PART IV

Pedagogical Approaches to Revitalization and Maintenance
12
Digital Transmission of Language and Culture: Rethinking Pedagogical Models for E-Learning
D. Victoria Rau and Meng-Chien Yang

12.1 Introduction

The technology of e-learning has dramatically changed the genre of the language textbook, the context of language teaching and learning, and the traditional roles of language teachers and learners. The key benefits of e-learning, such as the ability to meet individual learning needs, access a wider range of resources, and be exposed to multimedia materials, including both images and sounds, are particularly useful for the design of teaching materials for less commonly taught languages and/or endangered languages, since such textbooks are not readily available and are extremely costly to produce. However, little research has been conducted to explore the pedagogy of using information and communication technology (ICT) in the promotion of minority language teaching and research.

Some efforts have been made to develop web-based interactive language learning materials for the two major Austronesian languages, Indonesian and Tagalog, which have also been the best documented languages in Austronesian linguistics. Henry and Zerwekh (2002) describe the SEAsite (www.seasite.niu.edu), featuring well-developed materials for both beginning and intermediate students of Indonesian and Tagalog, and for mainland southeast Asian languages, such as Thai and Vietnamese. Their language materials consist of text, audio, pictures, on-line dictionaries and interactive exercises and quizzes. Their interactive exercise types focus primarily on receptive skills of reading and listening comprehension, vocabulary acquisition, and

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grammatical sentence construction. Their on-line dictionaries are organized by root form, thereby posing potential difficulties for beginning students, who may have trouble searching for words. In addition to extensive information in both second language (L2) and English on the culture, art, history, politics, and religion of their respective countries, the Tagalog site also has a chat room and a popular discussion forum that their Tagalog staff regularly monitor and provide answers to the questions posted.

Software for teaching the two well-documented Austronesian languages has also been produced, such as Hoven’s (2003) MMInteraktif, an Indonesian listening comprehension software package, and McFarland’s (2006) CAI program for teaching Filipino. Hoven (1997) provided a detailed discussion on pedagogy. Her package was designed on the basis of sociocultural methodology (Vygotsky 1978) to introduce, develop, and reinforce appropriate learning strategies at the same time.

The interaction between Computer Assisted Language Learning (CALL) and endangered languages has been an under-researched field. Ward and Genabith (2003) identified special constraints that determine the endangered language’s CALL requirements. Although the constraints tend to be culturally specific and may vary from case to case, some of the requirements they proposed point to the need for considering language documentation issues in developing CALL in the context of endangered languages. They further suggested that CALL materials be integrated with, or contribute to, language documentation efforts in an endangered language community. Ward and van Genabith also showcased a working example of Nawat courseware, developed using their software template for this endangered Uto-Aztecan language of El Salvador.

In the process of digital archiving Yami, an endangered Austronesian language, Yang and Rau (2005) also integrated CALL materials with language documentation. Rau, Yang and Dong (2007) provided a historical account of Yami language teaching, from a grammatical syllabus (Dong and Rau 2000b) to a communicative syllabus using a multimedia CD as a resource (Rau et al. 2005), to the development of interactive online learning based on the digital archiving project. We discussed the methods used and challenges of each stage of preparing Yami teaching materials, and proposed rethinking pedagogical models for e-learning, the gap addressed by this current chapter.

This chapter aims to provide a pedagogical e-learning model to meet the challenge of developing e-learning materials for the Yami language, based on digitally archiving Yami language documentation for the purpose of preserving the endangered language. The process of building a platform for the e-learning materials needs to be informed by an in-depth investigation of the contexts of language teaching and learning, so that the design of information and communication technology materials can meet the learners’ needs.

This chapter begins with background information on the Yami language and its vitality, followed by the purposes and outcomes of developing e-learning materials for Yami, and culminates in a proposed model which takes into consideration the special needs for e-learning development for endangered languages.
12.1.1 Yami language and its vitality

Yami is a Philippine language, spoken by the indigenous people on Orchid Island (Lanyu in Chinese), a small offshore island southeast of Taiwan and at the northern tip of the Batanes Province of the Philippines. Politically, the island is under the administration of Taiwan.

Yami constitute 93 per cent of the 3007 residents on the island (Rau 1995). Almost half of the population is either above 50 or below 20 years old. Young adults usually seek employment in Taiwan. According to Rau’s (1995) sociolinguistic survey, there was only one village out of six on the island where children still used some Yami in daily interaction. Yami has been offered as an elective in elementary school since 1998, but Yami is gradually being replaced by Mandarin Chinese. Chen (1998) has compared the language proficiency, language use and language attitude among three generations of Yami and found a language shift to Mandarin and a decline of Yami language ability as age decreases. Lin (2007) re-examined language use and language ability among Yami teenagers and found that while Yami is still spoken in Iraralay, the other five villages show continuing decline in the use of Yami by teenagers with their parents. However, Yami teenagers were found to have a positive attitude towards Yami language and identity and strongly support any efforts to promote or maintain their language. Be that as it may, most of the teenagers admitted that they prefer speaking Mandarin over Yami.

12.1.2 Rationale for developing e-learning for endangered language documentation

Yami language documentation had been carried out in the framework of ‘traditional fieldwork’ for ten years before it embarked on the new phase of ‘documentary fieldwork’ in 2005. Rehg (2007) characterized ‘traditional fieldwork’ as generalization-oriented with a goal of linguistic description of a specific language, whereas ‘documentary linguistics’, following Himmelmann (2006: 1), is data-oriented with a goal of creating a lasting, multipurpose record of a language. At the beginning of the phase of documentary fieldwork, Yang and Rau (2005) proposed a conceptual framework that connects three different tasks related to language documentation: language archiving, language processing and creating e-learning materials. It addresses the needs of a field linguist who has collected some endangered language materials from an indigenous community and intends to establish a shareable language resource via the internet.

Three principles were followed in preparing the four-volume multimedia materials in Yami (Rau et al. 2005): (1) selecting interesting topics covering a wide range of genres and structures, (2) adopting a communicative task-based approach closely tied with standards and assessment, and (3) using ICT (information and communication technology) to enrich the contents and modes of presentation. The topics and sequence of grammatical structures followed the standards implemented by the
D. Victoria Rau and Meng-Chien Yang

Ministry of Education (MOE) in Taiwan closely. The first two volumes comprise constructed dialogues based on a story line of a Chinese student touring Orchid Island. The main character flies back to Taiwan at the end of Volume Two. The third volume includes many dialogues constructed based on the folklore and narratives Rau and Dong collected previously (2006). Volume four is a collection of short stories and descriptions of cultural activities ranging from traditional to contemporary events.

During the process of building a platform for the e-learning materials, Rau, Yang and Dong (2007) quickly discovered that it would not be sufficient to simply make the four volumes of prepared language materials available on the Internet without making drastic modifications to the format. What are the benefits and constraints of e-learning? What online support is required?

To address those questions, we decided to target Chinese graduate students in Taiwan who were interested in learning an indigenous language. In the process of building the e-learning program, C. Yang (2007) conducted a formative assessment of those students’ needs, which shaped modification of the program, such as adding online learning games, pronunciation drills, and self-assessment (http://yamiproject.cs.pu.edu.tw/elearn/learning.php). After the program had been established, we began to explore how well it met the needs of Yami youths on Orchid Island and its applicability to other indigenous language communities.

12.1.3 Feedback on Yami e-learning from indigenous communities

The Yami e-learning program (http://yamiproject.cs.pu.edu.tw/elearn) has received positive feedback from indigenous language teachers in Taiwan and has the potential to become a model for building e-learning programs for other languages. According to Rau and Yang’s survey (2007: 122–3), the indigenous language teachers showed most interest in using the (1) online dictionary, (2) online audio or video clips on daily conversations and indigenous knowledge, and (3) online animation in developing their own course materials.

The Yami teenagers’ attitude towards e-learning, on the other hand, is mostly pragmatic. The only impetus for them to use the e-learning materials currently is for test preparation of ‘certification of indigenous languages’ to enter better schools (cf. Huang 2007).

Although we recognize the importance of bottom-up strategies in language revitalization, we are proposing a status building strategy by increasing visibility of the endangered language and culture nationally and internationally. We believe providing high-quality materials online translated into English and Chinese, incorporating the e-learning program into the graduate curriculum of Austronesian linguistics, and teaching the language to Chinese learners at the college level will eventually add status to the language and hence will increase the motivation for Yami parents to transmit the language to their children.
12.2 Proposed Model for Development of E-Learning and Pedagogy

In the following paragraphs, the discussion focuses on the status building strategy. We first describe our mediated action derived from three central tasks in the development of our e-learning website, following Scollon and Scollon’s (2004) guidelines of ethnographic nexus analysis. Finally, we propose Conole et al.’s Model (2004) as a basis for developing our e-learning pedagogy and summarize our strategy by which community materials can be developed.

12.2.1 Context

The Yami language has been used as an exemplar language in the graduate seminar on Austronesian Linguistics at Providence University since 1999. The first attempt by Rau to teach Yami structure to three MA students in linguistics culminated in the publication of the Yami Textbook (Dong and Rau 2000b), in collaboration with Dong, a Yami native speaker with training in ethnology. The continuing effort in description and documentation of Yami has gone hand in hand with language teaching since then. The four-volume coursebook with CD (Rau et al. 2005), as mentioned previously, was produced and field tested with seven college students at Dong Hua University, when Dong was invited to teach a required four-semester course on the Yami language in the Department of Indigenous Languages and Communication during 2003–2005.

In the spring of 2005, Dong and Rau co-taught Yami to five graduate students at Providence one hour per week as part of the Austronesian Linguistics seminar, using the first two volumes of the multimedia materials as the coursebook. Dong was responsible for providing Yami language input by modelling pronunciation and supplying vocabulary and sentences to mediate communication in Yami, a modified Community Language Learning approach (CLL, Curran 1976). Rau, on the other hand, played the role of a linguist, explaining grammatical structures in L1. The goal of this course was to familiarize graduate students in linguistics with the Yami structure.

The development of e-learning materials began in Fall 2005, with a grant provided by the Hans Rausing Endangered Languages Project (HRELP) to the authors for digital archiving Yami texts in Rau and Dong (2006), and other materials collected for this project. The four-volume coursebook with CD (Rau et al. 2005) provides the scaffolding for further development. Yang played a key role as the e-learning developer, training computer technicians and graduate students to use the programs, while Rau was the content provider and researcher, participating in the process of transforming the teaching materials from print and CD versions to an online interactive version.

The e-learning materials were first field tested in Rau’s graduate seminar, ‘Austronesian Linguistics: Yami structure, function, and teaching’ in Spring 2006. Dong and Rau co-taught Yami to seven graduate students at Providence one hour per week as part of the Austronesian Linguistics seminar, using the first volume of the multimedia materials as the coursebook. Among this group of graduate students, three of
them had previously taken a course in English CALL, three others were interested in Austronesian linguistics, and one linguistics student who had taken the same seminar before was recruited to help with action research on the course. The same course was repeated in Spring 2007, the results were reported in Rau et al. (2007). All the participants in developing the e-learning materials are represented in Figure 12.1.

12.2.2 Participants

The targeted learners are university students, focusing primarily on graduate students in applied linguistics at Providence University with the potential to be extended to the community members who are two or more generations removed.

The community members were brought into the picture through two initiatives. First, Rau and Dong obtained a letter of permission from a community representative to express their interest in participating in the HRELP-funded project and invited two members to provide video clips for the research. Second, the authors held a workshop on Yami Revitalization in the community eight months after initiation of the project to facilitate continued partnership of the community members with the research team. During the workshop, several local language/culture activists were invited to present their strategies for language revitalization, in addition to our team members’ progress report on our documentation project and development of the Yami e-learning program.

The university researchers are primarily content providers and e-learning developers, with the potential goal of becoming learners. The three major figures in the project are (1) Rau, an applied linguist who did extensive research on Yami, (2) Dong, a native Yami who had knowledge and experience in linguistic analysis and Yami
language teaching, and (3) Yang, a computer scientist with an expertise in digital archiving and e-learning.

As shown in Figure 12.1, each participant serves at least two roles in the process. While the middle-aged and older generations of community members provide content, the university students in applied linguistics and computer sciences help develop interactive activities. The role of the traditional language teacher is embedded in the university researchers and community members in this project, whereas the students served double roles as learners and e-learning developers. Thus, as predicted by Hanson-Smith (1997), language teachers, in addition to performing the same functions they do now—lesson planning, individual counselling, preparation and selection of materials, evaluation of process and product, etc.—have relinquished some of their power and authority, not to the computer, but to the students themselves in the use of technology. In fact, the graduate students learning Yami were empowered as they were invited to contribute e-learning activities to the project, as discussed in the following section. Additionally, the core team members were also empowered as they were committed to collaboration in an interdisciplinary manner for many years.

12.2.3 Significant cycles of discourse

The two most important cycles of discourse in the process of developing the e-learning website include weekly classroom interactions and developer meetings.

12.2.3.1 CLASSROOM INTERACTIONS The Yami class was part of the Austronesian Linguistics Seminar, which met weekly during the third period for fifty minutes after two periods of discussion on selected journal articles on Austronesian linguistics. Rau, the instructor of the course, invited Dong to provide Yami native speaking input in the classroom setting. When the class began on February 2006, there were seven graduate students taking this course. In the middle of May, one ELT student dropped out for personal reasons; however, she indicated the most enjoyable part of the course, the one that she would miss the most, was learning Yami. The three remaining ELT students expressed their interest in investigating Yami e-learning as their goal of taking this course, whereas the three linguistics students were attracted to this course for various reasons including the instructor’s expertise in Austronesian linguistics.

The classroom was designed for graduate seminars with students seated around the table with a clear separation between the linguistics and ELT disciplines. The two instructors (Rau and Dong) were seated at the side where the white board and the screen for the computer projector were placed. Each Yami session was videotaped by a linguistics graduate student, who served both as an auditor of the course and a research assistant. The place that was foregrounded or backgrounded changed depending on which dyad was role playing. The camera followed the action around the classroom. However, the white board was the default foreground as it was used heavily to provide visual cues for grammatical explanations.
The discourses that were most central to the development of e-learning materials were the language learning activities, originally written for the four-volume multimedia materials (Rau et al. 2005) and revised to meet the needs and fit the time frame (fifty minutes) of the classroom instruction. The learning activities were available from the WebCT for the students to download before the class meetings. They were expected to use the sound files on the web (http://yamiproject.cs.pu.edu.tw/elearn) or the printouts from the Microsoft word files of the coursebook to preview the lessons.

During each session, the students were first asked to role play in mini-dialogues after repeating the examples read by the Yami instructor. Grammar explanations in Chinese followed the introduction of Yami sentences, although the classroom interactions featured communicative functions of language.

The students’ homework assignment, sent to the two instructors by email for comments and corrections, was also backgrounded, although some students’ productions would be selected to showcase students’ performance (e.g. songs) on the website. Towards the end of the semester, the students’ homework included identifying Yami verb affixes and case markers for nouns. Each student was also assigned to create an interactive online activity as an assessment based on the lessons they had learned. The instructors provided an example of a jeopardy game and encouraged the students to use software, such as Hot potatoes (http://web.uvic.ca/hrd/halfbaked), Quia (http://www.quia.com/web/index.html), or Macromedia flashcards (http://www.macromedia.com), to develop their own activities for assessment. The students’ contribution to the online activities turned out to be an empowering experience, as expressed in a focus group discussion with the authors.

The e-mail correspondences between Rau and Dong between classes played an important role in the process because the ‘invisible’ discourse actually directed the contents of the classroom activities. The activities were ‘fleshed out’ before the class met each week. After being tested in the classroom setting, they were revised for the computer technicians to upload on the website.

The video camera, placed at the opposite end of the room from the two instructors, was a mediational means of directing our classroom discourse. The purpose of videotaping the classroom interactions was to collect video footage of live interactions between the instructors and learners. The action of videotaping for the class was based on the need to produce multimedia e-learning materials, which can be further traced to concepts and principles in e-learning. A blending theory, proposed by Rossett et al. (2003), served as a mediational means for our action. A blend is an integrated strategy for delivering on promises about learning and performance. Possibilities of blended learning include: (1) formal vs. informal, (2) technology-based vs. people-based, (3) independent vs. convivial (social), and (4) directive-oriented vs. discovery-oriented.

The Yami classroom interactions tended to feature the formal (instructor-led), technology-based, convivial, and directive-oriented ends of the learning. Videotaping of the classroom interactions was necessary to add these items crucial for
Pedagogical Models for E-Learning

self-paced learning, with the goal of developing a complete online e-learning course in Yami that does not require the presence of instructors.

In summary, we have seen how the classroom interactions served as a significant cycle of discourse in the development of Yami e-learning. The life histories of people, places, discourses, and objects all interact, leading towards directional change and transformation as discussed in the following paragraphs.

12.2.3.2 DEVELOPER MEETINGS

The other crucial cycle of discourse was the weekly developer meetings. The research team began meetings on a regular basis when the project began in August 2005. Rau, as the primary investigator (PI), recruited two people to join the project: a linguistics graduate student who indicated interest in writing his MA thesis on Yami and another assistant who had extensive experience working on previous Yami research projects. Both had sufficient computer skills to carry out the tasks required for the project. Yang, as the co-PI, recruited a computer science graduate student to write computer programs as his thesis topic and three other computer technicians to work on the two websites for this project. The website for the digital archive (http://yamiproject.cs.pu.edu.tw/yami) records all the activities for this project.

The team met weekly in a large administrative meeting room with a U-shaped table in the College of Foreign Languages and Literature where the PI was housed, but six months later, we moved to a graduate seminar room in the same building with a computer connected to the internet. As the room was equipped with internet access, it helped focus the team members’ attention on the development and maintenance of our websites.

The PI and co-PI presided at the meeting. We were seated next to each other at the side where the white board and the screen for the computer projector were located. At the beginning of the semester, the PI primarily relied on the co-PI to provide training and guidance for the team and delegate responsibilities for the computer technicians to carry out their work. After six months, the PI began to exert more leadership and decided to implement two activities which brought changes to the relationship of the team.

First, the PI invited the co-PI and one computer technician to co-teach a course on ‘Technology and Second Language Learning’ to a group of in-service English teachers for the Continuing Education Program at Providence, in response to an urgent call for help from that program. The major sources of teaching materials were based on the CARLA website (http://www.carla.umn.edu/technology/institute). This teaching experience provided opportunities for the three of us to integrate our expertise in e-learning and second language acquisition. The PI learned about the co-PI’s concepts of e-learning and learned from the computer technician how to use several software packages to create online lessons. This inspired the PI to develop the Jeopardy game for a Yami lesson as an online assessment activity. During the process of teaching, two guidelines gained prominence in directing changes in the design of our e-learning

The other initiative provided a link with the community members. After eight months of research, the authors decided to hold a workshop on Revitalizing Yami on Orchid Island to provide a forum for dialogue between the community members and the team. The goal of this workshop was twofold. The first and foremost objective was to gain some consensus on orthography issues, especially the spelling of /r/ and /z/ to refer to retroflex and trill respectively. The other goal was to update the local people on our project to gain support from the community. Among all the talks presented in the workshop, the e-learning component of the project was most warmly received, with high expectations. This led to a further plan from the co-PI to incorporate animation into each lesson, as discussed in the following section.

In summary, the developer meetings served as the second significant discourse cycle that shaped the direction of our actions.

12.2.4 Changes

In this section, we describe what actions we took as participant-analysts in this nexus of practice that transformed discourses into actions and actions into new discourses and practices. The two key points to be discussed are the collaborative teaching experiences and the workshop on Orchid Island.

The collaborative teaching experience was a turning point for the two actions of the PI. The discourses in the two cycles changed her belief about whether e-learning could displace and eventually replace classroom instruction in Yami, transforming her thinking on pedagogy from the more people-based to the more technology-based end of the curriculum spectrum. This also reinforced Dong’s decision to propose e-learning as an alternative to her teaching at Dong Hua University as long-distance travel to the east coast posed increasing obstacles. Her action led to the PI and co-PI’s further decision to accelerate the process of developing the e-learning materials during the summer vacation to meet the immediate needs of e-learning in Fall 2006.

The e-learning program was finally completed and integrated into the Austronesian Seminar at Providence University in Spring 2007. The hours for teaching Yami in a classroom setting actually increased from one to two hours per week, while the online materials played a supplementary role. Meanwhile, grammar explanation was reduced to minimum with most of the classroom activities focusing on communication. As a result, the native speaker teacher was foregrounded and the linguist was backgrounded.

The workshop on Yami language revitalization in April 2006 on Orchid Island was another key point in the cycle because it led to two major actions taken by the co-PI. First was his attempt to design the e-learning model based on his interviews with the instructors and the learners, as presented in Rau and Yang (2007: 118–19). Second, the co-PI organized a group of undergraduate computer science majors to work on
an animation project for the e-learning, as a result of the desire expressed by the community members.

The nexus of actions led to the second move by the PI to test the acquisition order of Yami phonology and syntax in a longitudinal study, reported in Rau et al. (2007), a natural follow-up to test whether the e-learning material sequencing matches the order of second language acquisition.

In summary, this discourse analysis has enhanced our understanding of the mediated actions and paved the way for comprehending why a certain pedagogical model was developed, as described in the following section, to reflect the changes brought about by actions of all parties involved.

12.3 E-Learning Pedagogy and Design

In what follows, we give a comprehensive and detailed description of (1) the pedagogies of the e-learning, (2) the planning and design process of the e-learning development (3) the process of aggregating the contents for building the e-learning platform and (4) the process of establishing the proper online interactions.

12.3.1 E-learning pedagogy

To create the proper e-learning courses for the Yami language, we propose a mixed model adopted from a study by Conole et al. (2004). In this model, the process of learning is categorized as a framework with six components: Individual, Social, Reflection, Non-reflection, Information, and Experience. Compared to traditional learning theories, Conole’s six-component learning model was developed specifically for e-learning practitioners to design e-learning programs more easily to map to the pedagogical contents. These six components represent the learners, learning process, learning activities, methodologies and self-reflection of the learners.

Our proposed model is similar to the above-mentioned model in that it also has six components. However, the learners’ reflection and non-reflection are replaced with cultural practice and documenting and annotating to better represent the context of Yami language teaching and learning. The six components are shown in Figure 12.2:

1. Individual: The learners are the focus of the whole learning process.
2. Information: The whole documented materials related to the Yami language, including texts, recordings, video etc., provide the sources of information.
3. Cultural Practice: The learning is linked to unique Yami cultural items.
4. Social: As the learning process involves interactions with tutors and peers, the learning process can be described as collaborating or mutually beneficial activities.
(5) Experience: The learners’ on-site experience will enhance their learning strategies and increase their Yami language proficiency.

(6) Documenting and annotating: The learning is integrated into the process of documenting and annotating the Yami language.

The advantage of Conole’s model is that the e-learning developers can easily identify the pathways between two components and can develop a step-by-step approach to craft the e-learning program to fit pedagogical requirements. Our proposed design adopted the structural framework of Conole’s work but foregrounded the importance of documentation for endangered languages. This is consistent with Himmelmann’s (1998, 2002, 2006) proposal to conceive of language documentation as an independent field of linguistics, many other scholars’ concern about incorporating digital archives into documentary linguistics (e.g. Woodbury 2003) and suggestions about how to use modern technology to handle data and build a corpus (e.g. Austin 2006, Johnson 2004).

The two components of reflection and non-reflection in Conole’s model are included in the component of experience in our proposed model. Therefore, we adjusted the components to include these parts. The proposed model takes into consideration the special needs for e-learning development for endangered languages. This model can be used in the development of e-learning programs for other endangered languages.

In Figure 12.2, the representation of the proposed model illustrates the basic concepts necessary to both learn and preserve an endangered language.
As we were conducting the digital archiving and documentation project for the Yami language, we found that many parts necessary for transforming the materials from people-based to technology-based were missing. Hence, the traditional pedagogical models for second language teaching cannot be grafted together without changes when designing and conducting e-learning courses for the Yami language.

In addition, the e-learning plan for the endangered language should be considered as a plan for the school for all community described in Young (2002). In his study, the school for all community is described as the innovative web learning environment that is used as the virtual community for teachers and learners to study and learn via internet. In designing the e-learning environment for the Yami language, we aimed to build an environment for all different learners following this concept.

The proposed model was used to map the Yami language learning pedagogy and different evaluation tools for constructing the e-learning materials for the Yami language. In documenting and archiving the Yami language, we were also building an e-learning platform simultaneously. We illustrate the process of developing the Yami project as an example to validate our model as follows.

12.3.2 Planning for e-learning

In this section, we describe the preparation and design of the e-learning program for the Yami language using this model. The e-learning site for the Yami language includes several different online programs for different groups of learners. These groups include community members, university students, and researchers. For the Yami language, we consider the e-learning program as an approach to preserve this language. Therefore, the planning for the e-learning program includes the following steps:

1. Collection of learning materials for the Yami language: materials are being continuously collected and archived to supplement the four volumes of the Yami language multimedia learning materials (Rau et al. 2005).

2. Design of learning activities: the learning activities include different kinds of classroom activities and self-assessment.

3. Production of online materials: these learning materials and learning activities are transformed into online digitalized contents.

Suppose that we plan to design an e-learning course for a particular group of learners, the steps for developing the e-learning course are as follows:

1. Analyse the learning goal of the learners and describe the characteristics of the learning activities.

2. Use the proposed model to highlight key components of the learning activities and map these highlighted components to a pedagogical template.
(3) Use this pedagogical template to organize the learning materials and learning activities. The outcome of this step is a set of e-learning courses.

(4) Refine the contextual links of these e-learning courses and provide specific information to these courses.

Ward and Genabith (2003) suggest that CALL courseware developed specifically for a given language will be better than courseware developed following general principles (e.g. Auld 2002). Thus we illustrate not only the final product, but more importantly the planning steps for developing the e-learning materials for Yami at Providence University. The characteristics and highlighted components in the model are shown in Figure 12.3. The mapped pedagogical template is shown in Figure 12.4.

Figure 12.3 and Figure 12.4 show how to apply our proposed e-learning model to the design and teaching of a graduate-level Yami language course. An analysis of the goals and materials of this course leads to a summary of the characteristics of this course (Figure 12.3). Three components of the basic model are present in the course: individual, information and social. Based on these components, the learning process is designed as the template including four steps: online materials, panel discussion, class collaborative activities and instructional recitation (Figure 12.4). Each process is mapped to a specific e-learning process developed with proper ICT technology. The online materials are mapped to the presentation of the course materials. The panel
### Pedagogical Models for E-Learning

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<tr>
<th>Pedagogical Template</th>
<th>e-learning Mapping</th>
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<tbody>
<tr>
<td>Online Material</td>
<td>Online materials are presented as course-based interactive Yami language learning materials</td>
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<td>Panel Discussion</td>
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<td>Class Collaborative Activities</td>
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<td>Instructional Recitation</td>
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<td>Redo Online Learning Game 1</td>
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<td>Instructional recitation includes video clips and audio sound tracks of the related course</td>
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**Figure 12.4** The pedagogical template
D. Victoria Rau and Meng-Chien Yang

discussion is mapped to the setting of an online discussion. The class collaborative activities are mapped to the process of selecting an effective collaborative learning game. Finally, the instructional review is mapped to online learning materials such as Yami language video and audio clips which are useful for the learners to review the course materials.

12.3.3 E-learning implementation.

We have developed the first version of the multimedia e-learning platform for the Yami language based on the following guidelines:

(1) The e-learning system provides an interface simple enough for the beginner;

(2) The e-learning system includes different levels of the course materials with the possibility of adding new materials,

(3) The e-learning system provides many visual effects to stimulate interest in learning the Yami language,

(4) The e-learning system provides a comprehensive dictionary and an effective searching tool.

The e-learning system is developed as a group of dynamic web pages which are stored in a web page server with a database engine for manipulating the course materials and the learning records.

The current e-learning platform for the Yami language includes the following components:

(1) The Yami course materials, classified into three levels: beginner, intermediate and advanced. In each lesson, the materials include the Yami text, sound tracks, Chinese and English translation, word analysis, grammar, learning activities, and exercises,

(2) The Yami dictionary, organized in alphabetic order,

(3) The system setting tool which includes the interface setting, the learning log setting, and the web display setting,

(4) The online learning activities which students can use to practice on their own,

(5) The virtual learning group which allows the students to email their learning logs to their own mailbox and the teacher’s mailbox.

12.3.4 Establishing the proper interactions

After the Yami e-learning courses were put online, the next task was to ensure that the materials could perform successfully for online teaching. That is, users can interact properly with the e-learning system. The process of developing proper interactions was long and repetitive. The outlook and style of the Yami e-learning platform have been changed several times to make the Yami e-learning easy and straightforward.
Since the ultimate, targeted users of the Yami e-learning platform are Yami youths and community members who have very limited computer skills, we made an effort to ensure that these users would operate in a ‘safe exploration’ environment when they use the e-learning materials. Based on this consideration, the Yami e-learning platform is designed with the following guidelines:

1. The menu and functional buttons are clearly displayed,
2. The entry point of each lesson is clearly identified,
3. The sound of each sentence can be played by pushing the button placed at the beginning of the sentence,
4. The dictionary can be searched in a simple and easy format,
5. Exercises and quizzes can be found in each lesson.

We believe that proper interactions will lead to effective e-learning using the materials. In addition, the above-mentioned guidelines are designed to make the interface simple and easy-to-use when one is developing e-learning materials for minority languages.

### 12.4 Proposed Model for Development of Community Materials

Finally, we propose a collaborative model for developing community materials based on our experience in language documentation and establishing the e-Learning program for Yami. In essence, we argue for community materials to be developed based on a long-term collaboration between community activists, linguists, and IT professionals. In light of the Yami case, the process of developing community materials does not necessarily need to follow a linear order of: documentation > grammatical analysis > writing textbook > development of course materials > building e-learning materials. Rather, it can start from any component and build on each other simultaneously and cyclically when the opportunity arises over a long period of time.

Tracing back the history of our collaboration, it all began with Dong inviting Rau to study her language after they met at a conference on Aboriginal languages in Taiwan in 1994. Dong’s initial plan was to publish a Yami dictionary, whereas Rau was more interested in developing teaching materials for college students. After conducting a sociolinguistic survey on Orchid Island (Rau 1995), they decided to work on a college level Yami language textbook (Dong and Rau 2000b), built from constructed dialogues and texts. Meanwhile, more texts were collected (Dong and Rau 1999, 2000a), grammatical analysis was carried out (Rau 2002, 2005; Rau and Dong 2005), and the four-volume course materials (Rau et al. 2005) were developed and tested on college students at different institutions. Their work was not acknowledged as valuable by the community until their book *Yami texts with reference grammar and dictionary* was finally published (Rau and Dong 2006) and delivered to the community.

In addition to the publication of their major book, the other turning point of their relationship with the community was the addition of Yang’s computer expertise to the language documentation project in 2005. The community members’ high expectation
of what IT technology could contribute to a language project has increased their
motivation to collaborate with the Providence team.

In addition, the development of the team could be another important factor in-
uencing the final outcome. The Yami case began with transmission of Yami language
and culture to college students, using a status building strategy of language planning.
In the process of learning to package and present the materials to graduate and
undergraduate students, the relationship between the linguist and the indigenous
language expert has always been of equal partnership. Although the interactions with
the learners were frequent, community involvement had been somewhat limited until
computational expertise was brought into the project and transformed the group
dynamics from a ‘lone wolf’ approach to an interdisciplinary team. In other words,
the formation of the team does not necessarily follow the order of: primary researcher
(linguist) + community > involvement of Indigenous language expert > need for
computational expertise > need for test group (the graduate students). Instead, the
graduate students played an important role in the initial development of the commu-
nity materials, whereas the community was the last to respond positively to the project
and to express willingness to be involved.

12.5 Conclusion

Following the nexus analysis, we described the process of developing the e-learning
program for Yami to preserve the endangered language. Several actions we took as
participant-analysts were identified in this nexus of practice that transformed dis-
courses into actions and actions into new discourses and practices. Based on our
analysis of the historical body of the persons, places and significant cycles of discourse,
we developed a pedagogical model that integrates digital archiving with e-learning.

In this model, the contents and learning activities of the Yami language were
described as six components arranged as the endpoints of a hexagon. Documentation
of language and culture is included as a unique component in e-learning design for
endangered languages. Using this model, the design and implementation of the e-
learning program for the Yami language could easily be validated.

The development of community materials in the Yami case demonstrates a status
building strategy, beginning from graduate students as the targeted learners and
working back to the community youths when they are ready. It also illustrates a
collaborative approach involving long term commitment to the language community
and bringing in key players and IT technology at the right time.