Building the *Portes ouvertes* CD-ROM

Christopher M. Jones and Judith Frommer

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Abstract

The *Portes ouvertes* CD-ROM was produced as an integrated part of a first-year method for elementary French of the same title. The method itself was created by a five-person authoring team including Margaret Haggstrom of Loyola College in Maryland, Judith Frommer and Marie-France Bunting of Harvard University, Laurent Patenotte of Philips Exeter Academy and Christopher M. Jones of Carnegie Mellon University, and published in 1998 by Holt, Rinehart.

This article details the design and production of the CD-ROM, with reference to video and textbook elements where such reference is indispensable to an understanding of pedagogical foundations.

Christopher M. Jones is Director of the Language Learning Resource Center and Senior Lecturer in French at Carnegie Mellon University. His professional activity is divided between the study of French culture and involvement in a variety of multimedia development projects. He is currently co-director (with G.Richard Tucker) of a multi-year project funded by the Andrew W. Mellon Foundation to deliver basic French and Spanish instruction on line.
Judith Frommer is Professor of the Practice and Director of Language Programs in the Department of Romance Languages and Literatures in the Faculty of Arts and Sciences at Harvard University and is a Member of the Faculty of the Harvard Graduate School of Education. In addition to second language acquisition and methodology, her interests include French language and civilization, and the use of technology in language instruction. She has developed authoring systems and CD-ROMs. Her most recent publication, of which she is a co-author, is "Portes ouvertes: An Interactive Multimedia Approach to First-Year French."

**Statement of design philosophy/background**

At the most basic level, the attraction of multimedia CD-ROMs is their capacity to deliver simulations of a large number of the components of human language use, even those requiring creative synthesis. For example, students can practice imitative sound production, sound distinction and oral free response, aural and text comprehension, and short or extended written discourse. Additional advantages are instructional design elements such as the capacity for interactivity, for the integration of authentic media in learning contexts, and for self-structuring and self-pacing of the learning experience by students. The ability to furnish this sort of learning experience to students outside of a structured classroom environment is an exciting prospect, and one which did not effectively exist prior to the evolution of interactive multimedia within the last decade.
Context of project to be discussed

Portes ouvertes began its design phase in 1992, with a unique premise: that the method would be based on video of interactions of French native speakers in their home environment, role-playing themselves. Other pedagogical keys were an emphasis on communication, on task-based learning, on varied learning modalities and strategy training, on contextualized activities, and on representing the diversity of francophone cultures within France itself.

In contrast to many multimedia projects, Portes ouvertes benefited from the funding inherent in a commercial context. The publisher financed equipment and travel, both for obtaining source material and for executing the CD-ROM itself. On the other hand, there was little in the way of technical support. It was immediately obvious to the author team that textbook design and production (including editing, proofing, graphic design, photo research, etc) were integrated into a well-oiled machine, while the elements of CD-ROM production were still being learned by all concerned during the process of the creation of the Portes ouvertes CD-ROM. During one memorable production meeting, of seventeen people present from the publisher, one was concerned with the CD-ROM and had the sole responsibility of receiving the finished product, testing it, and contracting its duplication. All the others present in the room had very defined roles relative to textbook production.

Although both the authoring team and the publisher saw the CD-ROM as being important to the method’s success, they were not quite sure how to deal with it. Jones was flown to San Diego, for example, to discuss some early un-compiled templates in Macromedia Director with a small publisher-affiliated multimedia company there. The company did not own a copy of Director,
however, and had to scour the San Diego region to find one on a Saturday so that the project could be discussed. Today a multimedia company without Director would be like a fruit company without fruit, but at the time standards were still being defined, and knowledge of standards was seeping slowly into the text-oriented ranks of the publishers.

Another aspect of the project was the geographical distribution of the authors. Though we met relatively frequently, the de facto center of operations was the hard drive of Jones' Macintosh in Pittsburgh. Using Fetch, design and media files were deposited and retrieved via the Internet from Cambridge and Baltimore on the hard drive. This actually worked well, unless the drive crashed on a crucial weekend.

**Content constraints/advantages**

While Jones began working on templates for the CD-ROM using Macromedia Director as early as 1993, the introduction of real content did not begin until two years later. In the summer of 1994 members of the authoring team went to Besançon, France and shot Hi8 video for a total of six weeks, beginning with a local contact known to Patenotte and working through introductions and acquaintances to enlarge the group of informants, which grew to more than thirty. Effort was made to ensure that our group of informants reflected the class and ethnic diversity of France itself. All informants, many of whom were unknown to us before the trip, volunteered their time and effort in support of our project. Segments of video were shot to illustrate the previously designed scope and sequence of the text, but at no time were informants given scripts or asked to avoid certain grammatical structures.
The team shared the understanding that the video was the primary building block, and that ultimately the structure of the method would depend on our native informants and their lives and concerns. Patenotte and other team members also shot hundreds of slides of Besançon and the surrounding area, as well as of Neuchatel in Switzerland and of Paris. To these were added realia and additional photos, illustrations by artists hired by Holt, and audio recordings of other native speakers effected at Carnegie Mellon and Loyola. The result was the happy one of having a substantial number of media resources which where wholly owned by the project and could be used in whatever fashion we saw fit. There were occasional cases where the video or sound quality was not up to acceptable standard and valuable video footage was lost, but the team felt that the advantage of having captured natural, unrehearsed speech outweighed the failings of our skilled amateur production values.

For Jones, who was the Director programmer and primary designer of the CD-ROM, there were occasions when it was obvious that the CD-ROM component was still a second-class member of the ensemble. For example, illustration fell behind schedule for the text. The illustrator was then told she could no longer do requested illustrations for the CD-ROM. A second illustrator was assigned for the CD-ROM whose style was much less compatible with 8 bit (low quality) reproduction. Having a common media base was desirable from the integration standpoint, but it also meant that often nothing could be done in terms of exercise production until final decisions had been made about the video. On occasion, changes were made in the video after full-fledged Director exercises had been produced with a prior version of the video. These inconveniences were perhaps inevitable in attempting to produce an integrated method.
**Technical constraints/ advantages**

The CD-ROM medium itself has intrinsic limitations, among them being speed and storage capacity. At the time the project was planned, the single-speed CD-ROM drive was still in extensive use, with the double-speed drive becoming the standard. Drive speed has a direct impact on the quality of video one can expect: the higher the speed, the greater the data transfer rate and consequently the more information one can use for each frame of a video sequence. This increase in quality might take the form of a larger image, a more forgiving compression algorithm, or higher sampling rate. The consequences of being too greedy with the video can be very disturbing for the end user—dropouts, freezes, inconsistent functionality generally—so the data rate needed to be monitored carefully during digitizing to guarantee reasonable use on machines with low-end (2X) drives. Recent gains in compression (especially Sorenson video) would have allowed for higher-quality video with less storage demands, but decisions must unfortunately be made according to the tools at hand and in wide use, not with ideal or future tools.

Similarly, a decision was made to accommodate the large number of 256-color monitors (especially on the PC side) with an 8-bit standard for art, photos and video. At the time, it would have been impossible to do otherwise. Even using a basic standard for video compression and 8-bit graphics, the storage demands required two CD-ROM discs. The publisher was very unwilling to consider additional discs, for reasons of production expense.

The use of Macromedia Director as the authoring environment meant a steep learning curve on the one hand, but on the other the ability to do most anything that Jones and Frommer could
imagine in terms of exercises. Many of the more creative exercises would have been difficult using any other tool. Director is very CPU-intensive even by itself, however, meaning that exercises which required extensive operations or media handling tended to be quite slow for the user. These concerns have evaporated with successive versions of Director, and especially the explosion in processor speed. Exercises that were painfully slow to load and execute on a 33MHz machine, now snap through without a hint of delay.

The cross-platform demand, which became standard during this project, was theoretically resolved by the use of Director. In fact, though the Mac version was stable early on, the Windows version required extensive adaptation by Roger Van Scoy, a free-lance Director developer from Pittsburgh. There were problems with text, color and media handling which were not trivial, in spite of Macromedia’s promises.

Testing was also an issue. Jones recommended early on that the beta version of the CD-ROMs should be submitted to an external testing bureau. Since these cost roughly $1,000 per day, however, the publisher decided to do the testing internally. The internal tester was relatively inexperienced, resulting in anomalies like not testing the record function on the PC before production because no microphone was available.

**Design and Production narrative**

As mentioned above, the textbook/video process was intertwined with the design and production of the CD-ROM. Early design meetings for both usually included some discussion of the type of activities to be included on the CD-ROM, and whether they would duplicate or extend classroom
activities based on textbook or video. Though Jones was the lead CD-ROM designer, he collaborated actively throughout with Frommer, who has a long history of involvement in CALL-related activities. The structure of book and CD-ROM run in parallel—ten units with three lessons in each unit—and Frommer took responsibility for providing exercise designs for lesson 3 in each unit, which were intended to require students to creatively apply skills acquired in the first two lessons of each unit.

During the video shooting in Besançon, four categories of CD-ROM activities were established: 1) Préparation—to involve vocabulary and pronunciation, for example; 2) Compréhension—text, video or audio-based comprehension exercises; 3) Production—exercises involving writing or voice recording; 4) Expansion—exercises requiring a synthesis of other work or cultural exploration. Note that these four category names are cognates and offer no barrier to students as to their meaning. (see Figure 1.)
Early programming work on the CD-ROM involved creation of templates using token content while video editing and first drafts of the textbook units were being completed. At the same time interface conventions were developed. (see Figure 2)
Eventually twenty templates were created, which allowed for recycling of Lingo code (the Director programming language) from one unit to the next. Here is the actual template list, with selected illustrations:

\[ P = \text{Préparation}; \quad D = \text{Production}; \quad C = \text{Compréhension}; \quad E = \text{Expansion} \]

\textbf{Préparation}

- **Pa – Visual Vocabulary.** Associating sounds, text and images as a holistic method for building vocabulary or factual knowledge base. Bimodal study/test. In study mode, clicking on the image causes sound play with optional transcript display. In test mode, the sound is played and student must click on appropriate image. (see figure 3 for example)
- **Pb – Visual Vocabulary.** As Pa, but study only (no test), with record/ playback.

- **Pc – Pronunciation.** Derived directly from pronunciation explanations in text. Explanations with clickable audio and record/ playback.

**Production**

- **Da - Listen, Record, Repeat** - Mimics traditional cassette recorder functions except that prompts are video, with an alternate audio recording, and transcript is available on demand.

(See figure 4)
Figure 4

- **Db- Dictation** - Computerized version of traditional dictation exercise, using video prompts.

- **Dc- Dictation2** - Computerized version of traditional dictation exercise, using audio prompts (sound XObject playback allows for simultaneous typing).

- **Dd- Dictation3** - Computerized version of traditional dictation exercise, using relatively long single video or audio (visible controller) sequence, with a cloze-style blanks to fill in. Tab between answer fields.

Comprehension
- **Ca - Short Comprehension.** Multiple-choice (check-box) comprehension check with short video prompts (3 per screen, horizontally arranged). Text feedback in Instructions field for right and wrong answers. Auto-playback of video on wrong answers.

- **Cb - Extended Comprehension.** Extends number of multiple-choice answer groupings and correct answers to many per video prompt. Two video windows stacked vertically screen left. Single-click play/ pause, double-click start over control of short video clips. (See figure 5)

```
<table>
<thead>
<tr>
<th>Option 1</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>André connait très bien la France entière.</td>
<td>Il a souffert un chock culturel.</td>
</tr>
<tr>
<td>L’expérience française d’André se limite à Besançon.</td>
<td>Il supposait que les salutations seraient comme en Afrique.</td>
</tr>
<tr>
<td>Il est arrivé en France par avion.</td>
<td>Il a remarqué tout de suite la chaleur des Français.</td>
</tr>
<tr>
<td>Il a eu une mauvaise expérience à Paris.</td>
<td>Il s’est vite adapté.</td>
</tr>
</tbody>
</table>
```

Figure 5

- **Cc - Short answer with graphic/audio/visual prompt.** Essentially a fill-in-the-blank exercise, but with the variety of possible prompts, as indicated above.
• **Cd - Checkbox answers to multiple video prompts.** Student plays a video, then indicates multiple correct answers in checkboxes. Loads new video, finds NEW correct answers in same checkbox series.

Expansion

• **Ea - Information gathering (browse only).** Click on thumbnails to display text/image/video. Contextualized data.

• **Eb - Associative grouping (click to hilite)** - Allows students to make connections between items of information previously learned. Uses visual and video cues. (See Figure 6)

![Image of a video interface with various images and options]

Figure 6. Video mentions leisure activities. Student clicks on images of activities mentioned.
• **Ec - Associative grouping (drag together)** - A variation on the exercise above, except that on-screen grouping is accomplished by clicking on and dragging images to appropriate locations.

• **Ed- Essay answers to thought questions.** Student views relatively long video clip (larger format-transcript or glossary available-clickable field) then goes to pre-assigned question (up/down arrows click through question selections--eventually capacity for teacher additions to question list) and writes in lined field. Saves composition to disk/diskette as text file, or allows printing directly from the CD activity.

• **Ee - Audio segment dialogue building** - Asks students to build on previous work by rebuilding audio dialogue, dragging segments into order. Student can play any segment by clicking on speaker, any top-to-bottom sequence by clicking checkboxes. Check marks indicate incorrectly placed segments. (see figure 7)
• **Ef - Free response dialogue building** - Asks students to build on previous work by responding appropriately to aural prompt. Offers the excitement of hearing student's voice in native-speaker context, once recordings are complete. Student clicks on image, hears prompt; records appropriate response. Repeats for multiple images. Can play all in sequence, save audio recordings.

• **Ef/b - Free dialogue building** - Like Ef, but the student hears answers and must record appropriate questions.

• **Eg - Binary checklist with deductive component** - Asks students to combine checklist identification of utterance contents with a synthetic response. Latter can be checkbox or short answer.

Figure 7
There were numerous occasions, nevertheless, where unique coding was required for an exercise or activity which was very attractive pedagogically, but had no possible base in one of the templates. Figure 8 is one such activity, the creation of which incidentally included the discovery of a flaw in Director’s floating point display after an online discussion with the Director developer community through the direct-l listserv. The exercise involves the student dragging coins onto the waiter’s tray to match the bill that the waiter has announced. The flaw involved a difficulty in specifying an accurate display for currency (i.e., two places past the decimal point) after certain mathematical operations had been effected.

Figure 8
Figure 9 is another example, in which the student must tap out the telephone numbers (s)he hears, being rewarded with "Hello" if the number is correct or "This number is not in service" if incorrect. The student can also click the receiver to hang up and redial.

For each exercise (out of approximately 300) a design document was prepared to track completion of screen design, programming, selection and preparation of media and final assembly. Once the templates were in place the major barrier was the media. Our video was dumped from Hi8 to Beta. Frommer did the video editing for the video cassette component from the Beta versions, after which they were shipped to Jones for additional logging for digitizing.
Digitizing was done by John Antonucci of the Software Engineering Institute at Carnegie Mellon University. Each clip had to be described in such a way that a non-French speaker could easily find it among hours of raw video, digitize it and title it so that its relation to the exercise was transparent and it could be easily integrated into the Director movies. (See Figure 10 for an example of an edit sheet.) Titling was especially critical, given that the number of media files eventually reached almost three thousand. Through careful planning, if all three thousand had been thrown into a single folder, they would have automatically sorted themselves by unit, lesson, exercise type and number, media type and number.

<table>
<thead>
<tr>
<th>Edit No.</th>
<th>File Name (by size)</th>
<th>Transcript (beginning...end)</th>
<th>Character</th>
<th>Tape In</th>
<th>Tape Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 x 150</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>013C1Q01.MOV</td>
<td>&quot;Maintenant...desi-soeurs.&quot;</td>
<td>Renaud</td>
<td>37:00:28</td>
<td>39:25:03</td>
</tr>
<tr>
<td>240 x 180</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>013E1Q01.MOV</td>
<td>&quot;Là, tu vois...mon oncle.&quot;</td>
<td>Anne</td>
<td>4:31:27</td>
<td>4:48:18</td>
</tr>
</tbody>
</table>

Figure 10
Once several units reached an initial completion stage, they were shipped off to co-authors, publisher and reviewers for feedback. In many cases students were asked to comment. Changes which resulted were mostly of the interface type—the need for additional help or a more obvious sequencing, for example. Some exercises were thrown out entirely as being too difficult or uninteresting. Inevitably, bugs were discovered and the iterative process of fixing them and retesting began. This process in fact never ends in a project of this complexity: it eventually just stops. Many of the worst bugs were introduced in the passage from Mac to Windows versions, but revisions were constantly being made to exercise content as well, with the inevitable proofing error in a video transcript showing up after everything was apparently complete.

The overall process took at least six years to finish, for a 1998 publication. During this time media (sound, video, image, illustration) were constantly being created and digitized, even while exercises were in the process of being assembled. Frommer had multiple hats to wear in the textbook and video production process, and sometimes delays in those areas resulted in painful delays for the CD-ROM. During the process, the publisher underwent several re-organizations, meaning that the people we were reporting to changed and had to be brought up to speed before approvals were forthcoming for additional expense. When the method was officially presented at ACTFL in 1997 (which is the customary preview for 1998 releases), the authoring team was equal parts pleased and exhausted.

Conclusions
Whenever a project becomes as large as this one, the pressures and tensions and frustrations increase exponentially, as does the potential for reward and satisfaction. Though the book and
CD-ROM have sold well and been favorably reviewed, it is unlikely that any of the authors will ever be realistically compensated for the time and effort that the project required, other than the increased professional standing which accompanies the successful completion of such a project. There is, however, little question that some or all of us will do it again. The mobilization of resources that is possible with the support of a large publishing house allows one to strive for a level of excellence that would be impossible on one's own.

As to the prospects of the multimedia stand-alone CD-ROM, it's future is less certain. Everyone from Macromedia to Microsoft is now declaring themselves to be Internet (read: web) companies, while the DVD has introduced a variable to removable disc-based multimedia that includes uncertainty, potential and a new splintering of the market.

Change is the one constant in technology-related activities, and computer-assisted language learning cannot escape this reality. Those who wish to participate must be willing to be life-long learners, have an enormous capacity for work, and enjoy the endless problem solving which the process involves. It is ultimately an attachment to a certain area of learning that keeps CALL practitioners going, however. Abandoning language and culture would allow the use of similar skills in game or entertainment production, where both compensation and competition are exponentially greater. It is unlikely that many of us will make that leap, and it is useful to keep always in mind that content should drive the courseware development process. Of course content and pedagogy are as dynamic as technology, but that's a discussion for another time.