A CURRICULUM DATABASE FOR THE CANADIAN ADULT LITERACY COMMUNITY: PRELIMINARY TECHNICAL AND EDUCATIONAL CONSIDERATIONS

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Introduction

As a method of managing, manipulating, and providing access to information, electronic databases are an invaluable tool. This is especially true in situations where multiple data are used in different ways by a variety of users, as would be the case in the Canadian adult literacy community. A national level, online curriculum database would allow adult literacy practitioners across Canada to easily, inexpensively, and quickly locate and download curricular material as needed. This paper will explore the technical and educational considerations involved in such as database, and the reasons why one would be of great benefit to the field. Miller and Seller's (1990) notion of meta-orientations and their importance to the development process are discussed. The paper will conclude with a preliminary design and recommendations for development of the database.

Adult Literacy Teaching and Learning

Adult literacy learners are different from other student populations in several respects. Unlike most other educational venues where students come together for a common purpose, with similar levels of ability and experience, and at specific times and locations, literacy programs accommodate learners who start at various times throughout the year (rather than start and end on a particular date as a group), and have limited/varied times that they are available to learn due to employment and/or family constraints. While some learners are available to learn on a full-time basis and during regular hours, most are only available part-time and at odd hours due to parenting and employment. Learners also vary widely in their abilities. At any one time, a program may be dealing with a mix of beginning, intermediate and advanced students, who also vary in the strength of each literacy skill (e.g., may be a strong reader, but a less than confident writer and beginner as far as numeracy and computers go). In some cases students can be organized into groups, but often learning must take place on a one-to-one basis.

As depicted in Figure 1, the curricular needs of adult literacy learners are also very diverse. Some learners want to improve their literacy skills in order to go back to school, while others may want to get a better job. Still others may wish to get more involved in helping their children with their homework or simply to participate in daily life with more ease. Whatever the reason, the end result is that in response to these diverse needs, different types of literacy programs have developed. The two main curriculum approaches include subject-oriented and theme-based.

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┌─────────────────────────────────┐
│     ADULT LITERACY CURRICULUM     │
└─────────────────────────────────┘
        │                      │
   (Subject-Oriented)      (Theme-based)
        │                  │            │
┌──────────────┐  ┌──────────────┐  ┌──────────────┐
│  Academic    │  │ General Focus│  │ Specialized  │
│  Upgrading   │  │ - Employment │  │   Focus      │
│ - Adult Basic│  │ - Finances   │  │ - Family     │
│   Education  │  │ - Citizenship│  │   Literacy   │
│ - General    │  │ - Health     │  │ - Workplace  │
│   Educational│  │ - Parenting  │  │   Literacy   │
│   Development│  │ - Citizenship│  │ - ESL        │
│              │  │ - Etc.       │  │ - Etc.       │
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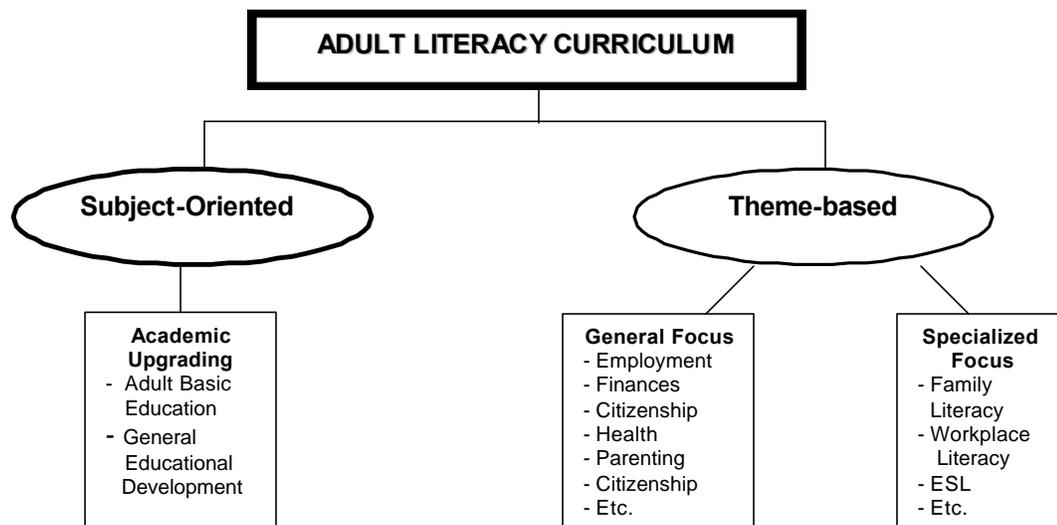
Figure 1: Types of Adult Literacy Curriculum

Approximately one-third of adult literacy programs are dedicated to academic upgrading and are organized around the subjects of the elementary/secondary school system. The remaining two-thirds use a theme-based approach in which literacy skills/knowledge are framed against the life roles of adult learners (i.e., worker, parent, community member, etc). As Dirkx & Prenger (1997) suggest, "Literacy educators have long recognized that relating instructional content to the specific contexts of learners' lives and interests increases motivation to learn" (p. xii). Programs that utilize a theme-based approach can be loosely divided into two categories: a) *general* and, b) *specialized*. The former are open to any adult and focus on improving literacy skills in general while the latter are directed at a particular group and have a specific focus. The most common of these include:

- family literacy - offer literacy instruction, as well as parenting education and training

- workplace literacy - geared toward employment in general or to a specific type of employment

- culturally specific programs - frames literacy around the language, history, traditions, etc., of a particular culture (e.g., Aboriginal, francophone)

- life skills - offers a combination of life skills and literacy instruction for certain at-risk populations such as inmates in correctional facilities.

- English as a Second Language (ESL) - combine literacy and English language instruction.

There is a great deal of overlap between general and specialized theme-based curricula. For example, much of the same material will be taught in a family literacy program as is covered by a general program using a parenting theme with learners. This is an important point in that electronic databases allow the same material to be used in a different ways by a variety of users much more easily and effectively than do print-based resources.

Curriculum Development in Adult Literacy

Historically speaking, adult literacy curricula are developed at the local or program level rather than by a centralized regional, provincial or national level organization. Although some exemplary projects have resulted, no overarching plan at the national level exists to bring together disparate resources in a coherent and useful way. This results in duplication of effort, piecemeal production, and a wide range in the quality and relevance of material. In addition, the lack of ongoing, collaborative curriculum development efforts has meant that the knowledge base of the field has not evolved beyond a somewhat basic level.

Other interrelated factors also contribute to the uneven quality of curricula. First, the field is predominantly volunteer-run (approximately 70%). As such, the available practitioner expertise and time needed for the development process is very limited. While experience and dedication is plentiful among available practitioners, the field can best be described as para-professional in terms of training and certification. Some provinces/territories are much stronger in this regard than others. However, overall the standards of practice are quite uneven and somewhat limited. Expertise is also limited in the sense that there is minimal contact and dialogue between adult educators and practitioners, thus reducing the flow of information from theory to practice and vice versa.

Second, in addition to a limited number of trained, full-time staff, the field suffers from an ongoing scarcity of financial resources. Although a federal government organization -- the National Literacy Secretariat (NLS) -- does provide funding for various projects including those relating to curriculum development, the adjudication process for project funding is heavily dependent on recommendations by the provinces/territories as adult literacy falls under their jurisdiction. Shohet (2001) suggests that despite the fact that "this jurisdictional right is jealously guarded" many provinces/territories generally give adult literacy short shrift:

> *Overall, although there are some provinces with a stronger commitment to adult literacy than others, there is general agreement among researchers that, until now, provision has been uneven and unsustained in many parts of the country.*

Finally, literacy organizations are isolated from one another both geographically and administratively speaking. This makes it very difficult logistically speaking for

stakeholders to engage in collaborative activities, a situation which is exacerbated by the scarcity of resources, financial and otherwise. This is not to argue that greater centralization and government involvement is needed; quite the contrary. There is great (and many would argue, justifiable) by those in the field that were governments to play a larger role, invariably economic related concerns would be pushed to the forefront at the expense of the humanistic values underlying the field. The proceedings from the Fifth International Conference on Adult Education in 1997 caution against the proclivity of governments to orient literacy to economic:

> *A commitment must be made to literacy as a human right. Appropriate resource allocations must be made for adult literacy promotion in all societies without expectation of merely economic returns. Cultural and political consequences must be taken into account as well. The discourse of the market should not be allowed to undermine the concept of literacy as a social good (Literacy for Tomorrow, 1999, p. 14).*

Electronic Databases

As Quigley (1999) suggests, one thing that is clearly missing is a *means* by which stakeholders in the adult literacy community can share knowledge more easily and efficiently:

> *If adult literacy practitioners are to engage seriously in a clearer articulation of their own reality, and in critical discourse concerning their own field, improved ways need to be found to create and distribute critical knowledge to guide this field ...* (p. 254)

In this regard the benefits of an electronic database would be tremendous. First, databases are efficient and cost-effective in terms of the creation, storage, location, manipulation updating/amending and maintenance of information. Second, a database that is available over the Internet would be particularly useful in that practitioners across the country would be able to access curricular material easily, quickly and inexpensively. This would substantially reduce the strain that developing, searching and/or purchasing material currently places on individual programs. In turn, energy, time, and finances would be freed up for redirection to other areas (e.g., the purchase and maintenance of computer software and hardware). Third, it is quite reasonable to suggest that the standard of teaching and learning would improve across the board in with the provision of (near) universal access to high quality curricular material, and that duplication of effort would be significantly reduced. Finally, the knowledge base of the field would likely evolve beyond a basic level in that curricular material would be shared to a much greater extent (and thus not duplicated, but built upon/refined in successive iterations).

A database can be defined as a "structured collection of similar data" (Garrison & Fenton, 1999). Various types of information can be stored in databases including text (full text as in journal articles, books, discussion forums, or partial text such as library catalogues), numerical information (e.g., statistics), and/or multimedia (e.g., audio, video). There are four main types of databases: *flat file*, *relational*, *object-oriented* and *hybrid*. The most sophisticated of these is the object-oriented database followed closely by the hybrid (i.e., a mix of object-oriented and relational database features). Lozano (1998) suggests that they will become the norm at some point in the future. However, for now he writes   "we will stick with Relational Databases for a long time to come" because they are "mature" and cost-effective. Both object-oriented and hybrid databases are rather immature and expensive at present. In view of this, and the fact that flat file databases do not handle anything but simple data, this paper will focus on relational databases.

Within a relational database, different types of data are grouped into *fields* or identifiers such as learner level or grade, academic subject or educational theme, specific topic, type of activity, etc. Each piece of information for a particular field is stored in a record in tables. The relationships between data in tables can be described as *one-to-one* (i.e., each record in a table is linked to one record in another table), or *many-to-many* (multiple records in one table are linked to multiple records in another table). The first task when creating a database then, involves identifying the different data fields and developing a *data dictionary* that defines or describes each field. The resulting fields must then be associated with one another in some way and it is the task of the d*atabase administrator* to create maps that represent these relationships. The process is termed *data-modeling* and requires extensive input from end-users to ensure that the database is maximally relevant and useful.

There are three basic types of *operations* that can be performed on tables within a database: a) retrieve a subset of columns (e.g., all learning units for beginner literacy students, b) retrieve a subset of rows (e.g., all learning units for beginner literacy students in the area of numeracy), and/or c) combine a subset of rows and columns (learning units for beginner literacy students in the area of numeracy, specifically activities relating to long division). The majority of curricular databases available on the Internet currently are designed for elementary/secondary education and allow users to search for lesson plans in a specific subject area by grade level and/or keyword.

Databases may be distinguished by whether they are web-based or off-line. This paper is concerned with web-based databases, which allow users to request, view and manipulate data via the Internet. As pictured below, the physical or technical components for an online database are relatively straightforward. They include the *database* itself, a *web server* to store and manage files (e.g., *Windows NT*), *database connectivity software* (e.g., *Cold Fusion*) to process user requests between the web server and database, and a *web browser* (e.g.,

Netscape Navigator, *MS Internet Explorer*) to request and read the information in a database.
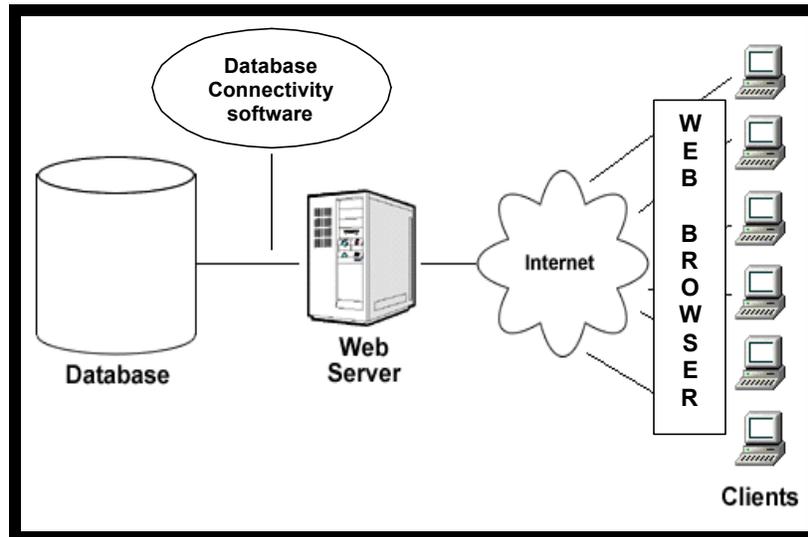

Figure 2: Components of an Online Database

A database management system (DBMS) is required to create the database and manage the information stored within it (e.g., *FileMaker*). This type of software program assist with:

- designing the database structure
- creating the data entry forms required to input information into the database
- validating the data entered
- checking for inconsistencies
- sorting and manipulating the data in the database
- querying the database (that is, asking questions about the data)
- producing reports (GeekGirls, 1998)

This section has provided an overview of databases from a technical perspective. The next section will address the education considerations involved in the design, implementation and maintenance of a curriculum database.

Educational Considerations

Major decisions about curricular content and process should fall out of one's view of the nature and purpose of education. That is, one's curriculum development model must be in line with what Miller and Seller (1990) refer to as one's "meta-orientation." These meta-orientations include: a) the transmission position, b) the transaction position, and c) the transformation position. They contend that these positions drive curricular content and process, but are often implicitly held and

not outwardly discussed by those responsible for developing curricula. As the description of each position will illustrate, if developers do hold different positions but do not make these explicit, they will ultimately work at cross-purposes in that they will be coming at the process from very different perspectives.

The objective in the *transmission* meta-orientation is to "transmit facts, skills, and values" (p. 5). That is, skills/knowledge are broken down into subjects or disciplines (e.g., mathematics, geography, history), divided into small units, and transmitted by teachers to learners in a sequential manner. Competence in specified objectives for each subject or discipline is measured using criterion-referenced tests. Historically speaking, elementary/secondary education has been dominated by this meta-orientation (Bailey, 1997; Cavanagh, 2000; Dirkx & Prenger, 1997; Little, 1992; Miller & Seller, 1990; Orlosky, 1978; Schwab, 1977). As touched on earlier, approximately one-third of adult literacy programs have a subject orientation and subscribe to the transmission position.

The remaining two-thirds of programs are predominantly concerned with personal and/or social change, or what Miller and Seller refer to as the *transformation* position. This particular area of education grew out of a "grassroots movement" in which communities organized programs for the express purpose of assisting individuals to improve their literacy skills. In that low socioeconomic status and poor literacy skills very often go hand-in-hand, it was soon recognized that education in other areas related to personal well-being and/or the social good was required. As Figure 1 highlighted, a multitude of programs types developed to meet these diverse needs, their common thread being personal and/or social transformation.

Miller and Seller refer to the third meta-orientation as the *transaction* position in which the focus of education is on developing a learner's cognitive abilities (i.e., critical thinking, problem-framing and solving). This meta-orientation is common in higher education, but has not been of as great a concern in other areas of education. This is changing in many areas, including adult literacy. Whereas in the past the definition of literacy was fairly simplistic (i.e., one could read and write or one could not), it has necessarily evolved based on the integration of technology into North American life and resulting information explosion:

> *The level of literacy required to function in everyday life is constantly shifting upward.... The key policy question is how to help all citizens to develop, maintain and continuously advance their literacy skills in order to live and learn in a knowledge-based and information-intensive society.* (*Literacy for Tomorrow,* 1999, p.14)

Thus, newer definitions of literacy focus on how well or poorly an individual *deals with information.* That is, one's literacy level is determined by the ability to locate, understand, evaluate, utilize, and/or convey information, numerical, graphical and/or text-based, in various contexts including home, work, education, and the

community (*Literacy for Tomorrow*, 1999; Meyer & Rose, 1999, Shalla & Schellenberg, 1998). As a result, increasing emphasis by the field of adult literacy is being placed on critical thinking, problem-solving, and communication skills.

Miller and Seller's (1990) meta-orientations are very useful in capturing the pluralistic curricula of adult literacy. They allow those involved in the development process to determine the nature and purpose of the curriculum. That is, while some material is best transmitted (e.g., the mechanics of reading or writing, mathematical operations), other material regards a student's personal growth and is best suited to a transformative approach (e.g., literacy skills framed against authentic themes such as parenting, employment, citizenship). Still other material will concern learners' cognitive development (e.g., problem-solving, critical thinking), and is suited to a transactional approach. Explicitly framing material by position ensures that the remainder of the development process and its components are in line with the overarching meta-orientation.

Miller & Seller (1990) offer a flexible curriculum development model that begins with identifying meta-orientation. It is beyond the scope of this paper to go into detail regarding the steps. Suffice it to say that the basic stages include developing goals/aims/objectives, determining teaching strategies, and developing plans for implementation and evaluation. What is crucial is that decisions at each stage be congruent with the meta-orientation taken, something the model addresses throughout.

A Preliminary Database Model

As Figure 3 depicts Miller and Seller's (1990) meta-orientations are useful for anchoring the database.

MAIN MENU	MAIN CHOICES	SUB-CHOICES (DROP DOWN MENUS)		
Position	Transmission	**Subjects** - All/any - Mathematics - Language Arts - Science - Geography - History - Etc.	**Topics** Specific to each subject.	**Lesson Plan** Specific to each topic.

		Core Literacy Skills	Topics	Lesson Plans
		Core Literacy Skills • All/Any • Reading • Spelling • Numeracy • Technology • Communication (writing, speaking, listening)	**Topics** Specific to each skill area and dealing with the mechanics or operations involved in these areas.	**Lesson Plans** Specific to each topic.
	Transformation	**Themes** - All/any - Life skills - Consumer Education - Family /Children - Etc.	**Topics** Specific to each theme area.	**Lesson Plans** Specific to each topic.
	Transaction	**Cognitive Development** - All/any - Critical thinking - Problem -solving/ framing - Planning and organization - Analysis - Etc.	**Topics** Specific to each process.	**Lesson Plans** Specific to each topic.
Level	-Any/All - Beginner - Intermediate - Advanced			

Figure 3: Preliminary Adult Literacy Curriculum Database

The above model is intended to be a jumping off point for the development process rather than an exhaustive treatment of curricular components. This is due in part to the limited scope of this paper, but also to an underlying belief that the development process must be an inclusive one rather than the sole purview of scholars (Schwab, 1977). That is, all who have a stake in the curriculum need to be a part of the development process (e.g., practitioners, academics, students, and community/political representatives). This ensures that the curricula are "coherent" or maximally useful and relevant (Beane, 1995). In the case of the proposed database, the process would begin with a deliberation of the overarching or macro level issues (e.g., "Is meta-orientation the most appropriate/useful way of capturing the pluralistic curricula of adult literacy?"), and proceed to the micro level (e.g., designing a standardized template for lesson plans). Following decisions regarding design issues, the process could

then be used to review existing material, refine and/or reformat it as required, and integrate it into the database. Gaps could then be identified and new material developed where necessary.

Recommendations for Further Development

According to Ashenfelter (1999) and others (McFadden & Mullen, 1997; Sullivan, 2001; Thorne, 2000), successful databases have in common several factors including endorsement from the organization's leaders, solid leadership throughout, extensive input from stakeholders, ongoing training and support in use of the database, timely and relevant content, a format that is easy to use and understand, and rich searching features. Key among those factors listed above in this instance will be sponsorship/leadership by a national level organization. Unlike the business organization or formal education system in which there is a well-established administrative infrastructure, the literacy community is only loosely linked together by regional coalitions and modestly supported/overseen by provincial government agencies. Thus, a driving and unifying force is crucial in this instance.

The most logical choice for at least warehousing the database would be the National Adult Literacy Database (NALD), a not-for-profit organization funded by (but at arm's length from) the NLS. It has the technical staff and necessary computer software/hardware to coordinate such an endeavor already in place. However, in that NALD is a repository (versus clearinghouse) for adult literacy resources, it does not have experienced curricular specialists on staff. Thus, a curriculum development cell would need to be created that would be responsible for coordinating the design, development, implementation, evolution and maintenance of the database. Its main function would be to recruit and coordinate stakeholder teams that would be drawn from literacy organizations and programs, adult educators and representatives from provincial/territorial governments. As discussed in an earlier section, exemplary material is available that could be reformatted and integrated into the database while other material of a less coherent quality could be refined. The curriculum deliberation process would also allow the field to work together to identify gaps and develop new material as required.

In that face-to-face collaboration is next to impossible for the adult literacy community, especially on a large a scale as would be required for the development of a database, it may be to technology that the field needs to turn once again. It is conceivable that computer-mediated communication (CMC), specifically asynchronous discussion forums, could be used to bring stakeholders together. Not only do online forums inexpensively bridge time and distance, the research literature suggests that (asynchronous) CMC is particularly conducive to the type of reflective discourse that would be required in a deliberation process (Anderson & Kanuka, 1997; Bereiter, 1994; Bereiter, Scardamalia, Cassells & Hewitt, 1997; Hawkes, 2001).

Conclusion

The development of a curricular database for the adult literacy community must necessarily be undertaken by a pluralistic group that includes curriculum specialists, technologists and stakeholders. As Martin (1981) emphasizes, "The more thinking, iteration, and interaction with the users that goes on before a database is implemented the better the final product will be" (p. 52). Many database projects have experienced a very bumpy road to implementation due to users' reluctance to expend the necessary resources (i.e., time, energy, financial) at the front-end of the project (McFadden & Mullen, 1997; Porter & Rome, 1995; Thorne, 2000). While many of these projects involved large-scale business or academic databases tasked with multiple operations, the lesson is one best heeded by those in the area of adult literacy. Although a curricular database would be cost-effective and efficient, especially for this particular community, it must be appreciated that this endeavor cannot be entered into lightly in that it will require deep commitment and ongoing effort by all those involved. As McFadden & Mullen (1997) suggest, "Like highways, data are resources and assets that need constant maintenance, renewal, and development" (p. 9).

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