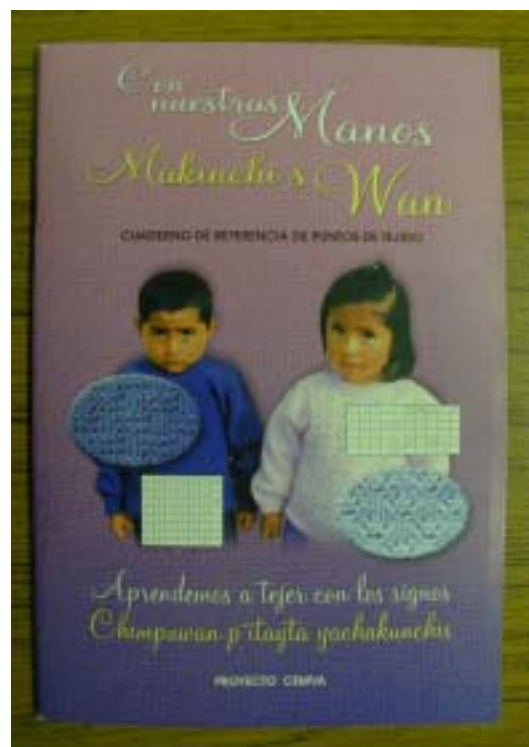


Photo 11: Front Cover of the New Hand-Knitting Reference Book, *Con nuestra manos / Makinchiswan*.

The models are children of the participants of the knitting course. They wear, of course, the sweaters knit by their mothers. See **photo 6** for the main pages. Price =10 Bs. Original size: 21 cm x 31 cm.

focus in general should have a two-pronged goal: consolidating easily-attained DM skills in concrete and individual spheres, and developing gradually new DM skills toward abstract and social spheres. Certainly, well-functioning document communities should have high DM skills in all spheres. But, we believe the consolidation of easily-attained DM skills is very important.

Hand-knitting as a good entry point for effective DM practices

Hand-knitting is a good entry point for effective DM practices by the poor for a number of reasons such as low cost, easy to practice, “error proof”, providing multiple opportunities and useful. If the participants have knitting needles, balls of yarn and a small space to sit down, that’s enough. They can reuse the yarn repeatedly. Furthermore, they do not have to be extremely strict when knitting, because knit clothe is highly elastic (about 10% in general). Imagine the case of needlework for example. Last, but not least, their family members can wear the products they finished. It is a nice and lovely advantage, too.

Efforts to link the workshop activities and those outside

A remarkable fact among all the DM exercises is that the handling of documents related with commercial production (e.g. receipt) has attracted attention of many participants. This is well understandable given the reasons why they come to the workshop: earn money by their craft skills.

In fact, many of them have failed to handle commercial documents repeatedly. These role-play type exercises have brought to light their weak points that would not be noticeable in ordinary knitting activities in the workshop. The repeated failure can serve as a hint for setting forth the guidelines for their long-term goals.

Quick feedbacks and constant repetition

As is shown in the results of different DM exercises, the relevance of DM for the participants is not always direct or simple. One of the crucial points of mature DM practices is the flexibility in dealing with the ever-changing situations. In order to acquire the mature DM skills, it is indispensable to go through diverse DM practices repeatedly, which is difficult for “illiterate” and “semiliterate” people in their daily lives. Trial and error experiences are very worthwhile. It is very important for them to have chances to fail to handle documents safely. Therefore, it is highly desirable that DM exercises in NFE institutions be repeated constantly with quick feedbacks after each exercise.

Limitations of DM exercises

We think that the above-mentioned points are indispensable for effective implementations of DM exercises in NFE institutions for the poor. And yet, we should bear in mind that there are also several conditions beyond the control of the local NFE institutions. First, the availability of high-quality documents for the NFE learners largely depends on the market and policy makers. Our new reference book production should be considered as an exceptional attempt for demonstration. Although it is desirable to make further volumes of reference, it is beyond the capability of ordinary NFE institutions such as CEMVA to produce those documents.

Second, we conjecture that the repeated failures to handle commercial documents by the participants of the knitting course could be attributed to the social situations such as racial discrimination as well as to their immature DM skills. Knowledge of local social structure might be complementary to findings based on DM practices.

Third, various hazards in the markets are preventing vocational training from culminating in income generation. In promoting micro enterprise-oriented DM exercises, public policy should pay attention to removing obstacles. It is certain that DM exercises could eventually result in higher-quality knitting products. But, much remains to be done for income generation. There is much room for further thought experiments and real experiments before we understand how DM exercises can lead to successful DM practices in commercial transactions outside of the workshop.

Conclusion

In this project, we approached to what are generally called "functional literacy" issues of non-formal educational sector in Bolivia from the document management (DM) perspective. We think that the concept of DM is effective in the following aspects.

Diagnostic Tool based on Document Management Perspective

The findings of our research project shed light on the down-to-earth problems of "functionally illiterate" people from multiple aspects. In the case of the knitting course in CEMVA, we found various problems such as poor drawing skills, bias toward letter use, lack of long-term document cycles, difficulty in handling contractual documents. While some of these problems are related to the participants' manual skills and/or the quality of the documents currently used, others are linked with social dimensions such as poor development of Quechua as written language, social status of Quechua speaking women.

Learning Tool based on Document Management Perspective

Those above-mentioned findings can be used to improve current non-formal education learning programs by introducing effective DM exercises. Our approach could focus on operational questions such as what type of DM practice is beneficial as well as appropriate to a specific livelihood training. In our case of knitting training, an adequately elaborated knitting manual proved to be a good entry point in welcoming "illiterate" participants in initiating DM. Our case also shows that *sociodrama* (for example, receipt use) could be a useful DM exercise in advocating daily DM needs. Apart from the knitting, our approach could reveal what type of DM practice is suited to each livelihood training.

As such, DM exercises can serve both diagnostic and pedagogical purposes. It does not mean that there is (or will be) an all-purpose manual for DM exercises. In fact, DM exercises are evolutionary. They should be constantly customized for the particular situations by taking into account the findings from prior exercises. In our case, the analysis of the existing hand-knit albums has led us to an editing of a new hand-knitting reference book which was used in the following DM exercises. Some of those exercises such as the use of knitting symbols have become daily practices among the participants by the end of the project.

Thus, some kinds of document cycle have gradually developed in the knitting course in which various DM exercises were tested during the course of the research project. Both our research activities and the integration of several DM exercises with knitting activities by the participants have constituted a highly complex process of the development of document cycles in the knitting course.

The research project itself came to an end at the end of the year 2001, mainly because of the termination of funds and non-availability of human resources for further joint research. However, the workshop continues its activities, so do their document management practices. We can never say that we could fully establish some useful document management practices in the knitting course. It is partly because of our insufficient capabilities. However, it is also true that document management practices are an endless process of habituation, obsolescence and innovation.

The joint research has provided the research team with a number of significant findings and insights that enrich our understanding of the complexity and dynamism of document management practices in the real world. We hope that the participants of the knitting course have strengthened their skills and self-confidence for making their way through this document-flooded world. Almost all the people on earth are faced with the same situation as they are: we are continuously struggling to acquire particular tools for better life. And, these tools must function socially. When we develop trust in ourselves and in other people with whom we communicate via documents, the document management deserves special efforts in acquisition and further elaboration.

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