Chapter I

INTRODUCTION

1.1 Introduction

Advancement in technology and computer has brought about changes in language educational settings. For teaching, it assists the instructors in more easily designing various and attractive teaching aids and provides boundless internet resources for consultation. For learning, software or websites enable students to learn or contact the target language at any time and in any place. As a consequence, everyone in the 21st century is eager to grasp the trend of CALL (computer assisted language learning) or CASLA (computer application in second language acquisition). However, the development of e-learning does not benefit all in the language learning world. The non-mainstream languages continually received far less opportunities to own excellent CALL technology than mainstream languages. For endangered languages, e-learning is deeply meaningful to them. Computer may be one of the solutions to save endangered languages. For example, computers can construct data bases to store certain scarce and valuable corpus. The internet is also significant in making teaching materials available all the time. Also teachers can design interesting learning websites to motivate more learners, native and nonnative speakers, to learn them.

While technology and the internet are rapidly developing, we have to pay attention to questions such as, "Can we ensure the quality of internet resources and software packages?" and "How do we evaluate the effectiveness of software and internet sources?" The questions point out that we should not only create a CALL tool but also one that could really assist in language learning. Gao indicated seven

restrictions of CALL in his speech of "The present and future in computer assisting language teaching and learning": (1) lack of adaptive function, (2) robotic drills, (3) the on-line version of paper or book, (4) insufficient feedback, (5) unclear learning process and effects, (6) inclining multimedia but ignoring the nature of learning, and (7) diverse distribution of the resources. This is the critical moment for language educators and designers to not only create e-learning tools, but also to evaluate the effectiveness and quality of these tools at the same time.

The Context of Yami LanguageLlearning

The target language in the study was one of the endangered languages in Taiwan, the Yami language. Yami belongs to Austronesian languages and is spoken on Orchid Island (Lanyu) which is 60 kilometers off the eastern coast of Taiwan in the Pacific Ocean. According to Professor Rau's studies conducted in 1995 and 2005, Yami has been gradually diminishing since Mandarin Chinese began to be spoken on the Island in 1945. There are six villages: Imowrod, Iratay, Yayo, Iraralay, Iranomilek, and Ivalino. Only the people in the Iraralay and Iranomilek villages, which lie further away from the government offices and airport, have been better able to preserve the Yami language. Furthermore, only the Iraralay used Yami in daily conversation. Other villages tend to speak both Chinese and Yami or only Chinese. Yami is step by step being replaced by Chinese in the process. Chen (1998) investigated the sociolinguistic situation of Yami. The result showed that Yami was declining in the under twenty year old demographic. The study also discussed language use and attitude and found that the younger generation preferred Chinese than Yami. Lin's study (2007) found only the young people of the Iraralay village maintained the habit of speaking Yami in their daily life. However, the younger residents from other villages showed regressive language proficiency that was worse than in the previous studies.

1.2 Statement of theProblem

Following the trend of CALL, some professional journals, like CALICO, Language Learning & Technology, and other CALL related journals that collect various studies about E-learning in language education tend to exclude studies of minority languages. However, most of them focus on learning English as a second or foreign language or on other "major" languages, such as Spanish, French, Japanese, etc. There is little e-learning material available for less commonly taught languages (ICTLs) and endangered languages (ELs). The study of Zhao (2003) collected the existing CALL literatures from 1997 to 2001. The results indicated French and Spanish as foreign or second language learning were the most studied. Other more commonly studied works included English as a second language (ESL), German, and Arabic. The implication of the study recommended that CALL research should be limited to common foreign languages. It is time to endow less commonly taught languages and endangered language learners with same capabilities to possess e-learning materials as those who learn major language through various technological resources. Consequently, this study endeavors to develop a language learning website for an endangered language, Yami, through investigating learners' needs from using experiences using the site.

1.3 The Purpose of the Study

The study was closely related to the project "Yami language learning center." Professor Rau and Dong designed Yami teaching materials and put them on the website. Then the students used the website to assist their learning. Since the Yami language center is an ongoing project and recently established, it was difficult to avoid encountering some problems. From users' real operation of navigating from the technology tool, they would discover some problems that caused their learning to not

be very effective. From these problems, they discovered their needs and recommendations for the website. Therefore, the study contained several aspects. First, it tried to evaluate the website of Yami language center through investigation of students' perceptions. Secondly, their opinions could be used to ascertain as learning needs and provide consultation in developing the site. Thirdly, the research hoped to provide the learners with a more effective and higher quality learning environment. Finally, the website could be displayed in public to assist in learning Yami. The methodology of the research was to use needs analysis to collect the learning needs via students' evaluation. The research question was: What are the needs and requirements of students using website as an aid in their learning process? The question was then explored in three stages, utilizing different aspects. It hoped that the students' needs could be collected as extensively as possible in order to develop and enhance the site more effectively.

Chapter II

LITERATURE REVIEW

This chapter has been divided into three sections. First, it describes the role of the computer and its effectiveness in assisting language learning. It explains why languages should be digitalized or developed into internet resources. The next part presents the literature review of students' perceptions, needs analysis and their relationship to the material. It reveals that learners play an important role in developing teaching materials off-line, as well as on-line. The third part depicts the e-learning condition of common, uncommon, and endangered languages. It is very significant to point out the plight of endangered languages, which seriously lack CALL tools. Finally, it briefly introduces the study.

2.1 What is CALL?

2.1.1 The Role of CALL

E-learning technologies are increasingly widespread in education. The names, CALL, CMC (computer-mediated communication), CASLR (computer application in second language research), and other related terms standing for computer application play an important role in language education and researches. What is CALL? It refers to the applications of the computer in language education (Levy, 1997). Additionally, "CALL means learners learning language in any context with, through, and around computer technologies" (Egbert, 2005). In other words, the definition of CALL is not only characterized "applications of computer" but also broadened into the potential relationship between computer technologies and language learning. For example, a teacher can use computer source as teaching materials in a course instead of a

textbook. More possibilities in which a computer could play an assisting role exist when students feel the practice in the classroom is not enough. This viewpoint is appropriately connected with a study by Kern (2006), he proposed three roles of CALL technology: tutor, tool, and medium from analyzing prior studies. In the *tutor* role, computers could furnish the function of instruction, feedback, and testing of language skills. In the *tool* role, computers provide ready access to written, audio, and visual materials relevant to language learning, such as on-line dictionaries, grammar checkers, and database for corpus analysis. In the *medium* role, technology supplied interactive communication, distance learning, or community participation. From the previous illustration, we gain a clear picture that the role of technology is not just that of an interesting add-on tool to education, but as a fundamental tool for restructuring classroom learning (Butler-Pascoe & Wiburg, 2003). It means that e-learning is not optional but is required in language education. However, the "required" development of e-learning tool for non-mainstream or endangered language has received less attention.

2.1.2 Effectiveness of CALL

While educators and researcher know that using computer technology in language learning and teaching is necessary, it is obligatory for us to discuss what make CALL so successful. The following section has been separated into two aspects to delineate the effectiveness of CALL. The first one concerns whether or not concerning if CALL could create the same educational environment as a classroom. The other part discusses the superiorities of CALL over classroom learning and teaching. Finally, it concludes with several points of how technology enhances language learning.

Using Computer to Create A Classroom

"Could computer become a classroom?" The answer is definitely positive and ODL (open and distance learning) is an appropriately example to react the question. ODL is defined as a process of delivering information to the learners to break the boundary of space (Harry, 1999). Also, it is characterized as "flexible learning", which the users of on-line course could control the time, place, and pace of learning (Tattersall et al., 2006). Students use computers or other electronic equipments to receive the teaching from other place to immediately study from established materials. Additionally, they could have regular meetings with the instructor by ODL. The study of Blake (2004) reported that the students in the distance Spanish courses performed similarly to those in traditional Spanish classrooms on grammar tests. Chenoweth et al. (2006) used multiple directions to measure and compare oral production between on-line and off-line students. The result found that the students in online courses equivalently performed to those in the offline courses. They expressed that on-line learning provided an alternative delivery for knowledge. More information from each class would be available for the students with schedule conflicts. Therefore, it can be observed that CALL technology may provide the similar instructions with classroom and benefit learners for remote districts with the lack of teachers.

The Advantages of CALL

More and more studies demonstrate the effectiveness of CALL technologies. Instructors who are dissatisfied with the textbook seek additional information on the internet or via other technologies. Textbooks are fixed in words and pictures. Exercises in the book are restricted to mechanical drills. Unlike books, computerized lessons can be made more attractive by the use of multimedia. Practice on grammatical rules could be enhanced by animation or JAVA games. Immediate

feedback is quickly available and explanations for specific mistakes can be easily given. For example, Polisca's exploration (2006) presented the success of virtual learning environments (VLE) in enhancing independent language learning programs (ILLPs). Through students' feedback and language assessment, the results reported that the students who followed VLE-supported ILLPs developed both better language skills of Italian than those who did not. The evidence displayed that the students using a VLE program had completed the task of reading detection story but the other group had not. It proved that VLE had its function in extending exposure of the target language. The majority of students indicated that after they carried out the tasks of VLE-supported ILLP, they perceived that areas of weakness were improved. Other users commented that the flexibility of the program gave them opportunities to train diverse skills which they wished to develop. In a study by Corbeil (2007), she separated 96 students into two groups in order to test if the French Tutor package was more effective in learning past tense or not. The experimental group used the French Tutor, consisting of multimedia lessons, exercises, poems, songs, and games. The control group learned French past tense from a textbook. The pretest scores between two groups did not show a significantly difference. However, the post-test scores showed the experimental students who used the French Tutor package outperformed those in control group in choosing the right verb tense in writing.

From the previous studies, we know some of the benefits of CALL. In Polisca's study, VLE empowered students to choose the learning materials which were suitable for their specific learning needs and preferences. It reveals the benefit that CALL could fit in with the leaner-center tendency to promote students' autonomy in language learning. Adding language exposure is another advantage of computerized learning environment. Based on the trend of CLT (communicative language teaching), it is important to create opportunities to negotiate meaning with others in

the target language. Chatroom, email, Web discussion boards, and teleconferencing are channels for students use and acquire language in unrehearsed communication with authentic audiences. "Real-life conversation" fits with the expression of Brown (2001) that language needs to be "context embedded." Besides authentic or meaningful interaction, stories, pictures, animation were also helpful in supplying context that made learners receive further comprehensive input and improve their attention and retention. From Corbeil 's research, it has been demonstrated that visual aids, like animated pictures, were necessary for learners. For second language learning, comprehensible input is indeed required because a speaker needs to understand the meaning of input before he/she produces the speech (Krashen, 1989). In the French Tutor package, animated pictures are designed for the students in order to acquire grammatical features in a meaningful context. The visual aids assist students in internalizing the grammar rules. Besides grammar training, most researchers suggest that vocabulary education would be better acquired with pictures or video glosses (Hegelheimer & Chapelle, 2000). Hardison (2004) showed that visual feedback aided learners in the acquisition of French prosody and learners were able to generalize what they learned in novel sentences as well. It exhibits another benefit that computer-assisted language could facilitate to develop specific language skills.

Besides the previous statement of CALL advantages, ButlePascoe and Wiburg (2003) proposed two more perspectives. First, CALL meets affective needs of students. For example, synchronous electronic discussion, such as chatroom that lower students' affective filter, expands traditional instructional boundaries, and tracks syntactic structures and grammatical errors. In addition, electronic network communicating way provides students with plenty opportunities to express their ideas, direct their learning, enhance motivation and reduce anxiety (Kung, 2004). Providing

appropriate feedback is another effectiveness of computer technology. For example, exercises on-line could be more successful because the users are able to check the answers if they think it is necessary. It also proves that CALL is suitable for self-learning that the students could receive feedback from real audiences in chatroom. The study of Sotillo (2005) described corrective feedback in NS (native speaker)-NNS (nonnative speaker) and NNS-NNS dyads while they collaboratively worked on five learning activities through Yahoo Instant Messenger (YIM). The results showed that more corrective feedback was found in NNS-NNS pairs. Otherwise, NSs were more focused on conveying messages rather than linguistic forms.

Furthermore, CALL crosses the boundary of time. First, for the traditional classroom, students strongly depend on the notes in books to review what was learned. The knowledge they could gain is quite narrow. Computers would allow students to learn continuously through the internet or software at home. Secondly, learners can always receive up-to-date or even up-to-the-minute materials and realia afforded by computers without time limit (Colpaert, 2006; Zhang, 2002). In addition, CALL breaks the barrier of space. Distance or online learning is one of the channels available to solve problems, like the lack of teachers for the remote districts. For uncommonly taught or endangered language education, e-learning tools are absolutely the most efficient instruments available to enable students to gain more target language exposure without time and space restrictions. In section of 2.3: "E-learning condition for language education", several successful CALL examples with uncommon and endangered languages will be described.

In sum, the effectiveness of CALL is evident for many reasons. More attractive and plentiful teaching materials and exercises promote student motivation. Computer users can focus on their learning needs to choose which language skills should be

enhanced. Immediate and appropriate feedback of on-line practice helps students become familiarized with what they have learned. Besides refining specific language skills, communication is equally important in language learning and computer-mediated communication leads students to converse with authentic audiences. Moreover, CALL breaks time and space barriers so that students become active agents to control their schedule.

2.2 Literature Review: Needs Analysis of CALL Technology from Learners' Views

Language learning and teaching are flooded with computerized materials with different quality. Packages, software, teaching websites, and the internet resources with low quality are certainly required to be revised to become higher property. Other high quality e-learning technologies design is possible that not fully suit for learners' needs. Therefore, evaluation of e-learning tool from learners' perceptions becomes more and more urgent in order to meet learners' needs.

2.2.1 Evaluating CALL from Students' Perceptions

Evaluating Teaching Materials

As more technological resources become available for language learners, it is necessary for instructors to be aware of how to design or choose effective CALL materials. Besides designing a scheme before contributing to a package or learning website, evaluation is another key to making e-learning more successful (Iskold, 2003). Habbard (2003) defined evaluation as one of the contributions that practitioner both teachers and students were uniquely placed to make through their experience, through direct learner contact, and as the part of the development process of software and online learning. Heinich et al. (2002) proposed the mode "ASSURE" consisting of six steps: A-analyze who were the learners, S-state the teaching objectives and

goals, S-select the media such as package or website, U-utilize the media, R-require students' participation, and E-evaluate and modify the media, to make sure the efficacy of computerized materials. With "U-utilize", notice that not only learners, but also the tutors msut try to operate the website or software and become familiarized with how to operate in order to find which parts should be modified. "E-evaluation" and modification is the key to assess if the media can properly reach the teaching objectives and be workable for the students. Moreover, Chapelle (2001) proposed six aspects to assess CALL materials: language learning potential, learner fit, meaning focus, authenticity, positive impact, and practicalityLater, the six criteria in assessing the software's appropriateness were applied in the study of Jamieson, Chapelle, & Preiss (2005). It was successful to point out the advantage and the disadvantages of it. Through the step of evaluation, computer technologies could be more effective applied in language learning and teaching.

Evaluating CALL Technologies with Students' Perceptions

At the beginning of this study, a number of studies about CALL development and advantages in language education were stated. However, CALL research about evaluation is not sufficient (Zhao, 2003; Hauck & Stickler, 2003) and tends to focused on teachers' views. The reason may be due to that teachers bear the responsibility of choosing an effective and appropriate technology tool for their students, so they must to discover the advantages and weakness from the tools (Herring et al. 2005). We must consider whether or not evaluating learning tools based only on teacher's participation is enough. Following the trend of learner-centered education, more researchers recently have exposed different views (Brown, 2001). Learners should be invited to take part in the evaluation of learning tool (Ngu, 2006). A study by Hoven (2003) proposed learners' needs should be the basis of evaluating CALL tools. In

Heller's study (2005), she painted a clear picture illustrating the importance of learners' evaluation. She proposed that a successful CALL tool should be required to be learner-centered, to answer learner needs, and provide feedback which guided learners in their learning experience. Liaw' s research (2003) indicated that users were sometimes unwilling to accept and use available technologies even if the technology may increase their productivity. Students' views become more and more significant in order to contribute to an effective CALL tool and suit their learning needs and preference. However, it did not suggest that teachers should be excluded from the task of evaluating computer technologies. The teaching materials and activities of e-learning begin from teachers' designs and views because they hold professional insights to grasp what is needed in learning target language. Both students' and teachers' participation in evaluating e-learning tools are equally important to ensure its quality. The language learning website in the study was an on-going project developed professionally; however, it seemed that it was not sufficient for the learners.

2.2.2 *Needs Analysis*

Needs analysis has long been the cornerstone of course design, materials development, and program implementation and assessment (West, 1994). The notion of needs is defined as "a condition of lacking some necessary things" in the Oxford dictionary (2002). In the setting of language education, needs could be used to designate the questions of teaching and learning (Decamps & Bauvois, 2001). In other words, the term, needs, can be referred to the questions of "what is lacking" or "expectations". The previous studies explain "needs analysis" could grasp students' demands. The illustration may not enough. In broader terms, needs analysis calls needs assessment, described as the process of determining the needs for learners who

require a language and arranging the needs according to priorities (Richards et al., 1992). Needs analysis covers a vast field which collects and analyzes the needs and applies the results in the creation of teaching materials (Decamps & Bauvois, 2001). In the same trend, e-learning tools design also relies on needs analysis. According to Teeler and Gray (2000), it suggested that analysis of students' needs from their previous experience with computers was the first step to devise an internet-based course. Similarly, Colpaert (2006) proposed that pedagogy-driven design for on-line language learning began from a detailed specification of what was needed for education in a specific context. Certainly, the prior statement points out that needs analysis should be applied in traditional and computerized language education. Understanding learners' perceptions not only is the starting point for devising syllabus, course, and material but also the ending point for assessing whether or not the design is fully elaborated to fit the teaching objectives and help students reach the goals. The following section shows the elaboration for needs analysis by introducing different approaches to it included target-situation analysis, present-situation analysis, strategy analysis, means analysis, and learning-centered approach.

Approaches to Needs Analysis

Target-situation analysis (TSA) is a rigorous model devised by Munby (1978). The core of TSA model is 'Communication Needs Processor' that the researcher has to organize the variables affecting communication needs. It focuses on the profile of students' needs at the end of a language course used to convert or draw up the sequenced syllabus. Munby's model attempts to be systematic but inevitably become inflexible, complex, time-consuming, and unpractical (West, 1994). Secondly, present-situation analysis (PSA) (Richterich and Chancerel, 1980), stressed ascertaining the state of students' language development at the beginning of the

course. It collects the information about their level of ability and views on language learning and teaching through surveys, interviews and questionnaires. Thirdly, strategy analysis devised by Allwright (1982), is to help students identify their preferred strategies of achieving the skills and it is important that educators should design the syllabus to match up different learning strategies. However, it raises a problem that teachers might perceive these strategies inappropriately and inefficiently in the realistic classroom. The fourth approach is means analysis proposed by Holliday and Cooke in 1982. It involves that a study of the local situation, such as the teachers, teaching methods, and students' facilities, etc. to judge how a language course may be implemented (Jordan, 1997). Holliday (1994) developed it further into "environment-sensitive teaching approach", mentioned that social context may make teaching methods improper for the students due to cultural differences.

The final approach of needs analysis, "Learning-centred", inferred that learning is totally determined by the learners (Nunan, 1988). Hutchinson and Waters (1987) advocate method, "learning-centred", proposed that learning is like negotiation between individuals and society. They further sub-divide needs into three different aspects, necessities, lacks, and wants. "Necessities", objective needs, contain the meaning of what learners must do to actually require the language in the target situation. "Lacks", also called the objective needs and deficiency analysis, represent the gap between the target proficiency and what a learner has known already. "Wants" or subjective needs focus on what learners thought they need to do in order to learn. Because "wants" are considered the elements that must not be ignored in language education corresponded to learner-centred fashion, it receives high recognition by researchers. Bowers (1980) noted that students would learn best what he wanted to learn. Similarly, Jordan (1987) also supported the point that learners would have certain needs but conflicted with the course syllabus. For example, a language course

focuses on writing skill but the students would like to develop speaking skill, too. It is not easy to solve the problem but it is necessary for the course designer to take these "wants" into consideration. In other words, learners' involvement is beneficial in the process of needs analysis (Nunan, 1988). Similarly, users' view should be included while developing e-learning teaching materials (Lwo, 2004).

The previous research is evident to show the importance of needs analysis in teaching and learning in off-line or on-line education context. Though the course designer has grasped what are needed to do in acquiring the language, it seems that it is not enough without understanding students' needs. In other words, target and learning needs are both important. In the same way, both teacher's and learners' opinions are equally essential in constructing teaching materials and evaluating the outcomes of implementing it. The context of the study followed the current as well.

2.3 E-learning for Major, Uncommon, and Endangered Languages

Before discussing the E-learning context for ICTLs and ELs education, it is necessary to know the differences between less commonly taught languages and endangered languages. Less commonly taught languages (ICTLs) or non-mainstream languages such as Thai, Bahasa, and Indonesian are spoken by very large population groups but are not taught, often for historical or political reasons, in the United States (Percoda, 2004). Endangered languages (EL) are ones in danger of extinction. According to Terralingua's study (2000), endangered languages are those which will soon cease and are no longer learned by children. It is horrible that more than six thousand languages are in danger of disappearing (Ward and Genabith, 2003).

The following section, it will introduce several CALL examples for LCTLs and ELs. The final part, it will specifically describe the context of ELs in Taiwan.

2.3.1 E-learning of Mainstream Languages

The first section described CALL research methods for mainstream languages that had been involved in e-learning technology, especially for software or packages. In this area, concentration lies on the description of language learning websites.

Dave's ESL Cafe's (http://www.eslcafe.com/search/) is the first excellent website resources for English learning. It provides 3024 useful links which are under 78 categories listed with word order. Learners can find what he/she wants in learning English. For instance, if learners need to learn English for specific purposes, like business English, they may use the links in the categories like, "Business English", "Job", or "TOEIC" etc. Students who need to improve general English could choose the links to find some topics of daily life information in English such as "Food", "Drama", "TV", or "Travel" etc. Maybe some learners would like to improve their language skills. They can find what they want in the links of "listening", "speaking", "phonics", or "Writing" etc.

The second quality example is Aardvark's English Forum (http://www.englishforum.com/00/). It includes several sections, such as *Latest news from the BBC*, *Today's Specials* (For example, users could click this part for today's famous quotations or famous English idioms, etc.), *Web Directory* (Users can gather information about all sorts of various topics, like arts, health, business, etc), and so on. In addition, the homepage in this website is well-organized so that visitors can have a clear picture to search information from students' section or teachers' section. It contains lots of mixed and different but interesting links to the homepage that indeed immediately facilitate students to contact with present days from around the world, and it also gives users a chance to become more familiar with the real-world life abroad as well as getting current trends simultaneously because all news are authentic and reliable in this website. Besides, in this website, it supplies

with lots of interactive exercises for visitors with mixed levels about grammar, vocabulary, and idioms. Thus, in this sense, students can examine themselves and practice those language skills. Specially, after taking every exercise in this website, it will not only give you a total number score but also supplying feedback and explanations of your wrong answers with visitors. In other words, those resources are undeniably useful for improving student's English proficiency when linking this site. Finally, this website also consists of "Students Message Board" where you can leave your own messages to share your ideas to other visitors. You can add your questions on the board also. Apart from this advantage, this site is very convenient in that there is an on-line dictionary; therefore, it is beneficial for students to enhance their reading ability as well as increase their stores of vocabulary.

More mainstream language learning internet sources can be found by searching famous portal sites, like Yahoo or Google. The users insert the keywords that they want. The study only chose two completed sites for comparison with the e-learning context of LCTLs and ELs.

2.3.2 E-learning of Less Commonly Taught and Endangered Languages

The development of e-learning materials is not currently prevalent because of limited financial resources, narrow technical resources, and lack of native speaker informants (Ward & Genabith, 2003). Though CALL materials for less commonly taught and endangered languages are much less popular than major languages, there are some successful examples to enhance learning for these languages.

The first example is CAN (Computer-assisted Ndj bbana) project. Ndj bbana is an indigenous language spoken by 150 Kunib dji people who live around Maningrida in the North of Australia. Because the level of printing Ndj bbana literacy is low, the community members have repeatedly requested the maintenance and delivery of Ndj

bbana bilingual program. CAN uses "talking box" displayed touch-screen that makes teachers and students contribute integration of pictures and print of Ndj bbana. The results show that Kunib dji children are willing to access the tool to create their works. The teachers feel that using CAN in creating Ndj bbana teaching materials is more convenient and effective (Glenn, 2002). The long-term advantage is that the students' work and teachers' materials can be displayed on-line and more people in the world can contact with the aborigine language.

The second e-learning tool for Hindi language learning is Vidyarambh – The Hindi Tutor. It should be noticed though Hindi is the main language in North India, the study views it as LCTLs according to the aspect in US or UK. The CD-ROM, focuses on developing listening and speaking skills consisting of rich songs, stories, riddles, idiomatic phrases, and games. Yet it is not totally excluded writing skills. The program uses animated graphics to make users practice Hindi alphabet. In addition, Vidyarambh tries to provide authentic content while using many of the interactive capabilities of multimedia and the screen management is well-designed with easy to read and graphics that are attractive and culturally appropriate.

The program intends for beginning-level users of Hindi. It also contains additional materials for the intermediate and advanced-intermediate levels but it lacks any interactive activities for it (Sohonee & Patel, 2007). Despite the deficiency, Vidyarambh – The Hindi Tutor is on of the admirable CALL tool competed with the mainstream language ones.

The final superior sample, SEAsite (www.seasite.niu.edu), one of language learning websites for Southeast Asian languages, like Indonesian, Tagalog, Thai, Khmer, Lao, Burmese, and Vietnamese. It is the project supported by Northern Illinois University with the purpose of providing language instruction and other cultural, political, and social information about Southeast Asia. These materials could be

developed for dissemination and use over the Internet and everyone will be freely accessible without charge. It has been developed for four years which provides texts, audio, pictures, on-line dictionary and interactive exercises. The site is used by hundreds of teachers, students, business people, and travelers (Henry and Zerwekh, 2002). In addition, SEAsite pages include a number of advanced, interactive elements that we may not have seen in more traditional Web sites of LCTLs. For the further step, the study chose the language of Indonesian for detailed expression because it contains more information about language learning and teaching.

In the area of Indonesian learning, it includes vocabulary, grammar, sentence, conversation, and cultural information which all supplies sound track of real people pronunciation demonstration and English translation. In addition, the arrangement of each lesson is closely related to Indonesian culture. Like leaning words about food recipes, it would comprise a short text about Indonesia food and draw out the required and related vocabulary for the topic. Users could have various choice of leaning from the site. If a learner wants to learn Indonesian in a short time, he or she could select the seven days through the course of "Belajar Bahasa Indonesia Dalam Tujuh Hari" (means learning Indonesian in seven days simple steps to learn Indonesian in a short time). The content of seven lessons involved in numbers, politeness, taking taxi, simple sentence patterns, and asking questions. Each unit contained about ten vocabulary teaching with English translation and sound track and it would have a short explanation why you need to learn the words and how you apply in Indonesia. If the seven days course could not satisfy the users, they could change their mind to learn other vocabulary, like colors, vegetables, animals, or other word used in Indonesian daily life. To the further exploration, each group of words would provide plenty of pictures and the related short stories which provide the cultural information and context to make students understand more about the word. In addition, the

practice games are attractive and helpful for reviewing the words. Figure 1 shows "picture drag and drop" game that the user needs to drag the right fruit name in the right color by mouse. The bottom of "Judge it" could give the learners immediate feedback or they could click "Show answer" to memorize the words and then to do the next questions.
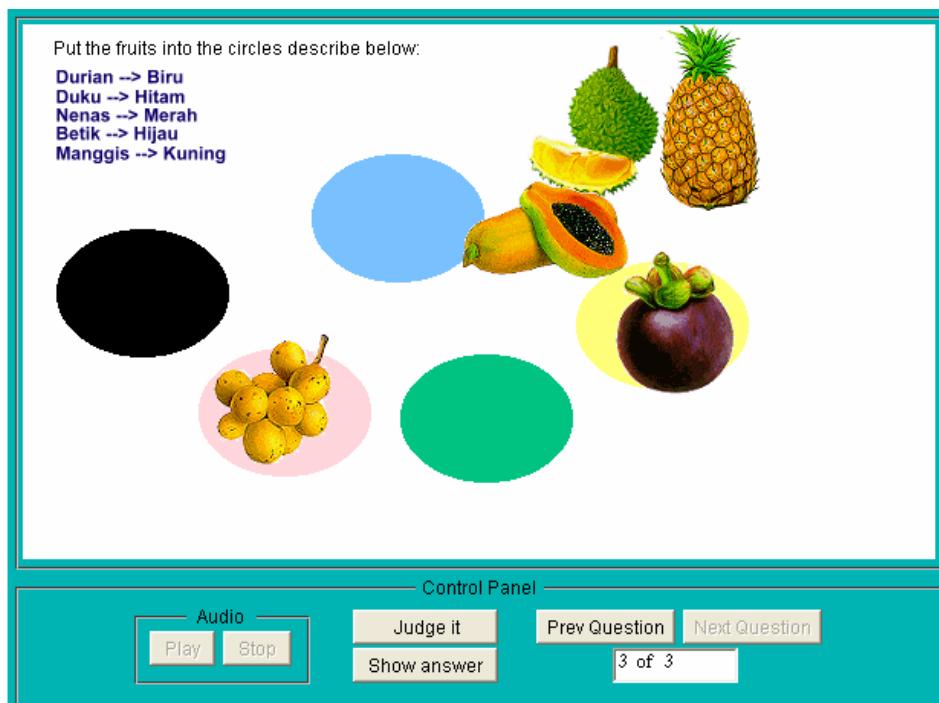

Figure 1. Exercise of "picture drag and drop" in the SEAsite
 (adapted from http://www.seasite.niu.edu/)

Not only for the beginners, but the intermediate and advanced learners could find what they want for Indonesia in the site. For instance, it provides Indonesian cultural information, folks, and news included sound track for full text. Also the on-line dictionary is very convenient for the users to look up the new words all the time.

Overview SEAsite, every section for language learning contained plenty assisted pictures and interactive practice games which attract learners' attention and motivate their learning. The function of sound track makes words and texts alive and students

could listen to the pronunciation from real native speakers. Cultural information yields the context which is benefit for students more understanding the word or sentence meaning. This website is a good model for those who would like to design a website to maintain non-mainstream or endangered languages.

2.3.3 The Endangered Languages Context of E-learning Materials in Taiwan

In Taiwan, non-mainstream or endangered languages, such as aboriginal languages, seriously lack internet resources for language learning and teaching. This paper cites three examples of using computer or electronic materials to teach aboriginal languages to illustrate the plight in Taiwan.

The first one example was to use video recordings to make the electronic materials of Atayal language. The teachers at Xian Ming elementary school in Yi-Lan firstly trained the pronunciation of students and then recorded it by videos. The second step was to do film editing and add subtitles. Finally, these videos were put on the school's homepage (www.cswes.ilc.edu.tw) in order to provide continuous practices for the students. However, the limitations of computer hardware and funds were greatly influenced on the quality of this internet resource (Chen, 2001).

The second one was to make e-books of Amis language. This example was more successful than the previous one because the e-books were the material for native language learning in Kaohsiung city. It adopted the software of flash which could provide the functions of making interesting animations and sound effects for the e-books (www.mcps.edu.tw). Recently, the second volume was completed and the third one was on the stage of planning (Zhou, 2002). These two examples show that E-learning actually provides the benefits of aboriginal language learning. However, it is still lack of the website containing complete teaching materials.

The third one is the website for the "Center for Aboriginal Languages Cultures

Education" established by National Chengchi University in Taiwan.
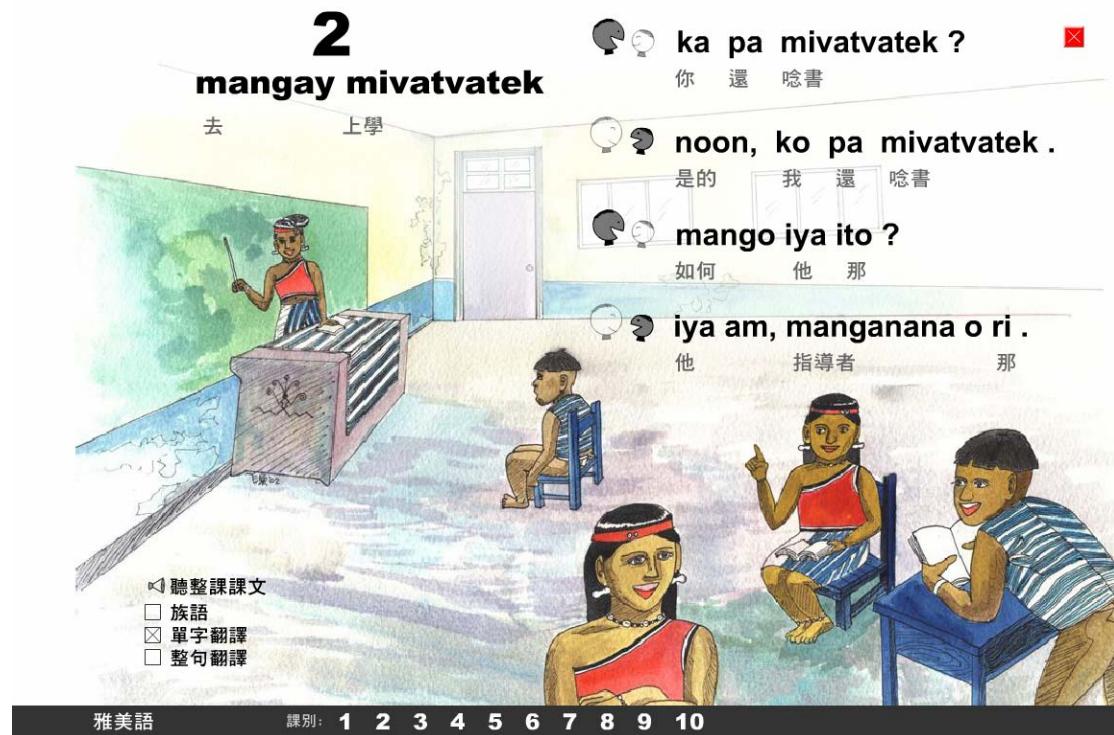

Figure 2. Teaching material of Nine-Year Compulsory Curriculum with sound demonstration (adapted from http://www.alcd.nccu.edu.tw/index_0.html)

Figure 3. Multiple choice of practicing aboriginal language.
(adapted from http://www.alcd.nccu.edu.tw/qgm/qgm_exam_start.php)

It contains the teaching materials of a Nine-Year Compulsory Curriculum in

aboriginal language teaching including in text reading, vocabulary teaching, sentence patterns, and conversation with related pictures. Additionally, it provides sound tracks and students could select whether the screen shows the Chinese translation of each word, whole sentences or neither. Figure 2 presents the example of Yami language material with the topic of "going to school" and the screen shows Yami and translation for each word but not the whole sentence. In addition, it represents that the material gives the students the language context with the culturally appropriate picture; thus, Yami input could be more comprehensive and enhance students' attention and maintenance. After the learner finishes the lesson, he or she can go to another section, an encyclopedia of each tribe (民族小百科), divided into three categories, "level of The learners could select the sub-category, language, of "subjects" to do the practice. The type of exercise is multiple choice which contains pronunciation of real people and immediate feedback (see Figure 3). However, the questions will appear randomly and could be any of the aboriginal languages. It means that even if the learners' target language is Yami, but it is possible that the exercise practices of Amis or Atayal but not Yami. For example, the left side of Figure 3 shows the practice of Paiwan language about "What does *senai a mapulat (sing a song together)* mean?" and the right one is the feedback that tells the users "To think the question again. The answer is not correct!"

Furthermore, when the user finishes a series of questions, the outcome only presents the total points, it does not show which questions are correct or wrong. Also, it does not display the corrected solutions for the questions that have been answered incorrectly. The students may acquire no knowledge but only enjoy the feeling of guessing the items. If the site could firstly sub-categorize the exercises into different ethnic groups and then provide feedback on the students' answers, it would be more effective for the users to practice what they have learned about the target language.

In conclusion, these examples demonstrate could be observed that e-learning materials for aboriginal languages are apparently scanty in Taiwan. The first two instances reported that it lacked completed teaching materials for these languages. Though the website of third example contained a series of systematic content, it could not adequately help students so much.

2.4 The Present Study

2.4.1 About the Project of the Yami Language Learning Center *(http://yamiproject.cs.pu.edu.tw/elearn/?lang=zhtw)*

The plan of "Yami Language Learning Center" is derived from the project of "Digital Archiving Yami Language Documentation" (http://yamiproject.cs.pu.edu.tw/). It combines with the professions of applied linguistics and information technology in order to create adaptive materials and assessment of Yami learning. The goal of the site is to provide more chance of self-study for the urban Yami youngsters and other learners of Yami as a second language (Rau et al. 2005). Also its content could be used in teaching Yami language face-to-face or distance education. For the further step, e-learning could increase students' motivation to participation more in their learning process because learners chose learning tasks and assessments according to their objectives. In other words, the website hopes to provide individualization to fit students' different needs and then promoted students' participation. Finally, the students would become independent learners who can master their own learning. In order to achieve the goal, four issues including topic selection, authenticity, complexity, and multiple perspectives are taken into consideration in the project (Rau et al. 2005).

Project Members and Their Works

The primary investigator (PI), Professor Rau, and her Yami collaborator, Dong, spent ten years collecting the corpora of Yami language. Dong is the native speaker who takes charge of connecting with community members in Lanyu to afford the narrative data. She also transcribes the data into the Roman spelling system and translation of Chinese. From these two instructor's hard work, the systematic teaching materials of four volumes are produced. In order to computerized them, Professor Rau invited the co-PI, Professor Yang, who is an expert in digital archiving documentation, network programming, and systems analysis and experienced in creating digital museum to participate. Dr. Rau and Dr. Yang regularly co-hosted the weekly meeting to discuss each member's working progress of the site.

Table 1. Project investigators and members and their work for the Yami language learning website.

Name	Career	Work
Dr. Rau	Primary investigator (PI)	Take in charge of the project, especially for the website content.
Dr. Yang	Co-PI	Take in charge of the project, especially for the interface design and technical problems.
Ms. Dong	Consultant	Provide corpus and connect with the native speakers.
Ann	Assistant	Deal with the sound track and other affairs.
Guo	Technical member (TM)	Update the website.
Jasmine	Graduate student	Game editing and proofreading.
Karen	Graduate student	Spectrogram editing and proofreading.
Davis	Graduate student	Proofreading.
The researcher	Graduate student	Proofreading.

During the summer vacation of 2006, Dr. Rau and Dong improved the teaching

materials of the third and fourth volumes and taught the revised activities to the students. The four graduate students from the linguistic group of the English department and an assistant, Ann, learned the teaching materials of the four volumes during the summer vacation of 2006. It was helpful for them to translate the grammar analysis into English. After that, they sent the works to Dr. Rau to make sure the English translation was correct. Finally, they were posted on the site by another technical member (TM), Guo.

One of the students withdrew from developing the site because he had completed his own job and I joined in the research team in 2006 fall. I was originally one the students taking the Austronesian course and found myself interested in studying the development of the Yami language center. It benefits me conducting the research because I understand more about the website design. Additionally, other graduate students in the project (See Table 1) and I proofread the content of the site for two times weekly. Each student was responsible for two lessons in order to unify the punctuation of English and Chinese versions and check the accuracy of the word descriptions and sound track of each lesson, dictionary, and grammar section. After the work, these mistakes are modified and updated by the TM.

Beyond translation and proofreading, some of the project members had their own special jobs. Ann was in charge of recording the Yami narrative data that Dong recorded with the native speakers to produce the corpora. Ann needed to edit the data and delete the mistakes and bridge gaps in the conversation. Next, she used the "Audicity" (http://www.afreecodec.com/win/317/audicity-audio-recorder/) program to cut corpora into sentences with the consultation of the teaching materials and the TM put them in order in the database and displayed them on the site.
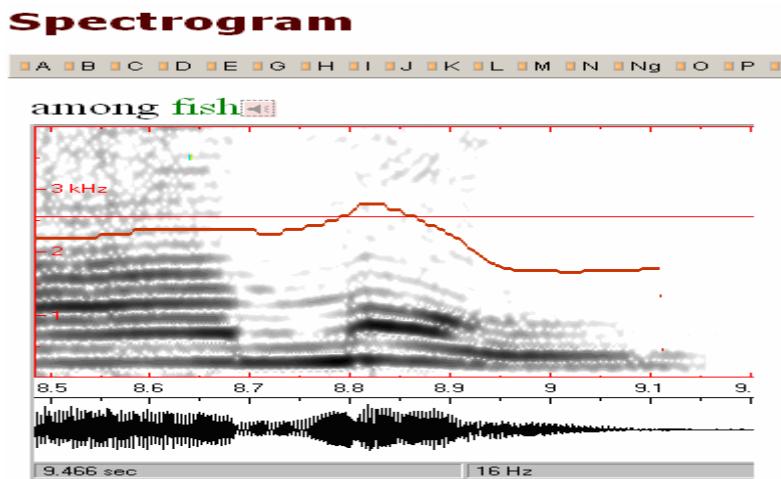
Figure 4. Spectrogram in the Yami language learning center

(adapted from http://yamiproject.cs.pu.edu.tw/elearn/spectrum.php)

Figure 5. The word and sentence exercises of spectrogram in the Yami language learning center
(adapted from http://yamiproject.cs.pu.edu.tw/elearn/spectrum.php)

One of the graduate students, Karen, specialized in creating "Spectrogram" from letter A to Z with the program of "Praat" (http://www.fon.hum.uva.nl/praat/). Figure 4 and 5 are the spectrogram for letter "A" and its pronunciation in sentences and other words. In Figure 4, the darker section represents the accents and higher hertz and

users can click the pink bottom to listen to the sound with Dong's demonstration. Karen was responsible for writing down the manual of simple steps for creating spectrogram from Praat. It can be downloaded from the website of Digital Archiving Yami Language Documentation. In addition, "Pronunciation practice" in Figure 8 only employs the pronunciation for all the words and the assistant, Ann, is making an effort to create sound tracks for each word.
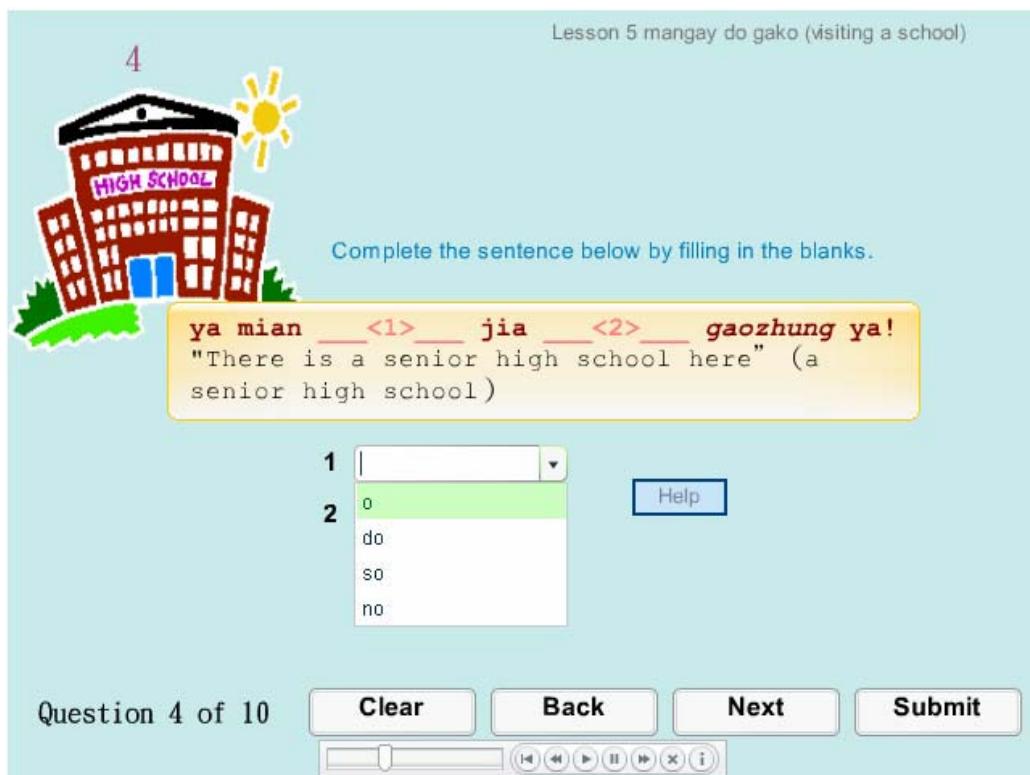
Figure 6. Images of game practice of lesson five.
(adapted from http://yamiproject.cs.pu.edu.tw/elearn/data/1_1_eng/1_1_eng.htm)

Another graduate student, Jasmine, managed the practice game design for forty lessons through the "Captivate" program (http://www.adobe.com/products/captivate/). Before creating the exercises, she participated in every class in order to grasp the key concepts of each unit, such as the text, grammar, replenished content, or what the instructors emphasized. The next step was to devise the question type, such as

multiple choice, cloze, and matching game and then she would list all the points to create the content of each item. If she did not ascertain the accuracy of the questions, she would mail to Ms. Dong in correcting the content. The fourth step was to search for appropriate pictures related to the topic and select excellent background music to attract the users' attention. The final step was to insert questions, answers, pictures, and music in Captivate. Jasmine really paid lots of efforts on the games designs that one lesson may take six to seven hours. Figure 6 was the practice for lesson five of the first volume and the question type was to fill in the blank. It would give hints by clicking on the "Help" function when answering the question. In the bottom of the picture, the user could "clear" the answer and choose it again, go "back" to the previous items and "next" exercises. The users had to press "Submit" to send the response. After finishing all the questions, the screen would display three choices for the students doing the next exercise for other lessons, reviewing the quiz so that the students could study what was correct and incorrect, or mailing the quiz to themselves and the instructors. The finished products were displayed on the site and shared during the weekly meeting with each member. She hoped that these practice could assist learners in reviewing what they had learned. Jasmine's hard work in making learning games work successfully attracts users to browse the site. Especially, the students at Lanyu junior high school showed their interest in playing the games in the second stage of the study. Also the graduate students in the third stage strongly depend on the function to review what they learned in the classroom. They express that they get a clear picture of some grammatical forms through the games.

Finally, the technical member, Guo, takes the responsibility of maintaining and updating the homepages of the site all the time. If the content is incorrect or the typesetting is inappropriate, she would adjust them in the database or used html language.

Figure 7. Overall structure of each lesson.
(adapted from http://yamiproject.cs.pu.edu.tw/elearn/reading.php?sn=615)

Content of the Site

The website contains complete Yami language forty lessons of four volumes. They are divided into three language proficiency levels, beginning, intermediate, and advanced, according to word frequencies and complexity of grammar with consideration of the capability norms of the Nine-Year Compulsory Curriculum (九年一貫能力指標). In addition, the materials are designed with the principle of CLT (Communicative Language teaching) focuses on forms. It means that students can learn Yami structures in the meaningful context. Each lesson stresses on listening, speaking, reading, and writing skills consisting of five sections: (1) Text reading with sound tracks of the native speakers, (2) Grammar analysis, (3) follow-up activities, (4) Demonstration for the activities, (5) Exercise (see Figure 7).

Therefore, each topic of the lesson is arranged in a scenario setting related to the context of daily life, customs, and society in Lanyu. The first and second volumes focus on what the Taiwan students see and hear when visiting Orchid Island. In the first volume, greeting, self-introduction, village and natural environments are explored. Students move on to weather, flying fish season, etc. in the second volume. The third volume includes dialogues based on Yami folklores and narratives collected previously by Dr. Rau and Dong, such as, go fishing, fish for men and women, and miniature pigs. The lengthy corpus reading is the main content of the fourth volume, consisting of myth, traditional crafts, ceremony, church life, etc. The users can choose the suitable learning materials themselves. Various choices for the users show that the website has provided certain individualization. Further, supplementing learning, grammar analysis of each lesson is organized from easy to difficult. Because the target users, such as college students, are equipped with abstract thinking, it introduces general ideas of grammar rules in the first volume. Then, these rules will be continuously reviewed in the following three volumes. The website designers expect the students to be able to master overall Yami grammar points through out the edition. Furthermore, the on-line dictionary arranged by alphabetic order for the learners to look up the vocabulary and the function of the learning log setting that allows the students to the time they have spent on the site.

The Way to Use the Website

If the teachers of Yami language would like to use the material face-to-face, they can teach each lesson in four hours and finish the four volumes in two years. The site can also be applied as virtual classroom for self-learning or assisting classroom learning. The users can preview the conversation in text reading with the sound tracks and grammar analysis before the class. The follow-up activities and demonstration are

the extended content of text and grammar, consisting of practice of sentence patterns in a context. The users can choose one of them to practice with their classmates after school are supplied in each lesson. However, these functions seem not to satisfy with the learners. Through the research and the efforts from the project members, the site has been modified to more closely meet to the users' needs. More will be illustrated in the section of Result 2.

2.4.2 The Present Study

The study attempts to develop the website, Yami language learning center, for endangered language learning in Taiwan. It contains a series of systematic teaching materials which are separated into three different proficiency levels. The resources are quite precious but some deficiencies lead to a decrease in the effectiveness when using it. The purpose of the research is to use needs analysis to investigate the learning needs from students' evaluation of the using experience and then enhance the site's usability in the future. The research question is: What do students require when using a website as a learning tool? The question has been be explored in three stages with different aspects. During the beginning stage, the site is firstly used and viewed as an assistant role. It described students' needs in three directions: (1) students' expectation before using the website (2) students' evaluation of the website from their using experience, and (3) students' learning difficulties and strategies in the classroom. For the second stage, the website was partly modified in response to the results of the first stage. It collected the learning needs from a gorup of native speakers on Orchid Island. In the third stage, it was back to the original subjects, inviting the graduate students to analyze the learning needs for the website. Especially, they used the site as a preview for the lesson. It explored more opinions in deeper detail to better the materials. Through the various group of participants and directions, it strives to ensure

that students' needs, or even the target ones, could be collected as extensively as possible.

Chapter III

METHOD

The study employs a mixed design, especially focused on interview in order to clarify the learning needs from the hands on using experience and perceptions of different groups of users. These opinions are valuable in developing the Yami language learning website. The research was divided into three stages. In the first stage, it discovered the views of seven participants who were the first group to use the site. The role of the site was to assist their learning after school. In the second stage, the field trip to Orchid Island solicited the different opinions of the native speakers. It used both quantitative questionnaire in collecting the general idea of the 116 students and selected five of them who were appropriately participated in the study for the qualitative part. The investigation of these two stages stressed mostly on the content and interface of the site. The third stage separated the role of website. One part investigated the needs when the four students used the site in reviewing classroom instructions and the other collected their perceptions with preview the lessons. It took a longer time than the other stages to complete in order to more deeply detail learning needs from each class.

3.1 The Setting and Participants

3.1.1 Seven Participants as the" First" Website Testers (2006 spring)

Seven graduate students in the Austronesian seminar class

The participants in this study were two male and five female graduate students, of whom all majored in English, in the course of Austronesian language seminar. The reason that the class was held at Providence University was to offer wider

opportunities for Chinese students to learn an Austronesian language in Taiwan. Three students were from a linguistic group which were eager for linguistic analysis and four other students were from a TESOL group who had taken the course on computer-assisted language learning. One of the TESOL students dropped the class due to personal reasons. However, the student expressed her interest in Yami language learning and had used the website for a period of time, so his/her experiences was still valuable for consideration in the study.

Classroom Context

Each class of the course was separated into two parts. The first part took two hours in journal article reports and discussion of Autronesian language linguistics or language learning and follow-up discussion. The other took one hour in learning Yami. It was the center of the study to find students' needs of learning second language. Two teachers, Dr. Rau and Ms. Dong, co-taught in the classroom. Dong was a native speaker and responsible for teaching Yami to provide more native speaker's input for the students. The class often started with Dong's demonstration of how to pronounce conversation in the activities. Then she would interact with the students in practicing the example sentences. After the students more familiarized with the content, they would begin conversing with each other for more speaking rehearse. Dr. Rau took charge in analyzing the structure of Yami in order to let the learners understand Yami more systematically. Speaking and grammar were both the focuses in learning Yami.

Students' Assignments

The homework types were various including sentence-making, writing self-introduction, verb analysis, singing a Yami song, and creating on-line exercise with Hot potatoes (http://hotpot.uvic.ca/), Quia (http://www.quia.com/), or

Macromedia flashcards (http://www.adobe.com/). All the assignments were mailed to the instructors in correcting the errors. Especially, two of students' works, the record of singing a fishing song and on-line exercises, were displayed in the site; however, it was a pity that the latter one was disappeared out of the trial period without payment. Anyhow the learners were empowered in designing the site, it not only made them more well acquainted Yami language but also enhance the motivation in learning it.

The Role of Yami and the Website

The students were the beginners to learn Yami language as second language or subject in the course of Austronesian languages seminar. They studied both the structure of Yami language speaking it. Therefore, the role of the website is to assist the content of classroom. The students use the website as the continuous study of preview or review of the Yami language lessons in the class. In deeper explanation, second language refers that the classroom target language is readily available out there (Brown, 2001). It means that if the students learn Yami as second language, they would hear or required to use Yami in their daily life. On the other hand, if the learners view Yami as a subject, they need not to speak Yami outside the classroom. In the study, most students tend to learn Yami as a subject through the investigation. However, it can not make sure that there is no student learning Yami as second language. Classroom is always dynamic (Brown, 2004). Students may change their perceptions of the language during their learning process. It requires continuous interviews to get their deeper thoughts. However, the study could not involve in these ideas due to time limit.

3.1.2 Field Trip to Orchid Island of "the Second Stage" in 2006 Winter

During the first stage, the site of the Yami language center was used by the first

group of students and lots of insightful opinions about learners' needs for the on-going website project were articulated. After a period of time, these needs were realized on the website by the project team work. It was the time to introduce the website to another group of target learners, the students at Orchid Junior High School. Thereafter, the stage would then focus on the perceptions of native speakers.

The Setting: Lanyu Junior High School

The setting, Lanyu Junior High School, is located in Yayo village and has convenient traffic that is one kilometer from the port and six kilometer from the airport. It is a beautiful and graceful place that faces the sea with mountains on the other side. It also possesses its own website (http://www.layjh.ttct.edu.tw/) which introducing the school and posts the latest news. 34 teaching and administrative staff, 139 junior, and 28 senior high school students of ten classes are the part at the school. The gatekeeper of the setting is a great teacher who always bears students' affairs in her mind and is also enthusiastic in giving suggestions for the research.

The Five Native Speakers for the Qualitative Design

The quantitative part invited all junior students to participate in the study. The five participants who were selected for the qualitative research consisted of three male and two female learners. Two were from second grade and the others were from third grade. Moreover, four of the students were from Iraralay village and one was from Iranomilek. Only two of them had the experience of using website and software to learn English.

The five students were considered the appropriate choice out of all the students for three reasons. First, the five students were selected by the teacher as having better language proficiency and being better able to comprehend the teaching materials.

Second, only the junior high school students have a one-hour course of native language per week, while senior high school have one-hour of Yami culture course. In addition, the Ministry of Education announced that aboriginal students need to pass certification of native language (族語認證) and then they can have bonus points in the Basic Competence Test for Junior High School Students. From the two aspects, the participants would hold higher motivation in using the site. Third, they are more familiar with Roman spelling and Yami writing system than the first grade students. If they could not understand Roman spelling, they would not be able to follow the content of the site.

The Textbook and Yami Language Learning Center

The course of the Yami native language only occupies only one hour in a week at the school. Before publishing the materials of a Nine-Year Compulsory Curriculum, they use "Pacinanawan no Tao do pongso a Lomaji (Exercise book of Yami Roman spelling)" as textbook. Each lesson is arranged with introduction of one letter and four related vocabulary with Yami pronunciation, Chinese translation and cultural appropriate pictures. In addition, students can learn how to articulate the words by the CD-ROM after school. However, only four vocabularies for one-hour class is not sufficient for the native speakers who actually need more language exposure. Thus, the field trip to Orchid Island is very important in introducing the Yami language learning center in extending their language acquisition. It is excellent that the website could be available now in "Lanyu aboriginal education language resource center (http://www.layjh.ttct.edu.tw/newlanyu/index.htm)." More native speakers will know they own good language learning resources.

3.1.3 Four Graduate Students of "the Third Stage" in 2007 Spring

The Setting: the Difference with the First Stage

The setting of the third stage went back the Autronesian language class again at Providence University after one year. The structure of the course was most similar to the first stage but it had some differences in detail. First, the teaching objectives were not totally the same. In the first stage, the course named "Austronesian linguistics Seminar" tended to not only cultivate students entering the Austronesian field but also invited them to "develop" the Yami language learning website. For this stage, the goal of the course focused on Yami structure and sociolinguistics and taught basic Yami language with "using" of the e-learning materials.

Otherwise, it was different in conducting the part of learning and teaching Yami. First, it increased the task of translating Yami into Chinese. For example, the instructors, Dong and Rau, interacted with each other in Yami and then students needed to translate it into Chinese. Secondly, it extended oral practices during the class. After the learners finished two lessons teaching, they would be told to prepare the oral test for the next week. The students had to review what had learned, like vocabulary, sentence patterns, and using the sound tracks in listening to the pronunciation. While they started to speak Yami, all the learners required to create a context. The teachers would not bother them and then told their mistakes after completing it. Thirdly, doing on-line exercise was the unique homework that was not happened in the first stage. Finally, they would have Yami language proficiency test at the end of the semester to check how much they had learned in the course.

Two Beginning and Intermediate Level Students

The four participants were all the graduate students who joined the study. Two first year graduate students (S1 and S2) initially took the course and the other two

students (S3 and S4) who had finished the materials in the four volumes attended in the class again and took the charge of video-recording. They received instructions from Dong's demonstration of the sentence patterns and Rau's grammar analysis every week. Also, the researcher was the user of the site for self-study and designed the varied interview questions according to their using experience and classroom observation. In this stage, it would observe and obtain more students' learning needs from different aspects.

3.2 Tools and Procedures

3.3.1 The First Stage

Tools: Interview Questions with Three Parts

In-depth interview was conducted during the data collection for the stage. The interview questions (see Appendix 1) were separated into three parts to match up with the research questions. The first part consisted of warm-up questions, expectation for the class and the website, and the time they spent in the site.

The second part was users' evaluation of the site from hands on using experience. It adopted Lwo's questionnaire (2005) which set the criteria for applying evaluation to web-based resources in education design and was assessed by forty two experts in the field of internet and CALL. It was selected because it was professional and more complete including assessing teaching materials and website interface than other questionnaires after comparing other studies. The questionnaire contained two aspects: (1) website content: relevancy, attraction, correctness, currency, and neutrality, and (2) website interface: layout, audio-video effects, interaction, and learner-control (see Appendix 1, part II). Lwo's questionnaire was utilized likert-type scale with 1-5 points to survey students perceptions of website resources in a quantitative study, however, this study was a qualitative study, so some items were deleted and modified.

First, the item of the category of neutrality was totally canceled because the website in the study was a language learning center that would not cause any political and race problem. The description of other items was changed since most participants could not understand them during the interview time. The researcher in the study modified the statement and added the explanation from consulting related literature after the first time interview. Appendix 3 clearly illustrates the original and revised version of the items and their reason and then the participants more understand the questions and the interview gets more valuable insights from their evaluation.

The final part investigated students' e-learning needs from their learning problems in the class. First, the students were asked to recall the difficulties they faced during the time they learned Yami and stated the strategies used to overcome them. Some e-learning needs were discovered and hoped to be applied to the website as a result of students' learning experience. The learning problems were separated into five aspects: listening, speaking, reading, writing, and grammar. Grammar was one of the focuses in the class, hence it was included as one of the categories in the section. The purpose of conducting interview was to understand the deeper thinking of the students. It not only collected the information on students' needs but also determined the reasons why they had further requirements.

Procedures

Two times of interviews were conducted. The first time was held in the middle of the semester and the second time was took place in the end of the course. The interviewer would tell the interview content before the day of interview and let the participants to think about it. After they had considered the questions, the interview proceeded in front of the computer that the students could always refresh the memory of the using experience on the website.

3.3.2 Data of the Second Stage

Tool 1: The Quantitative Questionnaire

The quantitative questionnaire (see Appendix 4) followed Low's study (2004) with modification. The item was categorized with the layout and audio effect (Q1, 5, 6, and 7), content (Q2, 3, 11, 12, and 13), attraction (Q4), and learner-control (Q8, 9, and 10) for the internet source. The final of it involved in options that students could choose which were the most needed for the site. In order to make it more comprehensive for the junior high students, the researcher invited three junior high school students to answer the questionnaire before the field trip. Then, its description and content were modified to make it more comprehensible for the target subjects.

Tool 2: The Interview Questions

The other part (see Appendix 6) was the qualitative study, which studied in-depth, the thoughts of some of the students who were at a high proficiency of Yami and operate each function of the site. Observation and video recordings would also be implemented when they operated the site.

The interview questions followed the design of the first stage but some of the questions were deleted due in the consideration of the different target users. It divided into three parts. The first part was their learning difficulties, strategies, and expectation for the site. The design of the second part questions were selected from Lwo's study (2004) to lead the students in evaluating the site. The final part was opened questions to let learners think about their learning needs for the site.

Procedures

The quantitative study was conducted in the computer classroom at the school. It was a huge space, consisted of 50 computers, and the students could immediately do

the questionnaire and be interviewed. In front of the classroom, it had a whiteboard, computer, broadcasting system that could control the 50 computers. They only could be operated by the teacher. The gatekeeper hoped that we would not disturb students' regular schedule and arranged students to come to the classroom to join the research during the time of native language course. Due to time limit, the students listen to the introduction by the researcher for 20 minutes to get the overall picture of the site. They had 10 minutes to operate the function of on-line dictionary and games. After that, they directly did the questionaire for 20 minutes with the deep impression of the website. The questionnaires were sent to 139 junior high school students of six classes from the first to third grade and 116 were valid in the study.

The qualitative research started from the first day when arriving on the Orchid Island. The researcher invited the five participants to use all the functions in the site for 40 minutes before the days of interview. The gatekeeper suggested that the interviews could be conducted for 40 minutes on the time after self-study in the evening. Therefore, the participants come to the computer classroom mostly at eight o'clock p.m. Before the interview, the students were asked to navigate the site again in order to refresh their memory on the first day. The investigation gathered different learning needs for the website in the stage.

3.3.3 Data of the Third Stage

Tools: Interview Questions

The questionnaire was always revised according to the condition of the participants' perceptions (see Table 2). The beginning interview (see Appendix 8) was conducted before the two new students, had used the site and focused on their expectations for the site. The second, third, and fourth investigations (see Appendix 10) put stress on the perceptions of classroom learning and using experience of the

website. The final interview (see Appendix 12) concentrated on the experience using the website as a preview for the next lesson and for self-study.

Table 2. Different interview structures in the third stage.

Time of interview	Structure of the interview questions
1st : For the two freshmen learners	Motivation for the course and expectation for the site before using it.
2nd ~ 4th : for the four learners in the Yami course	Learning difficulties, using experience, if the site did indeed effective indeed assist Yami language learning and how it helps the user. The third stage especially focused on the assessment of games.
5th : for four participants	How the users' feel when they operate the site as preview or self-study

Procedures

Five sessions of interviews and two classroom observations were included to investigate the learning needs from the four students (S1, S2, S3, and S4) who viewed the website as playing an assisting role to their learning. The process of conducting the interview begun with participants' operation on the site for 15 to 20 minutes. They could freely use any functions or materials as they wanted. After they finished it, they would call the interviewer and the interview would be conducted in front of the computer. The participants could always click on the mouse to refresh their memory.

Chapter IV

RESULTS AND DISCUSSIONS

Results and Discussions 1:

4.1 Needs Analysis from the First Group of Users in the Fist Stage

In this section, there were three separate aspects employed to study students' needs for the Yami language center. The first one discussed students' expectations before they used the website. The next one investigated students' perceptions from their using experience and explored what should be added to the website. The final aspect focused on students' learning problems and strategies in the learning process. The purpose was to collect the information that they wanted to find in the website to overcome learning difficulties.

4.1.1 Needs Analysis from Learners' Expectations

During this stage, students' expectations of the course were gathered "What I want to learn from the course?" and website "What do I want to find in the website?" before they learned the Yami language and used the website.

Table 3 listed the learners' expectations and also reflected their needs from the website. For example, S3 would like to learn Yami semantics in the class and he hoped that the website could provide lots of Yami word teaching. Most students were interested in learning to speak Yami. S4 expected that he/she could speak Yami, so he/she needed the website to teach him/her the pronunciation. Table 3 delivers an interesting message that these students (besides S4) anticipated that the website could provide cultural information of Yami. For example, S1 hoped that he could know

Yami songs and festivals. S6 preferred the pictures of Yami culture. S7 expected the site could put the information about customs or people of Yami. These messages showed that students highly expected that the site would supply culture information of Yami. "When a student is learning a language, he/she is learning its culture, too" (Brown, 2000) could reflect the situation in the study. It means that culture and language learning could not be separated. The result indicates that the learners may look for Yami culture information to assist their learning in the website.

Table 3. Students' expectations of the course and site before entering the class.

	Students' expectations of the course	Students' expectations of the website
S1	1. Learn how to preserve a language 2. Learning Yami and be able to communicate with the native speakers on Orchid Island."	**Cultural information**, like songs, customs, or festivals (e.g. Flying fish festival) of Orchid Island.
S2	Learn structure of Yami language.	No expectations.
S3	Understand semantics and social linguistics of Yami language	The word meaning, pronunciation, and grammar
S4	Learn to speak Yami.	The word meaning, pronunciation, and how to pronounce like a native speaker
S5	Learn to speak basic daily conversation in Yami.	1. Content and practice related to Yami. 2. Useful links to introduce **culture** of Orchid Island.
S6	Learn to speak Yami and then apply it to E-learning.	Pictures about Yami **culture**.
S7	Learn basic Yami language.	**Cultural information**, like food, customs, or the people (e.g. the role of male and female) of Orchid Island.

4.1.2 Needs Analysis from Users' Evaluation of the Website

In this section, the students were guided to evaluate the website from two aspects including the teaching materials and interface on the website. Through these questions and their using experience, they found the advantages and deficiencies to the site. The

deficiencies were paid more attention than the advantages in order to discover if they were the students' needs.

a. Needs of Teaching Materials

In the category, students found some components lacking in the website should be added to enhance their learning. Table 4 shows the site's deficiencies and students' views about them.

Table 4. The deficiencies of teaching materials and students' views of them

	The website deficiency	**Students' views of the deficiency**
Item 2	Does the website contain complete teaching materials	Some students thought the answer is "No."
Item 5	Does each lesson provide related and extended information in the site	All students answered "No" and they thought they need it.
Item 7	Is the site easy to be found by inserting keyword in some famous portal sites?	Most students felt the site was not easy to be found.
Item 8	Is the content of the materials interesting and motivates learners' interest?	All students thought the site could be more interesting.
Item14	Are top news posted instantly?	All students answered "No" and they needed to know the news about the course.

The first need appeared when they answered item 2. The participants had different opinions. Some students considered that complete teaching materials should include in practice and assessment that lacked in the site.

The second need was from Item 5. All the students answered that the website did not provide extended information but they really need it. Their reasons were as following:

Excerpt 1

S4: 我需要，我想學一些文化部分…課文的部分說的不夠

I need it. I would like to learn the part of culture…the content of text is not enough.

Excerpt 2

S5: 有(延伸資訊)的話，學起來會更有趣吧

If it provides extended information, I suppose that learning Yami will become more interesting.

In the section 3.1.1 (needs analysis from students' expectations), most students laid stress on culture part. Here, some student mentioned it again. It was thus evident that culture played an important role in their learning. Besides, few students expected that each lesson should provide extended knowledge, like related vocabulary or sentence pattern to assist to do their assignment (Excerpt 3).

Excerpt 3

S3: 像是寫第二課自我介紹的時候，有一些字，像是職業方面的，課本沒有教，字典也不能查，沒辦法就只好換成在課本的單字了…如果說第二課後面有提供多一些關於職業的單字會更好

When I wrote the assignment of lesson two "Introduce yourself", some words about occupation did not be taught in the textbook and could not be found in the dictionary. It forced to me to change the word in the textbook…If lesson two could provide more words about occupation, it would better.

Excerpt 4

S7: 我記得有一次我回家，想要寫(Yami)作業，可是我家的電腦沒有老師網站的網址，只有台中的電腦才有…就是在 GOOGLE 找，怎麼找都找不到…那種感覺真的很不方便.

I remembered that one time, I went back to my home. I would like to write my Yami assignment but the computer did not have the address of Yami language center. Only the computer in Taichung. I tried to find in google but I could not find it…I felt that it was really not convenient.

Then, from Item 7, the students (besides S3) found that it was hard to find Yami

language center without the address. Some students noticed about the problem before the interview. They felt that it was not convenient if they wanted to use the website any time (Excerpt 4). Another student (S1) considered that if a Yami learner wanted to learn Yami but did not join the course, he may not be able to find the website easily. Other students paid attention to the drawbacks until they were invited to try to search the site in Yahoo or Google. They inserted the keywords, like "Yami, Tao, and Orchid Island" both in English and Chinese but no one was successful to discover the site. Only one student typed the keyword, "Der-Hwa Rau" in Chinese (the author of the site), so he/she always searched the website with ease. However, if the students entered other key words, like "Yami language learning or Yami language center", they could quite easily find the website in any portal site.

The following deficiency was from item 8. Most students thought the site could put some pictures or add more colors to cause their interest. Few learners thought the content of the teaching materials was almost the same with the textbook and it seemed that they preferred to look at paper (textbook) rather than computer (site) because they could mark what was important to them. In addition, some students mentioned that if the site could add some practices, they would be more attracted to use the site.

The final need from item 14 indicated that students required getting the top or hot news related to the Austronesian course. Most students hoped that the website could put some instant information, like conference or lecture of Austronesian languages. Some expected to get message of the festivals of Orchid Island, for example, when Flying Fish Festival would be held.

In this category, there were some consistent opinions among the learners. First, all students thought they needed extended information to assist their learning or increase their motivation to use the site. Second, they believed that pictures and colors were required to add attraction to the site. Finally, they all expected that instant

information on conferences and lectures of Austronesian languages to be posted in the site. These comments were closely related to an increase in their motivation to learn and use the website. It should be noticed that the project began in 2006 and the participants were the first testers for it. Currently, one of their expectations has been realized true in that they can not receive the latest news about conferences and lectures for Austronesina language in the "Digital Archiving Yami Language Documentation" website (http://yamiproject.cs.pu.edu.tw/).

b. Needs of Website Interface

In this category, the students found some functions that should be supplied to enhance their learning. Table 4 displays the students' needs from evaluating the website interface.

Table 5. The deficiency of website interface and students' views of the deficiency.

	The website deficiency	Students' views of the deficiency
Item16	Are pictures or graphs appropriately added in the descriptions?	All students hoped pictures could be added in the description.
Item17	Does the site contain highlight markers by different typefaces or colors?	All students answered "no" and they thought the markers could assist their learning in the website.
Item23	Is chatroom available in the website?	Most students (besides S3) thought they need chatroom to discuss their learning with others.
Item24	Does the site provide the authors' e-mail, phone number, or address?	All students thought e-mail should be provided.
Item26 &28	Does the site provide appropriate practices/assessment and immediate feedback?	All students had strong desire to have practice and feedback in the site.
Item27	Does the site provide the function of learning log?	To provide learning log in recording the time they stay in the site was not enough for their learning.

Pictures on the Website

Item 16 showed the message again that students indeed needed pictures in using the website. Some students supposed that the part of text in the site should put some pictures. The purpose was to provide a more comprehensible context for the learners to understand the text (Excerpt 5). Only description with words may make them feel the site was boring (Excerpt 6). It revealed that from students' perceptions, pictures not only attracted their attention and then learned in the site but assist their understanding in reading text. The need was supported by Liu's study (2004). It discovered comic strips greatly facilitated reading comprehension and suggested that the visual aids should reflect the text's linguistic complexity to help readers process the input.

Excerpt 5
S6: 我覺得呀，雖然說課文已經有中文翻譯了，可是我還是需要圖片去提供一個情境…這樣子好像會讓我更了解課文了
I think that I need pictures to provide a context though the text has already had Chinese translation. It seems that pictures help me understand the text more.

Excerpt 6
S2: 如果有圖片的話，我會在網站待比較久…只有字的話…會有點…有點無聊
I will stay in the website for a longer time, if it provides pictures. Only words make me feel a little bit boring.

Highlight markers in grammar analysis section

The second need was from item 17 that students strongly expected that the grammar descriptions could have highlight markers. The reasons were as following:

Excerpt 7
S1: 像是文法分析的部分呀，一眼望過去，有點不知道重點在哪
For the part of grammar analysis, when I glance it around, I do not know the point.

Excerpt 8

S4: 我覺得如果網站沒有重點提示的話，我不如就讀紙本就好，因爲我自己還可以畫重點在哪裡

I think if the website does not have markers, I prefer to read textbook (paper) because I can highlight by myself to show the where the point is.

The Need for Chatroom

Next, most students expected that the website could add the function of chatroom. They thought that if they had any questions of Yami, they could immediately entere in the chatroom to discuss with other classmates. One student expressed that maybe the teacher could also join the chatroom, too; thus, they could do continuous speaking practice after school.

Importance of Connecting with the Site Authors

Table 5 showed that from the item, 24 the students considered they need not know how to connect with the authors of the site because they were the teachers in their course. However, most students took account of other students. They thought that if the students who did not take the course wanted to learn Yami in the site, it was not easy for them to find the author to solve the problems of learning Yami or using the website. When the site became more famous and was used for more learners, it was a useful comment that may be able to apply to the site.

High Expectation for Practice/Assessment

Practice or assessment was the following need with high expectation from students' learning needs. From item 26 and 28, the learners thought that they required practices to more familiarize with the vocabulary, sentence patterns, and grammar of each lesson and assessment was used to understand how much they had learned in the

lesson. Both practice and assessment should provide correct answer or immediate feedback. Practices and assessment seemed to be very important for the students because they had mentioned it in the class discussion.

Learning Log in Recording Learning Progress

The final need of website interface was learning log. Though the site had provided the function of recording the numbers they use the website and the time they stay, most students thought it could not satisfied with them. Besides recording time, the learners expected that learning log could record more their learning process (Excerpt 9 and 10).

Excerpt 9
S4: 我希望可以紀錄我點過每課課文閱讀或文法解析幾次，這樣子我會比較清楚我那一課的那一部分比較需要或不需要加強…老師也可以參考
I hope the site could record the times I click text reading or grammar analysis; thus, I will be more clear that which part I need to study again or not. The teachers also can consult with the recordings.

Excerpt 10
S7: 如果說有練習的話，我希望可以紀錄我每次練習多少分…還有如果可以的話，我希望還可以在字典的部分，可以紀錄我那些字查了幾遍
If the site provides practices, I hope it can record the scores every time. In addition, I hope the site can record which words and how many times I look up in the dictionary function.

Actually, learning log has been contributed in the project but the person in charge the job served in the army. As a result, the function is not completed and the students could not use it. The gap between ideal and reality is always diverse.

In summary, students expressed several needs after evaluating the teaching materials and interface of the Yami language center. For teaching material, the learners stated that they required extended information for each lesson to assist their learning. As for website interface, the students needed highlighted markers to remind them the key of grammar rules. Also, chatrooms should be available in order to discuss their questions with others. Finally, the present function of the leaning log on was unsatisfactory for the learner and the amount of time spent on the lesson and word count should be recorded, too. Furthermore, students' reflection indicated that pictures, practice exercises and assessment were highly expected when they evaluated teaching materials and interface. Pictures had two effects on the learners. The first was to increase attraction to the site so that they would be more interested in it. Another effect was to provide the context to assist students' understanding when they read the text. Practice exercises were expected because the students would like to master words, sentence pattern, and grammar for each lesson. Assessment should be supplied to grasp how much information they had mastered in the lesson.

4.1.3 Needs Analysis from Learning Difficulties and Learning Strategies

In this section, students' learning difficulties in listening, speaking, reading, writing, and grammar and what strategies they used to overcome them will be discussed. These findings revealed their needs to be met when using the site. The students were beginning learners of the Yami language, so their language skills were focused on a micro level, like pronunciation (speaking) or word meaning (reading).

Listening

Generally, the students did not have listening difficulties in the class. The reason

may be due to that they were the beginners, so the teachers slowed down the pace when speaking Yami. Besides, they also could look at the Chinese script to understand the meaning. Most of them tended to listen to the sound track again and again as their learning strategy. It showed that they depended on doing continuous learning after school in the site. However, they found some problems when they used it. All the students thought the pace of sound track was too fast. They expressed that they could not follow it to catch the pronunciation of a word or there was not enough time for them to look at the Chinese meaning of the script. Therefore, the students hoped that the sound track pace could be slowed down. Some students thought that the audio could have different level of playing pace, like fast, medium, and slow, to let them choose the appropriate one. Other students expected that each sentences of text reading could have a button that could be clicked to provide the pronunciation of the sentence. These comments were important that the audio of the site may be the only chance to listen to Yami native speakers besides in the class. Recently, the audio tracks have changed that the users could listen to separated sentence in text reading.

Speaking

As mentioned before, the students were beginners of Yami language, so the speaking skill in the study was focused on micro skill, pronunciation. Most students expressed that some letters were hard to pronounce, like "lima (five)", "riagen (breakfast)", and "si." Few students talked about that because Yami was Roman writing system which was the same as English, so sometimes it would influence on the learners to articulate a Yami word in English pronunciation. Other learners thought that they always could not master the accent or intonation when speaking Yami. They often used two strategies as following: (1) using phonetic symbols to memorize the pronunciation, and (2) listening to the teachers or other classmates and practicing

again and again. These messages showed that students had more problems in speaking than listening. As a result, students had more ideas about what the site should provide to promote their speaking. First, most students remarked one more time that the sound track of text reading could have separated pronunciation for each sentence. In addition, they hoped that each lesson could provide single pronunciation of longer or more difficult words. Thus they would listen to the word or sentence clearly and then repeat it more correctly. Now, the website supplies the new function of spectrogram including sound demonstration of vocabulary and sentences. Also the students can utilize the sound track of on-line dictionary in listening to each word.

Second, they considered that the audio of text reading should contain pauses between sentences. The learners could use the pauses to repeat after the audio. Finally, some students wished to pronounce like a native speaker, so they needed sound spectrum to show how similar or how dissimilar with the native speakers. These needs were closely related to their learning strategies, repeating after a model. If the site could put the comments into practice, the site would become more efficient for the learner.

Reading

The part of speaking had already discussed about pronunciation, so it would change the focus on another micro skill, word meaning in reading skill. All students supposed that they did not have reading difficulty roughly because the textbook or website all provided Chinese translation. However, they still needed practices in the website in order to be more acquainted vocabulary. All students were enthusiastic at designing some practices of each lesson and introduced them in the class. Among the designs, the teacher and students thought these practices actually had its effectiveness to make the students more familiar with words.

Writing

In this course, writing was stressed on students' assignment. The students often asked to write down sentences or paragraph that they had to substitute the words or sentence pattern taught in the class. Generally, they thought that writing Yami was not the problem for them. Nevertheless, they faced a problem in the site when they used the dictionary to write their homework. As S3 of excerpt 3 described that when he/she wrote the work of "Introduce myself", he/she would like to use a word which could stand for the truth but he/she could not find it. Then he/she cannot but change the word taught in the class or listed in the text. The current function of the dictionary was to type Yami and then find the Chinese meaning. From the difficulty of students, the dictionary may be added the function that typed Chinese and then searched for Yami words in the future. After the hard work of the project members, the dictionary can insert both Yami and Chinese to look up the target word.

Another student (S1) proposed a comment that maybe chatroom would be a good way to practice writing. From his/her experience, he tried to use Yami word when talking with others through MSN and he felt he was familiar with some Yami words. Though the learning outcome was not measured by the tests, it was still a useful comment for promoting the site.

Grammar

Grammar was the most challenging part for the learners and they faced lots of trouble of it. All students thought the structure of Yami was complicated and hard to understand (Excerpt 11). The students tended to consult with grammar analysis of each lesson repeatedly. However, the strategy seemed not to solve their problem and they hoped the site could give them more components to aid their grammar learning.

Excerpt 11
S5: Yami 語是 ergative，跟中文英文很不像，很難以理解
The structure of Yami is ergative. It is hard to understand because it is totally different from Chinese and English.

Practices/assessments were the first consideration from students' perceptions. In the deeper exploration, the learners needed the practices which focused only one grammar point, like case marker, person, or sentence patterns. Practices also could reflect their learning strategy that repeatedly looked at grammar analysis. Besides practices, the users thought each lesson should provide assessment to let them know how much they had learned and what part of grammar they should notice it again. Otherwise, some students considered the part of grammar analysis was not so usable for them. The reasons were as following:

Excerpt 12
S4: 一看過去都是黑白的，沒有重點記號，讀過去我還是不太知道重點在哪
The part of grammar analysis is only black and white without highlight markers. I still do not know where the point is after I study it.

Excerpt 13
S7: 一課裡面的文法包含太多東西了，我覺得對初學者而言有點吃不消
The grammar analysis of one lesson contains too much content. I feel it is too hard for the beginners.

From their evaluation of the grammar part, highlight markers were asked again to be provided in the site to help students catch the grammar points. A few students expressed one concrete comment that maybe the headline and subtitle could use different colors or boldface to show the points. Next, some students thought that one lesson contained too many grammar points. They hoped that each lesson of beginning level could reduce the grammar knowledge and it would provide more time for the

learners to suck it in. In addition, other students had one more expect that the part of grammar analysis could supply links. For example, one student described that if each grammar point, like case marker, had a click button which could relate to other webpage containing all the information about case marker in beginning level, he/she felt that he/she could get a whole and more logic picture to understand the structure of Yami.

In summary, students learning difficulties were mainly focused on the aspects of pronunciation and grammar. For speaking skill, students still relied on the sound track of the site but they expected that it would have some pauses to allow them to follow and repeat it again. For grammar, the learners thought the site should increase highlight markers to remind them where the field was and decrease the grammatical content of each lesson. Practice exercises for familiarizing grammar and word meaning were focused on reading comprehension and grammar. For listening and speaking skills, the learners all hoped that the audio pace of text reading could be slowed down. For writing skill, the users suggested that the current on-line dictionary could add a function that let them insert in Chinese to look up the target Yami words.

Before commencing the research of the second stage, the website was adjusted in response to the learning needs found in the stage. First, users could listen sentence by sentence from the in-text sound track instead of the whole conversation while reading. Second, the on-line dictionary let the user insert not only Yami, but also Chinese, to look up vocabulary. Third, the homepage provided the email address of the site developers so that the operator could solve user difficulties. Finally, games for practicing the forty lessons were included. It promoted the students to review what they learned. In addition, the content of the site was proofread twice to ensure the accuracy of the sound track and materials. Through project team's hard work, the

Yami language learning center had improved tremendously and it was towards higher quality.

Results and Discussions 2:

4.2 Needs from the Native Speakers' Perceptions in the Second Stage

The second stage was separated into two parts. The first one was a quantitative study to investigate the general perceptions from three categories of site evaluation, interface (involved with layout and audio effect), content, attraction, and leaner-control. In addition, it also reported what was still lacking at the end. The qualitative research explored deeper considerations and expectations for the site, the learning difficulties, and user experiences. Through the two sections, it collected the learning needs from the six native speakers.

4.2.1 The Quantitative Investigations

a, Students' Perceptions to the Website

Interface (Layout and Audio effect)

Table 6 shows that layout and audio effect of the site receive positive feedback from the subjects. It demonstrates that most students agree that the site design is user-friendly (Item 1) and content is easy to obtain (Item 6). About 70% of them think the space of whole page was pleasing (Item 5) and the sound track demonstration is clear (Item 7).

Table 6. Percentage of agreement, neutral comment, disagreement for the site interface (layout and audio effect).

Item Per of option (%)	% of agreement	% of Neutral comment	% of disagree-ment
1. The website design is easy to operate.	87.6	20.7	1.8
5. The web pages are designed with sense of beauty and comfortable.	72.4	23.3	4.3
6. It is easy for me to find what I want in the site.	70.7	25.0	2.6
7. The sound demonstration is clear.	70.7	25.0	2.6

Note. The questionnaire was designed with likert scale from 1-5 (See appendix ?) The total subjects were 118. First, the percentage of agreement was from: (numbers of subjects who selecting 4 and 5) /116 *100% and so and forth.

Table 7. Percentage of agreement, neutral comment, disagreement for the site content.

Item Per of option (%)	% of agreement	% of Neutral comment	% of disagree-ment
2. The website content is authentic to fit the daily life in Lanyu.	80.2	18.1	1.7
3. The materials can help my language learning.	76.7	21.6	0.9
11. I think the on-line dictionary is helpful in Yami learning.	67.0	25.0	6.0
12. I can understand grammar analysis in the site.	67.3	27.6	5.2
13. I can understand the spelling symbols in the site.	65.5	29.3	4.3

The Content in the Website

For the category of site content (see Table 7), most students found the teaching

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materials fit into their daily life (Item 2) and assisted in Yami language acquirement (Item 3). Item 11, 12, and 13 show the detailed information in this division. The on-line dictionary (Item 11) received 67% support as a useful tool. About 65% of participants understood the grammar analysis section and Roman spelling system on the site. However, comparing the agreement percentage of item 11, 12, and 13 with item 2 and 3, there lies a gap around 10% between them. It has been speculated though the students considered that the content useful in their life and Yami learning, fewer of them understood the grammar and Roman spelling.

Agreement for Learner-control and Attraction

The next part investigated of learner-control of the site. Table 8 displays a 68.8% positive opinion that the practice exercises on the website fit their learning needs (Item 9). Approximate 70% (Item 8) of users felt that e-learning helped them learn the native language without time constraints. 50% learners were willing to use the site for 20 minutes per day (Item 10).

Table 8. Percentage of agreement, neutral comment, disagreement for the learner-control and attraction of the website.

Item ⟋ Per of option (%)	Per of agreement	Per of Neutral comment	Per of disagree-ment
8. I find e-learning making me learn Yami without time limit.	69.9	20.7	9.7
9. The exercises fit my learning needs.	68.9	27.6	3.5
10. I am willing to use the site over 20 minutes in learning Yami.	50.0	42.2	7.8
4. I am interesting in learning Yami after using the site.	65.5	31.0	2.6

Special attention was required to examine the discrepancy between the previous categories which gained positive support of percentages mostly over 65% or even 80%, and the finding that just 50% would use it after school. It did not symbolize a desire not to use it. During in depth discussion, it was suggested that the situation may be due to the limited access to computer equipment on Orchid Island. Not everyone owns a computer at home (Hong, 2007). Also, the junior high students do not have computer course at school. They may only have access while they go to cybercafes during the weekend. Thus, they may be unable, but not unwilling, to employ the website. Further possible reasons should be further researched to find the reasons why students hold lower desire to use it.

In an overview of the results, the layout and effect audio obtained high support, all the items were over 70%. The content on the site was recognized as helping daily life conversation and native language acquirement. It enticed over 65% of students to become interested in learning their native language (Table 6). Most items gained over 65% agreement and some of them were even over 80% support (Item 1 and 2). It indicated that the Yami language learning center obtained positive feedback from most of subjects. However, besides noticing the percentage of agreement, each item actually contained 20% to 30% of students choosing "3", "I do not have any comments about it", specifically item 10, in which 46.6% of users choose "3" (see Table 6). It represented that a certain number of the students reflected that the site was neither bad nor good. It needed additional study to determine their real thoughts on the site.

In the more detailed investigation, some items were found to have significant differences among the three grades after the analysis of Anova (Table 9). First, the third grade were more like to agree that the site is easy to operate, compared with

others students (Item 1). Second, compared with the second grade, more third grade students agreed the website content to be authentic (Item 2) and they were more willing to use it after school (Item 10). The reason for the latter one may be ascribed to the pressure to pass the test of "certification of indigenous language" (族語認證) in order to get the 35% bonus points on the Basic Competence Test of Junior High students. The certification and test are closely associated with their future career and livelihood. In the test, they need to possess not only good listening and speaking skills, but also be able to read and write Yami with the Roman spelling system. In addition, there is no reference book or range for them to prepare for it, so the site resources could be a solution for them. Additionally, the on-line dictionary was considered more helpful for the students from second and third grade than the first grade.

Table 9. Anova of comparing the degree of agreement with three grades among the items.

Item / Per of option (%)	Means	P	D
1. The website design is easy to operate.	4.121	.000*	$1^{st} < 3^{rd}$, $2^{nd} < 3^{rd}$
2. The website content is authentic to fit the daily life in Lanyu.	4.112	.015*	$2^{nd} < 3^{rd}$
10. I am willing to use the site over 20 minutes in learning Yami.	3.569	.018*	$2^{nd} < 3^{rd}$
11. I think the on-line dictionary is helpful in Yami learning.	3.931	.001*	$1^{st} < 2^{nd}$, $1^{st} < 3^{rd}$

P < .05*

Note. 1st, 2nd, and 3rd stand for the first, second, and third grade.

b. Needs Analysis from Quantitative study

The other part of the questionnaire is productive in finding the needs from the subjects. The statement states "I think the site could be improved from these directions" and it equips 12 options for them to choose multiple choices. Table 11 presents that adding animation (Option 3), films (Option 4), and pictures (Option 5) significantly set apart from other options. It indicated that the three needs were found to be the most necessary elements for inclusion in the site. Short (1998) referred that though teens could deal with abstract thinking, they still demand visual stimulation to attract their attention. No wonder these three options were put stressed by the junior high students.

Table 11. The ranking of the learning needs in the website

Options	Sum	Means	P	D
1. Design of webpage	25	.216		
2. Typeface	26	.224		
3. Add animations	80	.690		
4. Add films	76	.655		
5. Add pictures	63	.543		
6. Add chatroom	31	.270		
7 Add highlight markers	22	.190		3, 4, & 5 >
8. Add extended information	13	.112	.000*	1, 2, 6, 7, 8, 9, 10, 11, & 12
9. Add assessment	20	.172		
10. Add test items of native language certification	28	.241		
11. Add related website connections	21	.181		
12. Add search function	26	.224		

P < .05*

Some options should be also taken consideration, either. Option 6 "Adding chat

room" was also important for the students. It may be traced to the website of Lanyu junior high school (http://www.layjh.ttct.edu.tw/). Each class had its own homepage included in the functions of forum and message board for them. Students were used to leave the messages or sharing their feelings on it. According to their habit, they may need chatroom in the site. Then, Option 10 "Adding the test questions for certification of native language" was another wish of the students. The reason had mentioned in the previous statement that they had tension to pass the test. Recently, the website increases examination questions and the project member, Jasmine, is paying her effort to make them more interesting by the Captivate software.

In the quantitative study, the Yami language learning center was evaluated by the 116 students at Lanyu junior high school and appreciated by most of them. Especially, the students from either the third grade or Iraralay village had higher agreement on the content and function in the site and were more willing to employ it than other students. In addition, animations, films, and pictures were the most necessary elements that the students wished to further developed on the site.

This part had two valuable functions. First, we did not have many chances to investigate the overall perceptions of the native speakers. Through the questionnaires, the efforts of the project team gained support. It showed that they were working in the right direction. Second, it exhibited the users who were really interested in the site. Future work and research could put more emphasis on their opinions and input. However, the results were too rough and did not clearly point out the direction how the project team could improve the site. It required deeper exploration. The next section presents the qualitative research which discusses the more detailed perceptions of the five participants.

4.2.2 The Qualitative Exploration

This section has been separated into three categories to discuss students' learning needs. At the beginning, it detected learners' expectations for the site. The second part collected the needs stemming from their learning difficulties. Finally, the needs analysis was conducted through their experience of the website. By interviewing the five native speakers, the similar and different learning needs were collected in the first stage.

a. Learners' Expectations for the Site

This part talked about participants' expectations "What do you expect to learn (Yami) after school?" and "What are your expectations before you enter the site?" The five participants were required to take the course of native language for one hour every week. It seemed not enough for their Yami learning.

Table 12. Expectations for the participants after school and for the site.

	Expectations for the continuous Yami learning after the course	**Expectations before using the site**
S1	Speak Yami with the teacher.	More practices in speaking
S2	Learn to speak Yami with family and hold Yami song competition.	More advanced Yami language learning, e.g. culture information or **tales**.
S3	Learn the Yami **tales** and stories, hold competition of Yami language proficiency, and speak Yami with the classmates	More practice for listening and reading about the old **tales** and stories.
S4	Practice questions of the test in getting certification of Yami language	Database of test questions in getting certification of Yami language.
S5	Use website to practice speaking Yami.	Maybe listen to the old **tales**.

Table 12 demonstrates what and how they wanted to learn Yami after the course and the expectations for the site. Most of the students (besides S4) would like to focus on speaking skill after school with family, teacher, classmate, and website. It was a special phenomenon. The people from other places believed that these native speakers should have sufficient language exposure to speak Yami on Orchid Island but the locals did not think so. It could be attributed to the fact that they lived in the dormitory at school and they often talked to each other in Chinese from Monday to Friday. They may have opportunities to speak Yami with their family on the weekend. Otherwise, S2 and S3 hoped to hold competition about Yami songs or language proficiency after the course.

From their description, it was obvious that most of the participants needed to practice speaking after school. Also old tales were viewed as an important element that should appear in the website to fit their learning needs. The problem has had the answer in the materials of the third and fourth volume. The students may find it later when using it.

b. Needs Analysis from Learning Difficulties

The area delivered students' learning difficulties and the strategies. Grammar was excluded because they did not learn it. Generally, they thought listening and speaking were much easier than reading and writing. Moreover, the participants would state how they would use the site as strategies in overcoming the difficulties. It was one of the parts in evaluating if the existed content and function were effective in assisting language learning. Also it would reveal what were still lacking in the site as the learning needs.

Listening and Speaking

Generally, none of the students had any problem in listening and speaking. Table 13 presented the detailed information that the students sometimes had problem of the vocabulary. S2 and S3 tended to overcome it by asking parents. S1 sometimes used Chinese as strategy when he faced the Yami words that he did not understand. S4 was confident that she was good at listening and speaking.

Table 13. Students' listening and speaking difficulties and their strategies.

	Listening and speaking difficulties	Strategies
S1	Do not understand some **words** and sometimes forget how to speak them.	Use Chinese instead of the Yami word.
S2	No difficulty. But have problem for the unfamiliar **words.**	Ask the parents and memorize it immediately.
S3	Do not understand some sentences or **words**. Can not pronounce the words correctly sometimes.	Ask father and more practice in pronunciation.
S4	No difficulty.	No strategies.
S5	Sometimes cannot understand teachers' Yami speech, esp. for the **words**.	Ask the teacher.

Among these participants, it could be inspected their divergence of Yami proficiency because they had different amount of language exposure. First, S1 only spoke Yami with grandfather and grandmother when they got together. S2 and S3 would produce Yami with their parents and company in the same village when they came home on the weekend. S4 often talked with her friend, classmates, and family in Yami. It meant that she would use her native language everyday. Chinese was the main language for S5 because she did not speak Yami at home and school. Therefore, Yami language learning center could assist the students in creating more input for listening and let them practice speaking. It should note that the specific exercises of vocabulary were

chiefly demanded from the learning difficulties.

Most students pointed out the sound track of text reading could aid them perceiving more listening input and the section of Demonstrate let them practice speaking Yami. However, these functions did not satisfy them. Some students thought that though the content of demonstrate was profitable to provide lots of chances for speaking Yami, some words were quite difficult for them that they may not understand or pronounce (Excerpt 14 and 15).

Excerpt 14
S3: 比較進階的(課程)，很多字都看不懂…我會想要聽更多
I can not understand the words in the more advanced lessons…I would like to listen to more about it.

Excerpt 15
S2: 示範活動裡面可以練習很多東西，可是有一些字不太熟，如果也有聲音示範跟單字解釋會更好
I can practice a lot in the section of Demonstrate but I am not familiar with some words. If it could add sound track and word explanation, it would be better.

Vocabulary learning was stressed again. Some students hoped the site could add pictures and animations for remembering the words and some expected that it would design dictation exercises to rehearse vocabulary (Excerpt 16).

Excerpt 16
S3: 希望網站會有聽寫的練習，像是先有聲音，然後可以打字，然後出現字…比較幫助學習
I hope the site could provide dictation exercises. For example, it firstly provides sound and then let me type the word; finally, the correct word appears…I thing it is more helpful for learning like that.

In addition, S4 had a surprising suggestion that the site should supply different

pronunciations of the six villages. Thus, she could understand all of them in the test of gaining certification for native language. Her request is answered in the section of "Yami corpus" in Digital archiving Yami language Documentation website (http://yamiproject.cs.pu.edu.tw/yami/yami_corpus.htm) which contains plenty corpora from each villages for various topics.

Reading and Writing

Comparing with listening and speaking, the participants had greater problem in reading and writing. The cause of the situation was supposed that they seldom used the two Yami skills in the daily life and classroom. Spelling was the common learning difficulty for all of them (Table 14).

Table 14. Students' reading and writing difficulties and their strategies.

	Reading and Writing difficulties	Strategies
S1	R: Can not understand some sentences. W: Have difficulty in **spelling**.	→ Look up the textbook → Spell each syllable and then spell out the word.
S2	W: Can not **spell** some words	→ Ask the teacher
S3	R: Can not understand some words. W: Can not **spell**	→Ask the companies in the village →Look up teacher's handout
S4	R: Can not understand part of the text W: Have problem of **spelling**.	→ Continue to read until s/he understands it. → Depend on the previous experience to spell it.
S5	W: Can not **spell** some words.	→Ask parents

The strategies were including in asking parents and teachers or consulting with the textbook or handout. In fact, the learners strongly depend on Mandarin phonetic symbols when facing Roman spelling system. The reason could be traced that they

were taught Yami with it from the textbook and teacher. It could be inferred that they had problem in spelling since they may not be well versed in Roman spelling system. As the result, it was not surprising that the participants would hope the site could increase Chinese phonetic symbols to favor their reading.

Otherwise, they uttered that though the on-line dictionary and text reading indeed provided lots of input for reading and writing, they still yearned for more exercises for them (Excerpt 17).

Excerpt 17
S1: 自己的拼字真的很不好，上課也很少寫，所以…就是很希望有拼字練習
I am not good at spelling Yami words and there are few chances for me to practice. Therefore, I expect it can supply spelling exercise in the site.

This section found that Yami vocabulary and spelling posed the greatest learning difficulties of all language skills. For listening and speaking, the majority part of students would speak Yami for two days during the weekend. They may have had daily conversations with each other but there were not many chances for them to obtain more vocabulary. As for reading and writing, they opportunities for practice at home or school were rare, so they were not familiar with spelling Yami words. In addition, they relied on Chinese phonetic symbols to assist spelling. Through these findings, some learning needs were produced for the site. The participants expected that the website could design on area which introduced vocabulary with pictures. Exercises for spelling were heavily anticipated for inclusion in the site, for example, dictation and typing games.

c. Exploring Needs from the Using Experience

The section was separated two aspects. The first one was the evaluation of

content, attraction, and interface for the site. The other was students' using experience for each section, including in text reading, grammar analysis, activities and demonstration, exercise, on-line dictionary, and games. Through real operation with the internet resources, it implied which advantages of the site could effectively assist students' language acquirement. Similarly, it indicated the deficiencies that existed and provided targets to perfect the site.

Overall Evaluation of the Website

In the dimension of the website content, it focused on authenticity if the teaching materials related to their real life and could be applied in the society. Four students, besides S5, consistently agreed that they would use these sentences. S2 and S3 expressed that they would use the sentences in the topic of greetings (1st lesson of the 1st volume) and buying vegetables (9th lesson of the 3rd volume). S1 considered that text reading was excellent that he just used the dialogue with his grandfather last week (Excerpt 18).

Excerpt 18
S1: 有用到(指著課文閱讀的對話)，像是上個禮拜我去遠足…也有回家跟祖父講話，就講到山與海 (第一冊第 10 課)
I will use them (pointed to the conversation in the text reading). For example, I hiked last week and I talked to my grandfather with the topic of mountain and sea (10th lesson of the 1st volume).

Although the teaching materials were authentic and related to their daily life, it did not attract them to browse the site. Only S3 believed that he would sometimes use the on-line dictionary when he felt bored. Other students had different opposite comments and suggestions in promoting attraction. S1 listed old tales that should be included in. S2, S3, and S4 delivered their preference that it should be joined more

pictures and films.

Next one was interface involving with layout and audio effect. The first question "Do you think the layout is comfortable and beautiful?" was received positive and negative responses. Only S3 thought each webpage was consistent, so it made him feel comfortable when using it. S2 and S4 implied it was passable but they felt the whole page were full of words. S1 and S5 thought the layout was monotonous because of lacking pictures (Excerpt 19).

Excerpt 19
S5: (網頁)都只有字,看起來很無聊…又密密麻麻的…多點圖片比較好…網站也可以用久一點
The web pages are full of words and make me feel boring. The arrangement of the words is very dense. It is better to increase pictures so that I could use the site for longer time.

Actually, all of them not only unanimously agreed that the words were too plenty and pictures were so rare in the site but also had opinion for the typeface. Some students described that all words with the same color made the content unreadable (Excerpt 20).

Excerpt 20
S2: 字體顏色要有區別…因爲看一看容易黏在一起…有點模糊
The words should be discriminated with different typeface and color or I will feel they are stuck together and make me feel blurred.

For the audio effect, it also gained different reactions. S2 and S3 referred that the sound track could be fluently played and it was very clear. Nevertheless, S4 uttered that the volume of the sound track would sometimes too loud or not. She also conveyed a special idea that the sound of the persons in sound demonstration was not

appropriate (Excerpt 21). S5 reported that the speed of sound was too fast so that she must listen to it for at least two times. It had mentioned that she was not so good at listening and speaking Yami, so she needed the audio effect which could be slowed down by her.

Excerpt 21
S4: 裡面的聲音應該要年輕一點…不然沒有什麼朝氣，聽一聽就不想聽了
The sound in the audio effect should become more youthful, otherwise, it will lack vigor and makes me unwilling to listen to it.

Evaluation from Each Function in the Website

In this area, some opinions were still stressed, like adding picture and distinguishing colors and typefaces of the words, would be neglected to avoid the repeated description and all the qualitative results would be put in order in the following section of summary.

First, some students hoped that text reading could contain related pictures to provide the meaningful context. Second, grammar analysis may be not so functional for them but they stated that it was too complicated. S5 expected the grammar explanation to be simpler and more vernacular and S4 hoped that it should have highlight marks so that she could catch the keys quickly (Excerpt 22). S1 proposed a concrete recommendation that the description and examples could be edited with different colors (Excerpt 23).

Excerpt 23
S4: (文法解析)看過去都沒有重點，會不想看耶…講重點就好啦…標示一下也可以…這樣子我看過去就知道它在講什麼
It looks like the grammar analysis does not have any focal point and it makes me unwilling to read it. Say the keys or mark the focal points and I could quickly study it to catch the grammar points.

Excerpt 23

S1: 如果文法的字跟句子顏色不一樣會比較好讀…還有那個…那個例句…如果母語的顏色(跟中文翻譯)不一樣會比較好

If the description and example of grammar analysis could be separate with different colors, it will be easier to read through it. Also for the example sentences, if the native language could use different color with the Chinese translation, it will be better.

The third evaluation was learning activity and its demonstration. All the students exhibited their interest on it because it extended lots of sentence patterns to assist their speaking. S1 again offered a notion that it should add sound track in the demonstration section (Excerpt 24). As to exercise after home, most students voiced that their teacher could utilize these tasks as assignments, it would be more attractive for them. S5 considered that only listing the task was not enough and difficult for her to accomplish them. If it could cater some hints, it would enhance her motivation in doing it.

Excerpt 24

S1: (示範活動)很好，不過有一些不太會唸…要有聲音示範比較好

Demonstration for activities is good but I can not speak/read some content. It would be better if it supplies sound track.

The on-line dictionary was widely appreciated by every user. In the previous description, they were not clever with Roman spelling. In this function, students did not feel troublesome to find the target word. For example, if he wanted to look up the vocabulary of "kaminan (aunt)", he only could type "ka" or "kami" and then he could get it from the list. It was very convenient for them that they needed not to spell out the word correctly in the on-line dictionary. Moreover, games in practicing Yami were gained great praises. The students expressed "I love the games." S3 said that he liked to learn from playing games. It could be boldly supposed that on-line dictionary and

games were the efficient instruments to support and motivate students in learning Yami.

Summative Evaluation for the Website

The final part the summarized evaluation to ask the participants the questions "Do you think the website is helpful for your Yami acquisition?" S2 considered that the dictionary did aid him to look up the words that he did not understand. Text reading and games were beneficial for S3 (Excerpt 25). S4 got the sense of achievements through the materials of beginning level. In addition, the site embraced another significant meaning for the native speakers. Some of them stated that they may operate the site if there was no course of native language (Excerpt 26).

Excerpt 25
S3: 課文很好，我大概聽完就會說了…遊戲也很不錯
Text reading is good for my speaking after listening to it. Games are also not bad.

Excerpt 26
S1: 目前(網站)沒有幫助，不過以後沒有族語課可能就要利用網站來複習母語…
也有可能，以後我到台灣工作了，我怕我會忘記母語…就會來一下這個網站
I think the website was not helpful. However, I would use the site to review native language, if there is no course of native language. Or it is possible that I will go to work in Taiwan. I am afraid that I will forget my native language, so I will enter the site for a while.

S1 pointed out the reality that every young man on Orchid Island would like to earn a job in Taiwan (http://www.layjh.ttct.edu.tw/). Therefore, Yami language learning center was very valuable for them to remember their own native language even if they were in foreign land.

d. Summary

    In the qualitative explorations, it articulated learning from three aspects. First, students stated that they would like speak more Yami after school and expectations before they entered that site were stated. The learning needs had been solved in the third and fourth volumes' teaching materials. Second, word meaning and spelling were the consistent learning difficulty out of all language skills. For detailed information, they generally did not have problem with listening and speaking but they cared about some unfamiliar words. The sound track for in text reading could help them overcome it gradually. Reading and writing were considered more complicated than the other two skills because they seldom used them in daily life and at school. They often felt frustrated with spelling. Also, they heavily depended on Chinese phonetic symbols to study Yami. Therefore, two learning tools were created. One was to add Chinese phonetic notations to assist their learning. The other was to supplement the section on vocabulary introduction with pictures and exercise for spelling, such as dictation. Finally, more learning needs were revealed during the section detailing user experiences on the site. They expressed that the teaching materials were authentic and applied to real life on Orchid Island. However, this did not increase interest in students to use it or promote their motivation in learning Yami. This may be related to the interface. All of them thought the layout was boring because the words were too plentiful and pictures were absent. In addition, it was suggested that the words should use different typeface and colors to make the webpage more appealing. Moreover, it could augment the context associated with the text by including pictures. The description of grammar analysis should simplified and the points. Perhaps the Yami sentences and Chinese translation could be separated by diverse colors. The activity and its demonstration should coordinate with the text reading to attach sound tracks so that the users could listen and learn how to speak.

Exercises after finishing the internet resources need to supply some appropriate hints to them; thus, they would have higher inspiration to accomplish it. Otherwise, the on-line dictionary and games were praised by all the participants. The former one facilitated their vocabulary acquisition and the latter one fit their preference. Overview of their evaluation indicates that their responses comprised both positive and negative sides but, regardless, the existence of the Yami language learning center was meaningful for the native speakers. By operating the website, they would never forget their own language, even if they stayed in or worked in a foreign land.

Results and Discussions 3:

4.3 Deeper Investigations for the Learning Needs in the Third Stage

Before conducting this stage, the project team had constantly revised the website. It added the new section of "Spectrogram" that made the Yami learners understand the accent for each word. It also supplied sound tracks for vocabulary and sentences.

In the third stage, it divided the website into two roles. The first part viewed the site as assisting Yami language class. It conducted five interviews to investigate the learning needs in two directions, the learning difficulties and strategies combined with evaluation from the user experience of four students. The second was needs analysis from the aspect of previewing the lessons. It was particular that the previous two stages focused on using the site for reviewing. Preview was also one part of classroom learning, so it should included in the study. From this data, a more detailed evaluation and learning needs agenda for the site were discovered. Because the background of participants was similar to the first stage, it would yield resembling learning needs.

These opinions may lead to more needs emerging for application in developing the site in order to aid their achievement in learning Yami. However, it revealed some unique ideas that were also valuable in perfecting the site.

4.3.1 Using the Website as Assisting Classroom Language Learning

The four participants in the section were graduate students from linguistic group. Two of them (S1 and S2) firstly took the course. Their motivation of S1 was pure that he would like to understand why more scholars were eager in Autronesian languages (Excerpt 27). S2 was curious about Yami language and wanted to learn its basic conversation (Excerpt 28). The other two students who were also the project team members had attended the class in last semester. Also they had finished all the materials of the four volumes. The motivation that they came back the course was to do the research about it. All of them did not have any expectations for Yami language center, so the result and discussion would starte from their learning difficulties and strategies.

Excerpt 27
S1: 就是蠻好奇為什麼越來越多學者在研究南島語，想要了解一下南島語大概是長什麼樣子…另外，因為何德華老師是這個方面的權威，所以就選這門課了
I am curious why more and more scholars study Austronesian languages, so I want to understand the overall structure of it. Otherwise, I took the course because Dr. Rau was the authority in the domain.

Excerpt 28
S2: 這門課可以學到一個全新的語言…而且我想要挑戰看看可不可以學起來這個沒有文字的語言(雅美語)…大概是學簡單的對話跟結構的初步了解
I can learn a whole new language from the course and I would like to challenge to learn Yami that did not own its own spelling system. I want to learn the basic conversation and structure of the language.

a. *Needs Analysis from Learning Difficulties and Strategies*

This area will discuss learning from listening, speaking, and grammar. The language skills which have been excluded are reading and writing. Students rarely expressed feelings of difficulty towards them, but they will be included in the grammar section.

Listening

For listening skill, S1 and S2 felt longer word and sentence were hard, and S3 and S4 did not have problem of it. S1 were frustrated in hearing the words over three syllables (Excerpt 29). His strategy was to write down the vocabulary and separate it into several syllables and then listen to the teacher's pronunciation one more time. After the course, he would employ the sound track in the site to familiarize the pronunciation. However, he thought that the sound demonstration was too fast. He hope it could be slowed down or let the user to control the speed of playing the audio. He still not conquered the difficulty at the end of the research.

Excerpt 29
S1: 太長的字會聽不清楚，就是音節太多的字…大概超過 3.4 個的…還有一些音會連在一起，聽不太清楚，像是"viniay"(牲禮,肉類)，就很難聽得懂
I can not listen to long words or words with too many syllables over three or four. In addition, some words were stuck together, like "viniay" (domestic animal, sacrificial offering). It was really hard for me to listen to.

S2 thought longer sentence was the barrier for receiving the Yami input. For example, the sentence, "ya apira o kakteh mo?" (How many brothers and sisters do you have?), was complicated for her. She may only catch the words "ya apira o" and "kakteh mo" would be missing in her brain. When facing the condition, she tended to note Chinese phonetic notation beside the sentence. She would also enter the site to

hear the sound track. Similarly, she described that people speak too fast in it, so she needed to repeatedly listen to the same sentence for several times (Excerpt 30). It was cheerful that she quickly overcome the puzzle of hearing longer sentence until learning lesson four. Otherwise, S3 and S4, they were more acquainted for Yami language, so they do not have trouble in listening.

Excerpt 30
S2: 網站上面有句子的聲音檔,可是都唸得太快了...有時候覺得快得字跟聲音我都配不太起來
There was sound track in the site but it was too fast. Sometimes I feel it was too fast that I can not match the text and the sound demonstration.

From the statement, the beginners had the trouble in listening long Yami vocabulary and sentences. It simultaneously presented the same learning needs with the first stage. Though the students could listen to specific sentences, people spoke Yami too fast in the sound track. Brown (2001) indicated the teaching principle that clear and appropriately slow articulation was required for the language beginners. Krashen (1982) referred that students had to primary comprehend the input and then to produce the language output, so adjusting the speed of audio playing may be significant. Thus, it could elaborate its function that assisted students' to receive the Yami word and sentence.

Speaking

Analysis of the data detected a clear separation between the speaking difficulties of the four students. S1 and S2 regarded pronunciation as their learning difficulty. For example, the syllable of "ag" and "cia" would obstruct S1's pronunciation and S2 confused recognition of [ku] and [hu] with the word "ko" (Excerpt 31). S3 and S4

focused too intently on the correct grammar usage, sometimes causing a barrier in their language production (Excerpt 32).

Excerpt 31

S2: 有一些字我都會被英文影響到，都發的不對，像是"ko"，應該要發[ku]，可是我都會不小心發成[hu]

I will pronounce some words incorrectly that is influenced by English. For example, "ko" should pronounce [ku] in Yami but I always speak [hu] forgetfully.

Excerpt 32

S3: 老師雖然說我(雅美語)講的不錯，可是有時候還是會有錯誤，因為有(說)時候都會在想文法(詞序)前後的問題

The teacher praise me speaking well in Yami but I some make mistakes. Sometimes I will think word order before I product the language output.

In addition, S1 would be confused by the word meaning when speaking Yami. He expressed that he could not clearly differentiate the Yami word of "kaka a mehakay, kaka a mavakes" (older brother and sister) with "wari a mehakay, wari a mavakes" (younger brother and sister). These words are greatly diverse from English. It was specified in the first stage that when learning Yami, students would be affected by English because they all used Roman spelling as a writing system. In this stage, the students referred to the sound track of the site after the course. However, they judged that it was not sufficient (Excerpt 33 and 34).

Excerpt 33

S2: 聲音示範除了速度比較快之外，有些人講的聲音會很小，就不是很清楚…(研究者隨意點了幾個聲音檔)…她(董老師)的聲音是最清楚的

Beside the quick pace of the sound track, the volume of some demonstration was too low and I can not hear it clearly. (The researcher clicked some sound track at random.) Her voice (Teacher Dong) is the most clear.

Excerpt 34

S1: 網站上面文法交代的很清楚…可是都沒有單字介紹，練習發音(單字)的機會也不多

The site has clear grammar explanation but there is no introduction of vocabulary. I have few chances to practice the pronunciation of each word.

Moreover, the students expressed that understanding Yami phonology was important for them but they did not know the site provided solutions for the problems in the "Grammar" section on the site. Next, they worked laboriously in pronunciation or differentiating similar sounds and hoped the site could embrace more opportunities for rehearing articulation. It was not surprising that they put stresse on it. Brown (2001) remarked that pronunciation was key to gaining full communicative competence. However, the sound track of the dictionary and spectrogram are available for them to focus on training articulation for vocabulary, yet students do not know where to reach it. They only started to become aware of the spectrogram through the researcher's reminding. This may be the time for the site developers to ponder how to make the language learners more easily find features in the existing source that are tailored for thier learning difficulty. It suggests that the website homepage could have a brief guidance to display how to navigate the site and acquire specific information about Yami.

Grammar

Grammar was still an enigma for Yami language learners. The two beginners felt exhausted by it. Even the other two students, who had finished the materials in the four volumes were still frustrated by it. The main problems they met were word order or sentence structure, case marking, and personal pronouns. S1 constructed a sentence that was totally wrong in its order (Excerpt 35). He generally understood the basic word order in Yami, like verb + object + nominative marker. S2 considered personal

pronouns complicated in lesson two and then the case markers in lesson five. The strategies they used consisted of listening to Dr. Rau's instruction in class, consulting the book of grammar analysis, and repeatedly practicing it through the on-line games. Nevertheless, both learners had not been able to conquere the grammar puzzle in Yami at the end of the study.

Excerpt 35
S1: 我會用英文或是中文來想(句子結構)，我要造一個句子是"我妹妹在台中工作"，所以我就依照這個意思，寫 "si wari a kavakes + do 台中 + ya mivazay"(我妹妹+在台中+工作)，可是，它的結構卻不是這樣
(正確答案應該是 "si (主格標記) + wari a kavekes am (助詞), ya(指示詞) + mivazay + do(處格) 台中" 我妹妹+工作+在台中)
I will think about sentence structure with Chinese and English. For example, I want to make a sentence "My younger sister works in Taichung." I do the literal translation depend on it such as "si wari a kavakes + do Taichung + ya mivazay"(我妹妹+在台中+工作). However, the structure was totally not like that.
(The answer is "si (nominative marker) + wari a kavekes am (topic marker), ya(deictic) + mivazay + do(locative marker) Taichung" My younger sister + in Taichung + works).

S4 was also confused with "ya" (auxiliary verb) and "a" (linker), case markers "so" and "si", and word order. He tended to correct the incorrect grammar by listening to teachers' demonstration and then recalling it. S3 encountered the same condition. Her strategy was to become familiarized with it through oral practice. They also utilized games to enhance learning. However, S3 judged that she could do well in the on-line games by guessing or analogy but she could not speak or write down a whole sentence. It was observed that though S3 and S4 were more proficient than S1 and S2, the barrier of grammar had influenced their Yami achievement so far. Yami grammar was indeed the main learning difficulty from the first and third stage.

Moreover, not only did the participants expressed the learning difficulties in

Yami grammar but also I found they had the similar problems in the oral test recordings. In the test, they often confused the deictics "o ya", "o ri", and "o ito." Also, they made mistakes in sentence structure, especially the pattern "ya apira o kakteh mo?" "How many brothers and sisters do you have?" It showed that was grammar indeed the most difficult part in learning Yami and the website should provide students with more specific practices in order to master it.

Additionally, the learning difficulties and needs of students strongly depended on the sound track to enhance their listening skill. However, the speed of it was so fast that students could not utilize it effectively. It became apparent that an adjustment was in order to fit their learning needs. Second, students were troubled in pronunciation by speaking Yami but the problem could be solved with the on-line dictionary or spectrogram which provided sound tracks of vocabulary. From the discussion, it revealed a situation in which the sources of the site had already been in existence but the users did not comprehend it. It indicated that the site arrangement may not be appropriate to maximize its effectiveness. Finally, grammar was the greatest puzzle for learning Yami. Students studied it through a grammar book and game practices but all of the participants still were unable to master it. This information was a valuable tool for pondering the set-up of the site.

b. Needs Analysis from the Using Experience

The students' using experience would be isolated into text reading and learning games because they held more opinions about them. Other functions would be discussed in the final part, other suggestions. It exposed some covered learning needs in the first stage and some varied comments for the site.

Text Reading

The most outstanding feature of text reading was the sound demonstration with real native speaker. It heavily played the role of furnishing Yami input to the learners after the course. However, students had to deal with some technical problem at home. Varied speed of internet caused audio effect to lag that the content would be cut. Then, the user had to click it again to hear the complete sentence. S1 and S2 were used to download all the sound files in one time. It made them able to choose hearing the whole text reading or specific sentences (Excerpt 36). S2 hoped that it could prepare the sound track of whole text (Excerpt 37). It was really interesting that the condition was reversed in the first stage that the students preferred the sound of separated sentences. It suggested that since the site database had already possessed the sound track of whole text and sentences, why not put both of them in the section!? It was beneficial to fit different individual learning strategies.

Excerpt 36
S1: 先把全部存下就變成整篇的,可以先聽整篇的,再去分開聽不熟的句子
I firstly download all the sound track of each sentence to become whole text. I can listen to the whole text and then choose the sentence which I am not familiar.

Excerpt 37
S2: 希望能有整篇的(聲音檔)可以聽,可是一句一句的也需要…就是…一句一句的可以用來練習,整篇的可以知道語感
I expect that it could provide the sound track of whole text reading but I also need the ones of specific sentences. The former one could cultivate me getting the overall picture of the content and the latter can be applied in practice.

S3 underwent two versions of the sound track. She felt that the present one was inconvenient. It would appear a new window and cover the original one with text. It would bother her that she could not read the words and listen to the demonstration

simultaneously. She preferred the previous design to play the sound track in the on the top of the left corner in the same window (see Figure 8).

(sound track for whole text reading)
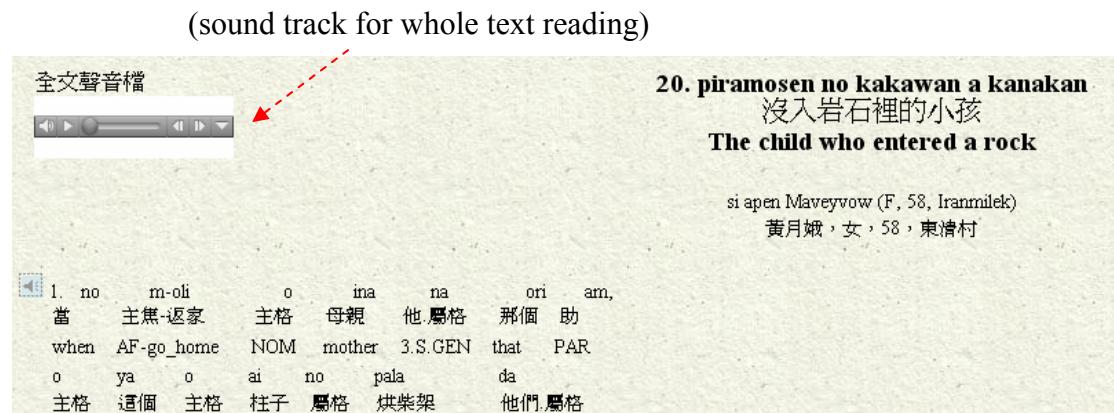
Figure 8. The image of students' need for sound track.

Note. The original version in Yami language center had reversed, so the study used the webpage of Digital archiving Yami language documentation as the example.

Learning Games

Games practice was the anticipation from the learning needs in the first stage. The students in the third period believed that it could help them understand certain grammar rules. However, it searched some arguments for it. First, the numbers of the options was not appropriate. The condition was illustrated in Excerpt 38 that S2 assumed the game for lesson two had a mistake. In fact, there was not any mistake for the game.

Except 38:
S2: 我發現第二課的遊戲有錯誤耶…就是第五題,答案應該是處格"do",可是我沒看到有這個選項…哈哈哈,原來這邊有一個滾輪可以往下拉,答案在下面(Appendix 14 有圖片可參考)
I found the there was one mistake for the game lesson two. It was the fifth question. The answer should be the locative marker "do" but I could not find the right option…Hahaha…Here is a bottom that could be rolled down to see other options and the answer was below it. (Appendix 14 provides the picture for the narrative.)

Why S2 had such illusion? The answer was that all the stems in lesson two contained nine options. Brown (2004) suggested that the quantity of options in the multiple choices should range form three to five. He also stated that too many distractors in a question would reduce its degree of discrimination. In addition, it observed that the part questions in lesson five only contained two options. It may cause students to guess the answer and lose the meaning of testing what they learned. It implied that the numbers of options for some stems should be modified into appropriate standard.

The second issue was the validity of the game content. It symbolized that the students thought the game content was not consistent with what they learned in the class. S3 detected that one of the stem in lesson one was beyond the scope. She denoted that "wari ciong" (Hello, younger sibling.) was the content of lesson two but it emerged in the game of lesson one. S2 mentioned that she felt surprising the matching game of the final question in lesson one (see Appendix 15). She remembered that she did not learn all of the words in the stem, so she was forced to guess in order to finish the exercise. It was the better situation that the test stems had no "surprise" for the learners. It meant that the content of game and classroom instruction should be consistent in order to fit the validity. In addition, students felt the games seemed not sufficient with assisting the classroom learning. They reflected that the games were mainly stressed on grammar. However, the activity they conducted in the class consisted of sentence patterns and its conversation, and grammar. The context made students call for more types of games. For example, S1 preferred word meaning quiz and S2 would like to acquaint more in sentence patterns.

Otherwise, the games in the site recently may more suitable for applying in assisting classroom learning. It had to track to the devising steps of the game designer. She attended every class to catch the grammar points from it. In fact, the content between the course and the site was a little bit diverse. For example, the self-study

student may not know "o ito" (the farthest) in the game lesson two because the site only equipped with "jito" (farther) in grammar analysis. The condition was not so serious but it should not be neglected because self-study was one of the targets in designing the site. Therefore, it recommended that the website could be updated more often to let every user synchronically perceive the latest materials.

Finally, part of the stem in the game was ambiguous. It meant that students misunderstand the stem and then relatively had a wrong selection. The most explicit example occurred in lesson three that trained them in using "o ri" (far), "o ya" (near), and "o ito" (the farthest). All the participants were incorrect for the fourth and sixth questions. Figure 9 showed the picture in the stem.
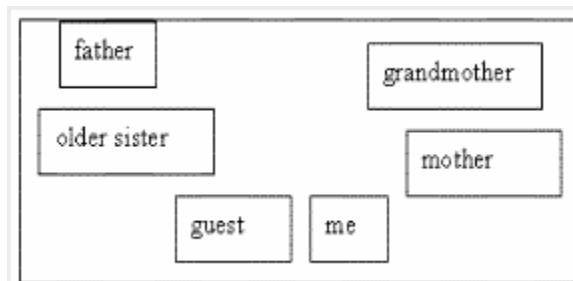
Figure 9. Picture of the sixth question in the game of lesson three.

They all thought "grandmother" was not the farthest and "farther" was. However, the real answer was opposite to their concept. The reason may be due to the game designer and the user had diverse cognition about the picture. Since all of the learners had the doubt of the location of "father" and "grandmother", it may need some revision in order to avoid the ambiguity.

Other Suggestions for the Site

The condition was the same that all the students were likely to review grammar and sentences of demonstration with handout instead of internet sources. The

explanation was similar with the first stage that they could master the learning to highlight the key word or sentence. Schmidt (1995) proposed "noticing hypothesis" that conscious attention is necessary condition for language learning. Corbeil (2007) referred that textual enhancement could be achieved by typography such as highlighting, underling, and italics letters in order to help students "notice" grammatical forms. Depending on the need, the project team has started to improve the edition of grammar analysis. Recently, in the first and second volume materials, all Yami words in grammar descriptions and examples become blue that is diverse from the black Chinese words (see Figure 10). The students describes blue is an appropriate color making them comfortable and successfully differentiate Chinese and Yami text. S4 thinks that the change is fit his strategy that he can easily look at the Yami sentence and than receive the part of the grammar explanation. S2 expressed the revised version of grammar analysis let her be able to stay the section for longer time in reading it.


Figure 10. Revised version of the grammar analysis section.

Note. The Yami words and sentences are blue and Chinese description maintains the color of black.

Moreover, S1 stated that if the section of Demonstrate could add sound track, it

was so excellent for reviewing what he had learned in the class. It suggested that the project could employ the available resources. For example, the complete video recordings in every Yami class involved in the similar materials could be provided as sound demonstration in the section.

Besides, they held one more comment on the on-line dictionary (Excerpt 39). In fact, not only S3 faced the problem. It would be more effective that the dictionary could have different search type for partial or full word.

Except 39

S3: 就是我昨天試著想要查閱"ya"這個字，結果跑出來一推有字…就是字裡面有"ya"這個音節的都會跑出來，這樣子我還要花時間去找…如果可以像典藏網那樣子的比較好(可查詢部分字或是全字,可參考 Figure 11)

I tried to look up the word "ya" but the searching result revealed lots of vocabulary that contained the syllable of "ya." Thus, I have to take time to find the target word. If the on-line dictionary could be like the digital archiving in the Digital archiving Yami language documentation, it would be better. ((It could search for partial or full word or text and see Figure 11).
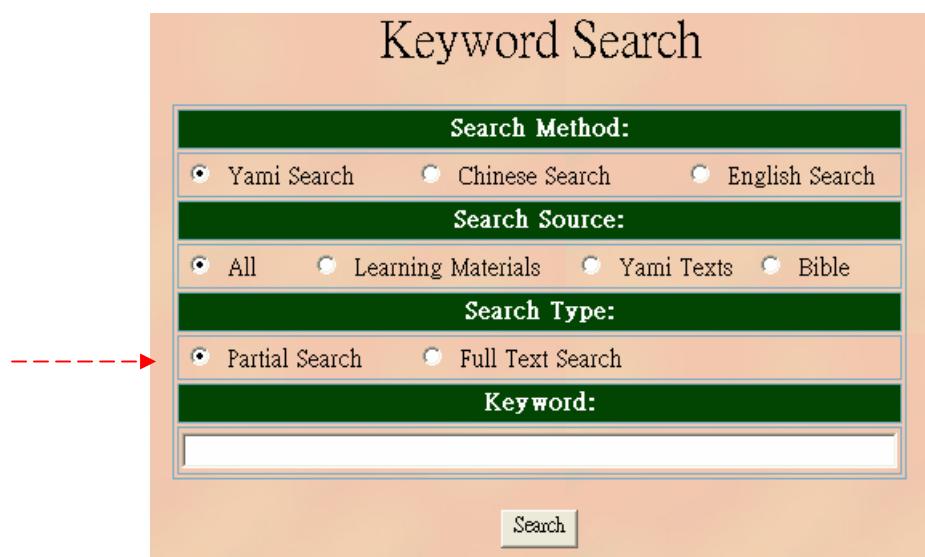
Figure 11. Image of the dictionary in Digital archiving Yami language documentation.

In the category, it mediated lots of using experience in operating the site. Their perceptions were worthwhile to treat them as the directions in developing the site. It presented the overall learning needs in Table 15 as the summary for the section.

Table 15. Overall learning needs from using experience.

	Learning needs and suggestions
Text	1. Sound track for whole text and each sentence were demanded. 2. The window of playing sound track would be covered the text.
Grammar	It should have highlight markers for the grammar points.
Demonstrate	It would be better to increase sound demonstration in the section.
Dictionary	1. It would be better to become the archiving digital in the Digital archiving Yami language documentation.
Game	1. Some stems contained too many options (usually between 3 to 5). 2. Little part of the game content was not consistent with the classroom instruction. 3. More types of game were demanded, like testing word meaning, sentence patterns or word order. 4. Updating the site more often makes all the users synchronically get the latest materials.

4.3.2 Needs Analysis from Previewing the Site.

Looking back the former stages, it talked about students use the site to review the lesson. Preview was also the part of learning that should not be ignored. The participants were asked to preview lesson seven that would conduct next week. It reflected some unique concepts for the site. Also they may be able to regard as the learning needs of self-study because the context was alike that students learned Yami without teacher's instruction.

The results showed that the students operated the site materials in the order of the site arrangement, from Text, Grammar, Demonstrate, and Learning game. However,

the steps were not very efficient for learning Yami. S1 and S4 was discouraged that the conversation in text was so complicated (Excerpt 40). S2 stated that she read through the text but did not understand the idea of what should be noticed and learned (Excerpt 41). S3 anticipated that she could immediately catch the key of the lesson (Excerpt 42).

Excerpt 40
S1: 挫折蠻大的，看完(課文閱讀)後覺得好難喔…通常我看紙本會配合後面的單字來唸，這邊沒有，就比較吃力了
After finishing the text, I feel encouraged because it was so difficult. Often, I study Yami with the handout which contains the vocabulary list of the lesson. However, the site does not have it so that I will be more laborious in reading it.

They simultaneously maintained equivalent learning needs. For S3, the main sentence pattern should be underlined and could be connected to grammar analysis. For example, the sentence "maneysavat do keysakan" (Go catch crabs at the sea, of course.) could then be connected to the grammar point "verb derivation." It would be a nice addition that would make grammar and the context more closely correlated (Long, 2001). S4 suggested that the top of text reading could list the vocabulary and sentence pattern of the lesson.

Excerpt 41
S2: 看完課文閱讀，我有種還是沒有進入這課狀況的感覺
After finishing the text, I do not the feeling that I enter the field of the lesson.

Excerpt 42
S3: 大家應該都一樣吧，一進入新的一課，就想要立刻知道這一課要學什麼內容、單字、文法、句型...希望在這個課文閱讀也可以
Everyone should be same with me. When receiving a whole new lesson, he/she would like to directly know what would be learned, like vocabulary, grammar, ad sentence pattern. I expect that the text could reach the goal like that.

For further discussion, the materials were supposed to be arranged in the inclination of top-down. At the beginning of a lesson, it supplied the user with a context. Grammar and a demonstration of sentence pattern then followed. However, the user obviously preferred to have the over-all picture of the language elements in a unit, like vocabulary, grammar, and sentence pattern. It showed they preferred the unit the strategy to be bottom-up. The phenomenon could be traced to their learning experience previously. They expressed that they were used to the arrangement of traditional textbooks of bottom-up strategy. Hoffman (1997) advised that both top-down and bottom-up were necessary as strategies to solve problems in learning effectively. It might be the time for the students to accept the new one, the top-down strategy. Moreover, it was also important to make the site more user-friendly for the bottom-up learners. The participants recommend that the operation of the site was adapted operating the site from Demonstrate to Grammar and the Text reading, because they thought text was more like continuous learning from grammar and sentence patterns. Therefore, the analysis finds two suggestions for developing the site. First, it could manipulate the existing materials in the Yami textbook to increase word list section in each lesson. Second, it will be more successful, if the site can provide a user guideline for the users who were inclined toward bottom-up strategy. Recently, the project team has added the sitemap in the website to introduce the structure of each section. A user can more easily find what he/she want in the site.

4.4 Discussions among the Three Stages

The study spent one year to collect various needs for the Yami language learning

center. From the aspect of learners' expectations, using experiences and learning difficulties, it provided valuable opinions to promote the website. In the first stage, because it was just an on-going project, the participants tended to indicate the "deficiencies" of the site. For example, the students demanded to add email address of the authors, sound track of sentence, looking up vocabulary by Chinese, and game practices. These needs were put in practice by the project team and the website became more completed. After one year to the third stage, the website was changed and could compete with the ones of major languages. The users supplied more detailed information for how to adjust the existed content or interface in the site and make them become more user-friendly. These two stages focused on non-native speakers' needs from the graduate student who took the Austronesian course in Providence University. In the second stage, the researcher did a field trip on Orchid Island to understand the perceptions from the native speakers of Yami. The results showed diverse needs from the non-native people. Practice for spelling and examination questions were strongly demanded.

After the three stages, the study indeed gathers various needs for the website and the project team would like to realize all of them. However, there is always the distance between reality and ideal and we should think about a question "Whose needs should be the first consideration? Native or Non-native speakers?" In fact, the answer can be found by counting how frequent and how long they use the website. The graduate students of the Austronesian course in the first and third stage use the website at least one or two times in a week and then they spend over half hour to learn Yami in the site. As to the native participants in the second stage, they may have few chances to contact with computers due to economical limitation, so it is difficult for them to learn Yami in the site. Additionally, some of them think the website is not so useful in their junior school life but they suppose it will help them to remember their

own native language when they leave Orchid Island. The phenomenon shows that they may not have enough motivation now in using the website. Comparing with the two groups students, the non-native speakers tend to use the site more regular and frequent. Therefore, the project team will take the needs from the students in Austronesian course as the first consideration in adjusting the website. However, it does not mean that the project would like to totally neglect the opinions from the native speakers. After synthesizing the results and discussion among the three stages, there are some common learning demands for the website among all the participants. First, the sound track of text reading has been demanded to run at a slower speed so that the user can listen and comprehend it. Pictures and animation could provide context in assisting students understand the text and pique their interest. The grammar analysis should change the typeface and color to make users to catch the forms more easily. The Demonstrate section can add sound demonstration. It not only makes the students review the classroom activity again, but also provides more opportunities to practice listening, speaking, and sentence pattern. Finally, the games can be designed for more variety but not restricted to grammar. If the project website can put these ideas into practice, it will become more user-friendly and effective to cater to various users.

Chapter V

CONCLUSIONS

E-learning technology is a key component in language education and it is very significant to evaluate whether or not the materials benefit the learners. This study attempted to develop a project website for an endangered language with needs analysis. By way of interview, the research collected various learning needs from students' expectations before they came to the class, their experiences using the website, and learning difficulties and strategies. These opinions were valuable in enhancing the effectiveness of the website.

In the first stage, the results found that cultural information was strongly expected before the students used the website. Pictures were another feature which raised the users' attraction. In addition, pronunciation and grammar were their mainly learning difficulties. Therefore, on-line practice exercises were required the most among the users because they could use it to effectively assist their learning. A highlight marker in the grammar section of the site was important for the users to grasp the rules. The sound track of whole text should be separated into sentences. Furthermore, they also hoped the on-line dictionary could apply Chinese when looking up words.

In the second stage, the website was introduced to the native speakers. Through the mixed design, the website was evaluated by the students at Lanyu Junior High School. The quantitative research found the website received overall positive feedback from the 116 participants, with most items gaining over 65% agreement and with some of them were over 80%. In the in-depth exploration, the results indicated that the second and third grade students were more willing to use the site for acquiring

Yami and found the on-line dictionary to be especially helpful for them. Moreover, the results indicated that adding animation, films, and pictures were significantly more sought after than with other options. It indicated that the three components were the most important learning needs that should be added to the site.

The qualitative design of the second stage collected more information about students' perceptions. First, students highly expected to read the old tales before using the website and it had solved in the third and fourth volumes' teaching materials. Second, spelling was the major learning difficulty among all language skills and they hoped the website could add practice exercises about word meaning and spelling. Moreover, the students would like to practice speaking skills, so they anticipated that the section of "Demonstrate" could increase sound track the same as with the reading. Finally, the on-line dictionary and games were highly praised by all participants. The existence of the Yami language learning center was meaningful for the native speakers. The website allows students to remaining contact with their own language, no matter where they are in the world.

In the third stage, the students used the site to review the classroom lessons. Some difficulties were discovered and provided many comments for the website. In text reading, the users needed a sound track both for listening to the whole text and a sound track sentence by sentence. User requested that the speed should be slowed down. Next, it was requested that the on-line dictionary be able to find a word by inserting partial or full word like the one in the website of Digital archiving Yami language documentation. Finally, the users thought the games had a few mistakes. Some stems contained too many options and several game items were not consistent with the instruction. It was important that more variety of games be offered for testing word meaning, sentence patterns or word order.

In addition, the site was also viewed as needing a preview for the class. The

results found that students did not adapt the top-down design that supplied the user with a context first and then the grammar and sentence pattern. The user obviously preferred a bottom-up strategy to understand the language elements of a whole unit, like vocabulary, grammar, and sentence pattern. The participants recommended that the site would be better to adapt for operating from Demonstrate to Grammar and the Text reading, because they thought text was similar to continuous learning from grammar and sentence patterns. Therefore, the research team could utilize the existing materials in the Yami textbook to increase the word list section in each lesson. Also the website would be more successful, if the site could provide a guideline of how to use the site for the users who prefer a bottom-up strategy.

The study may have some possible limitations. First, beside the quantitative inquiry in the second stage, this research is a qualitative study which can not be applied to other situation. In addition, technology evaluation is more challenging and time consuming than a textbook (Burston, 2003). Due to time constraints, the design may not cover the all directions necessary to investigate the learning needs for the site.

However, the study indeed collects varied and useful opinions, benefiting and contributing to the website. Through the efforts of project members, part of the learning needs been incorporated the site. First, the users are able to listen to the sound track for each sentence. Second, the on-line dictionary now allows insertion of both Yami and Chinese when looking up vocabulary. Third, the homepage now provides the email address of the site developers so that the operator can resolve the errors. Games for practicing the forty lessons have been completed. The users believe it is useful to review what they have learned. Next, the spectrogram contains sound demonstrations of specific words and sentences that may assist the user in overcoming listening or speaking difficulties. Recently, the grammar analysis section changed the

color of Yami words in order to differentiate inform the Chinese words. It is successful in that the students feel the webpage is more comfortable and easier to understand the grammatical points.

This research proves the importance of evaluating e-learning tools. Initially, the ongoing project received more negative comments than positive. It shows the internet resource was not always suitable for the learners. After continuous work and upgrades, the website has gradually improved and gained the praises of the users. In order to perfect the project website, some future studies can to be continued. First, besides the learners of the course, the urban Yami youngsters who do not live on Orchid Island are the other group of users who could benefit to learn from the website. It is important conduct a needs analysis of their views. Second, the role of the website is not limited to assistance in classroom learning, so future research can analyze the site from a self-study point of view and investigates user's perception. The final suggestion one is to collect detailed information on how to modify the website content and interface. For example, the study indicates the highlight marker is important in grammar analysis but it does not point out which parts should be changed and what typeface and color the user prefers. More specific information will give the team a clearer direction to work towards on the site. The study is not the end. The voyage of developing the Yami language learning center has just begun.

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APPENDIXES

Appendix 1. Interview questions for the first stage (English version)

Interview questions with the students

Part 1--

I.   Website user background (warm-up questions)

1. Did you use website/software to learn language before?

   Which language did you learn?

   Why did you use the website/software to learn the language?

II.   The expectations/motivation of the participant

1.   Why did you come/ choose the course?

2.   What were your expectations of the course? Or what did you want to learn?

     So what did you want/expect to find in the website?

III.   Students activity in the website

1.   How often you use the website?

     How long do you stay in the website when you use it?

2.   When will you use the website? Before the class, after the class, or both.

3.   What functions do you use in the website?

Part 2--

4.   Describe your experience when you used the website. Or any problem that you

face when you use the website?

The interviewer can use the outlines (Lwo, 2004) to guide the learners and make their

comments more concrete.

Ａ‧**Evaluation of teaching materials/ content in the website**

a.   The relevancy of the material/ content

1.Containing clear teaching objectives. It means what you will learn in the lesson.
2.Containing complete teaching materials
3.The materials are arranged from easy to difficult.
4.The material content is related to learners' real life.
5. Each topic of the lesson provides related and extended information.

b.   Attraction

6.The headline of the website can attract the user
7. It is easy to find the website by inserting keywords in some famous portal sites, like yahoo or google.
8.The content of the materials is interesting and motivates learners' interest.

c.   Correctness

9.The content is logical. It means you can find what you want, after clicking the link.
10.The authors of the documents have authority in the field.
11.The words, pictures, and video are all correct/ without mistakes.
12.The materials are legal/ have copyright.

d.   Currency

13.The website is updated regularly.	
14.Top news are posted instantly.	

B·(Evaluation of website interface)

a.   Layout

15.Web pages are designed with sense of beauty.	
16.Pictures or graphs are appropriately added in the descriptions.	
17.Contain high-light markers by different typefaces or colors.	
18.The operation of website considers users' technology proficiency.	
19.Contain clear web pages and menu.	

b.   Audio-video effects

20.Audio or video can be played fluently.	

c.   Interaction

21.Provide simple and clear operation instructions.
22.Learners can easily go back to the homepage or other web pages
23.Chatroom is available in the website
24.Provide the authors' e-mail, phone number, or address etc.
25. Contain the function that you can search the information in the website and from other website.

d.   Learner-control

26.Provide appropriate practices.	

27.Provide the function of recording learning progress.	
28.Provide assessment and immediate learning.	
29.Learner can control their learning progress.	
30.The website content considers individuals' differences.	

Part 3---

VI. Learning experience/strategies/problems in the classroom?

1. When you learn Yami language, what are the difficulties you face?

   (listening, speaking-pronunciation or other difficulty, reading, writing-spelling or

other difficulty, grammar, or other difficulties.)

   What kind strategies do you use to overcome the difficulties?

What do you expect to find in the E-learning website to overcome your difficulties?

Or what do you expect to find in the E-learning website to fit your learning strategies?

	Learning difficulties and strategies	E-learning needs
listening	Difficulties: Strategies:	
speaking-pronunciation or other difficulty	Difficulties: Strategies:	
reading	Difficulties: Strategies:	
writing-spelling or other difficulty	Difficulties: Strategies:	
grammar	Difficulties: Strategies:	

other difficulties	Difficulties: Strategies:	

3. Which part is the most difficult, when you learn Yami language?

    Are you thirsty for the helps from the website?

4. In conclusion, do you think that you need the help from the website?

V.   Other needs

What are other needs for the website? (for technical or learning problem)

Appendix 2: Interview questions for the first stage (Chinese version)

<div align="center">訪談問題 (學生)</div>

I.   Website user background (warm-up questions)

1. 你是來自哪一系或組？

2. 你之前有用過網站或軟體學語言嗎？

   是學那個語言呢？

   爲什麼要用那個網站或軟體學那個語言呢？

II.   The expectations/motivation of the participant

1. 你爲什麼要修這門課呢？

2. 你對這門課有什麼期待? 或是你想要在這門課學到什麼？

    那麼，你想要/期待在這個教學網站找到什麼？

III.   Students activity in the website

1. 你多久用一次這個網站？ 你一次大概都使用多久的時間？

2. 你是什麼時候會用這個網站？上課前、下課後，還是都有用

3. 網站哪個功能是你最常用的？

4. 敘述一下你在使用這個網站的經驗，或是任何你遇到的問題‧

The interviewer can use the outlines (Lwo, 2004) to guide the learners and make their comments more concrete.

A‧Evaluation of teaching materials／content in the website

a.   The relevancy（適切性） of the material content

包含明確的教學主題	Y／N	
網站內容具完整性	Y／N	
網站內容依照難易安排	Y／N	
網站內容生活化	Y／N	
提供與主題相關的延伸資訊	Y／N	

b. Attraction（吸引性）

網站標題能吸引學習者	Y／N	
在知名的入口網站，輸入關鍵字，能容易找到（網站）	Y／N	
網站內容很有趣而且能引起學習者的興趣	Y／N	

c. Correctness（正確性）

網站內容有邏輯性（點選連結能找到想要的內容）	Y／N	
文件作者具備該領域的權威	Y／N	
內容（文字、圖、圖表）均正確無誤	Y／N	
網站內容具合法性／版權	Y／N	

d. Currency（即時性）

網站內容定期更新／維護	Y／N	
即時公告重要資訊與最新活動	Y／N	

B．(Evaluation of website interface)

e. Layout（網頁畫面安排）

網頁畫面具整體美感安排	Y／N	
文字敘述能適時加入圖表或照片	Y／N	

用不同字體或顏色作為重點標記	Y／N	
使用介面考慮到使用者的電腦技能	Y／N	
具有清楚的網頁與選單	Y／N	

f. Audio-video effects（影音效果）

影音容易撥放且流暢	Y／N	

g. Interaction（互動效果）

提供簡明的操作指導	Y／N	
可以隨時回到首頁或其他網頁	Y／N	
設有討論室	Y／N	
註名作者之電子郵件、電話、地址等聯絡方式	Y／N	
具有搜尋功能	Y／N	

h. Learner-control（學習者主控權）

提供適當練習	Y／N	
提供線上學習歷程紀錄的功能	Y／N	
提供學習評量與立即回饋	Y／N	
學習者可以掌握自己的進度	Y／N	
教學策略考慮到學習者的個別差異	Y／N	

VI. Learning experience/strategies/problems in the classroom?

1. 當你學 Yami 的時候，你遇到了什麼困難？

（聽，說－發音或其他，讀，寫－拼字或功課或其他，文法，或其他）

那你會想要到網站找到什麼樣個功能，去幫助你遇到的困難？

聽	
說－發音或其他	
讀	
寫－拼字或功課或其他	
文法	
其他	

2. 當你學 Yami 的時候，你使用什麼樣的學習策略去克服學習問題／困難？

（聽，說－發音或其他，讀，寫－拼字或功課或其他，文法）

那你會想要到網站找到什麼樣個功能，去符合／幫助你所用的策略？

聽	
說－發音或其他	
讀	
寫－拼字或功課或其他	
文法	
其他	

3. 上列哪一項是你認為學 Yami 語言裡，遇到最困難的問題？

你會很需要在網站上尋求幫助嗎？

4. 總結來說，在你學 Yami 語言時，你認為需要這個網站嗎？

V. Other needs

對於這個網站，你有任何其他的意見或需求嗎(for technical or learning problem)？

Appendix 3. The original version of Lwo's study (2005), modified version in the study, and the reasons of modifying them.

	Original version	**Modified version**	**The reasons of modifying**
Item 1	Contain clear teaching objectives.	Add explanation: "You know what you will learn before you enter the lesson."	Some Ss form linguistic group did not understand the meaning of teaching objectives.
Item 5	Provide extended information related to the topic.	Modified the description: Each lesson provides extended and related information.	The student did not understand the original one in Chinese.
Item 7	It is easy to search the website from any portal site.	Add examples: It is easy to search the website from any other portal site, like yahoo or google.	Most students did not know what portal site was.
Item 9	The content of website is logical.	Add explanation: "If you click the links, you can find what you want."	All students did not know the meaning of "logical" in the question.
Item 18	The interface considers user's technology proficiency.	Modified the word "interface" into "operation of website"	The word "interface" seemed to be a jargon for the participants.
Item 25	Contain the function of search.	Add the description: Contain the function that you can search the information in the website and from other website.	All students confused that "search" stood for only searching the information in the website or other websites.
Item 30	Teaching strategies consider individuals' differences.	Modified the words "teaching strategies" into "the content of the website"	Some Ss from linguistic group did not understand the meaning of teaching strategies.

Appendix 4: The questionnaire of investigating general ideas about the website in the second stage (English version)

1. Website design is easy for me to operate and learn Yami language.	5	4	3	2	1
2. Website materials are good to fit the daily life in Lanyu.	5	4	3	2	1
3. I think the four volumes' teaching materials can help my native language acquisition after using the website.	5	4	3	2	1
4. I am interesting in learning Yami language after using the website content.	5	4	3	2	1
5. Web page is designed with sense of beauty and comfortable.	5	4	3	2	1
6. It is easy to find what I want in the website.	5	4	3	2	1
7. Sound demonstration is clear and comprehensible.	5	4	3	2	1
8. I find e-learning making me learn Yami without time limit.	5	4	3	2	1
9. I think the exercise fit my learning needs.	5	4	3	2	1
10. I think I am willing to spend over 20 minutes to use the website in learning Yami.	5	4	3	2	1

Note. It is a questionnaire designed with likert scale from 1 to 5. 5 = strongly agree,. 4 = agree. 3 = I do not have any opinions, 2= disagree, and 1= strongly disagree.

11. After trying the on-line dictionary, I think it is helpful for my Yami learning.	5	4	3	2	1
12. I can understand the part of grammar	5	4	3	2	1
13. I can understand the spelling symbols in the website.	5	4	3	2	1

14. I think the website could be improved in the following aspects
（**The participant can choose one more options.**）

□1.Layout design　　　□2.typeface　　　　□3.Add animation
□4.Add films　　　　　□5.Add pictures　　　□6.Add chatroom
□7.Add highlight markers　　□8.Add extended information
□9.Add assessment　　　□10.Add test items for certification of native language
□11.Add related website connections　□12.Add the function of search

The data will only be used for research. All the content will be kept in secret.

Grade: _____
Village: _____
How often do you speak native language _____

Thanks for your cooperation in answering the questionnaire ☺

Appendix 5: The questionnaire of investigating general ideas about the website (Chinese version)

你好，我們是靜宜大學英國語文學系與資訊傳播學系的研究團隊，針對雅美語（達悟語）設計一個數位學習的網站，提供使用者運用網站來學習。請使用此學習網站後 **"圈選"** 您同意的程度。

非常感謝您的合作，您的意見將非常寶貴，謝謝☺

	完全同意	同意	無意見	不同意	完全不同意
5. 網站的編排方式簡單，讓我可以很快進入族語的學習。	5	4	3	2	1
6. 網站提供很好的學習教材，剛好符合我們蘭嶼日常生活所需要。	5	4	3	2	1
7. 使用完網站後，我認為這四冊的教材可以幫助我的族語學習。	5	4	3	2	1
8. 當我使用完後教材的內容，讓我對於學習族語感興趣。	5	4	3	2	1
5. 網頁畫面有整體美感，看起來舒適。	5	4	3	2	1
6. 網頁選單清楚，可以容易找到我要找的東西。	5	4	3	2	1
7. 教材內，老師的示範聲音清楚且容易了解。	5	4	3	2	1
9. 我發現數位學習可以讓我不受時間限制來學習族語。	5	4	3	2	1

	完全同意	同意	無意見	不同意	完全不同意
9. 我覺得教材的課後練習符合我的學習需要。	5	4	3	2	1
10. 我認為我願意每一天花 20 分鐘以上來用此網站學習族語。	5	4	3	2	1
15. 試用過教材的字典功能，我覺得此功能對於族語學習有幫助。	5	4	3	2	1
16. 我能夠清楚了解文法解析的部分。	5	4	3	2	1
17. 我能夠清楚了解網站內的拼音標記。	5	4	3	2	1

18. 認為網站可以在以下的地方來改進（**可重複勾選**）

□1.版面設計　　　□2.字體大小　　　□3.加入動畫
□4.加入影片　　　□5.加入圖片　　　□6.加入討論室
□7.加入重點標記　□8.加入課後補充資訊　□9.加入評量方式
□10.加入族語測驗題目　□11.加入相關網站連結　□12.加入搜尋功能

本問卷採不記名方式，以下資料只為研究用途，內容完全保密。

目前是 _____ 年級
你住在 _____ 村
你在家裡是否常說族語? _____

謝謝您協助我們回答此份問卷☺，

讓我們一起來為推廣雅美語（達悟語）來努力。

Appendix 6. The questionnaire of the qualitative part in the second stage (English version)

Interview questions   （For student participants）

IV.   Website user background (warm-up questions)

1. Which village are you from?

2. Did you use website in learning language? Which language did you learn? Why did
   you use the website or package in learning the language?

V.   The expectations/motivation of the participant

1. What do you expect to learn when you attend the course of native language?

2. Besides the course of native language, what places do you expect to provide native
   language learning / how do you expect to learn native language after school?

3. When you know Yami language learning center, what do you expect to find in
   assisting the language learning?

III.   Students' learning experience and strategies of Yami language

1. When you learn Yami language, what are the difficulties you face?
   (listening, speaking-pronunciation or other difficulty, reading, writing-spelling or
   other difficulty, grammar, or other difficulties.)
   What kind strategies do you use to overcome the difficulties?
   What do you expect to find in the E-learning website to overcome your difficulties?
   Or what do you expect to find in the E-learning website to fit your learning
strategies?

	Ss' lrg problems	Ss' lrg strategies	Expectations for the site
Listening			
Speaking Ex. pronunciation			
Reading			
Writing Ex. Spelling			
Grammar			
Others			

2. Which aspect is the most difficult when learning native language?

3. After school, how will you review or preview Yami language? How long do you spend in it?

4. In conclusion，do you think the website is helpful when you learn native language?

VI.   Student' using experience of the website

1. How do you feel the website content? Is it too hard or easy?（content）

2. Do the teaching materials in the website fit the daily life in Lanyu?

3. Does the website attract your attention/interest? Do you like learning Yami more?

4. Do you think the website layout is comfortable?（layout）

5. Do you have any opinions about the pictures and typeface?（layout）

6. Do you think the website is easy to operate? Do the audio can be played fluently?
（layout）

7. Do you think the multimedia makes you like to learn native language more?

（layout）

8. Will you anticipate the website contain chatroom, site map, and search engine?

（interaction）

V. Evaluation

1. How do you feel when you use the part of Text reading? Why?

2. How do you feel when you use the part of Grammar analysis? Why?

3. How do you feel when you use the part of Activities and Demonstrate? Why?

4. How do you feel when you use the part of Exercise? Why?

5. How do you feel when you use the part of on-line dictionary? Why?

6. How do you feel when you use the part of learning games? Why?

Finally, do you have other needs or opinions to the website?

Appendix 7. The questionnaire of the qualitative part in the second stage (Chinese version)

VI. Website user background (warm-up questions)

1. 請問你是來自哪個村呢？

2. 你之前有用過網站或軟體學語言嗎？是學那個語言呢？

   爲什麼要用那個網站或軟體學那個語言呢？

VII. The expectations/motivation of the participant

1. 你在上族語課的時候，你希望學到什麼？

2. 除了族語課以外，你希望其他地方，提供你什麼樣的族語學習？

3. 在你得知有族語學習網站時，你期待在這個教學網站找到什麼能幫助你的學習呢？

III. Students' learning experience and strategies of Yami language

1. 當你學 Yami 的時候，你遇到了什麼困難？

   （聽，說－發音或對話，讀，寫－拼字或功課或其他，文法，或其他）

   你使用什麼樣的學習策略去克服學習問題／困難？

   那你會想要到網站找到什麼樣個功能，去幫助你遇到的困難？

	Ss' lrg problems	Ss' lrg strategies	Expectations for the site
聽			
說－發音或			

其他			
讀			
寫－拼字或功課或其他			
文法			
其他			

2. 上列哪一項是你認為學族語，遇到最困難的問題？

   所以你會最希望網站上可以增加 ＿＿＿＿＿ 的部分嗎？

3. 那麼在放學後，你會用什麼方式去預習和複習族語？大約花多少時間呢？

   （或是你在考試前，會用什麼方式去準備？）

4. 總結來說，在你學族語言時，你認為這個網站會不會對你有所幫助嗎？

VII. Student' using experience of the website

1. 你覺得這個網站的內容如何？會不會太難或太簡單？（content）

2. 網站的教材有符合蘭嶼日常生活嗎?

3. 你覺得這個網站有吸引你的注意嗎？

   能引起你的興趣嗎？（attraction）

   讓你更喜歡學習族語嗎?

4. 你覺得這個網站的畫面安排舒適美觀嗎？（layout）

5. 圖片和字體有沒有任何的問題？（圖片太多／太少，字體太亂／太呆版）

   （layout）

6. 你覺得這個網站容易操作嗎？媒體撥放的流暢嗎？

   （你可以知道你要找的東西在哪點選？）　　（layout）

7. 你覺得網站的媒體能讓你更想學族語嗎？（layout）

8. 你會希望這個網站設有討論室／留言版，網站導覽，搜尋功能？（interaction）

V. Evaluation

1. 在課文閱讀的部分,你使用起來的感覺是如何? 為什麼?

2. 在文法解析的部分,你使用起來的感覺是如何? 為什麼?

3. 在學習活動 和 示範活動的部分,你使用起來的感覺是如何? 為什麼?

4. 在課後練習的部分,你使用起來的感覺是如何? 為什麼?

5. 在線上字典的部分,你使用起來的感覺是如何? 為什麼?

6. 在學習遊戲的部分,你使用起來的感覺是如何? 為什麼?

對於這個網站，你有任何其他的意見或需求嗎(for technical or learning problem)？

Appendix 8. The third stage interview questions (English version)
Questions for the first time interview

<div align="center">第一次訪談問題</div>

Website user background (warm-up questions)

1. Which group are you from ?

2. Did you use website in learning language? Which language did you learn? Why did

you use the website or package in learning the language?

The expectations/motivation of the participant

3. Why do you take the course?

4. What are your expectations for the course?

5. How did you feel in the first class today?

Appendix 9. The third stage interview questions (Chinese version)
Questions for the first time interview

第一次訪談問題

Website user background (warm-up questions)

1. 你是來自哪一系或組？

2. 你之前有用過網站或軟體學語言嗎？

   是學那個語言呢？

   爲什麼要用那個網站或軟體學那個語言呢？

The expectations/motivation of the participant

6. 你爲什麼要修這門課呢？

2. 你對這門課有什麼期待? 或是你想要在這門課學到什麼？

   那麼，你想要/期待在這個教學網站找到什麼？

+今天第一次上雅美語的感覺如何?

Appendix 10.

Questions for the second, third, and forth time interview (English version)

The second, third, and fourth time interview

Topic：   Date :

Homework last week：

Learning difficulties and strategies

1. When you learn Yami language, what are the difficulties you face?

   (listening, speaking-pronunciation or other difficulty, reading, writing-spelling or

   other difficulty, grammar, or other difficulties.)

What kind strategies do you use to overcome the difficulties?

What do you expect to find in the E-learning website to overcome your difficulties?

Or what do you expect to find in the E-learning website to fit your learning strategies?

	Ss' lrg problems	Ss' lrg strategies	Expectations of site
Listeing			
Speaking or pronunciation			
Reading			
Writing spelling			
Grammar			

Students' experience and perceptions afer using the site

1. What functions did you use ?

2. Howe do you feel after you use _____ ?

   -Do you think it is useful in the Yami learning?

     If the answer is "Yes", why?

     If it is "No", why?

Function	Y／N Ss' experience	Expectations for the site

Lesson __ & Scores ___ ，

*Do you think it can stand for the result for your Yami learning in the lesson ?

*Do you think your Yami learning is makine progress?

  Yes→Which skill do you improve? Do you think it is related to using the website?

       Why?

No→ What is your learning difficulties? Do you think what the website should

       provide in order to improve your Yami language learning>

Using difficulties

1. When using text reading:
     --Do you think the speed of download the sound films is fast or slow? Will it lag?
     --The sound track is opened in another window.
        Do you think it will be inconvenient for you?

2. Do you use the section of Grammar analysis?
     --Yes→ How do you feel when using it?
     --No→ Why not you use it? Please use it for 5 minute and express your feelings.

3. Do you use the section of Activity and Demonstrate?

Yes→ How do you feel when using it?

No→ Why not you use it? Please use it for 5 minute and express your feelings.

4. Do you use the function of on-line dictionary?

Yes→ How do you feel when using it?

No→ Why not you use it? Please use it for 5 minute and express your feelings.

5. GAME:

   --How do you feel after using it? Does the game fit what you learn in the classroom?

   --Is there anything have to be modified for the part?

Other comments

Appendix 11

Questions for the second, third, and forth time interview (Chinese version)

第二.三.四次訪談問題

課程內容／文法主題：   Date：

上禮拜作業：

Learning difficulties and strategies

1. 你這一週學雅美語的時候，你遇到了什麼困難？

   （聽，說－發音或對話，讀，寫－拼字或功課或其他，文法，或其他）

   你使用什麼樣的學習策略去克服學習問題／困難？

   那你會想要到網站找到什麼樣個功能，去幫助你遇到的困難？

	Ss' lrg problems	Ss' lrg strategies	Expectations of site
聽			
說－發音或其他			
讀			
寫－拼字或功課或其他			
文法			

Students' experience and perceptions afer using the site

1. 你剛剛使用了哪些功能？

2. (針對使用者用過的功能) 你對於＿＿＿功能，使用起來的感覺如何？

（若使用者沒有意見可從網站內容／操作／排版／功能等來引導）

   你認為對於你的雅美語學習有幫助嗎？

如果有→爲什麼？

如果沒有→要怎麼改才能幫助你的雅美語學習呢？

功能	Y／N　Ss' experience	Expectations for the site

＊練習（第__課）幾分__，你覺得可以代表你在課堂上學習雅美語的成果嗎？

你覺得你的雅美語有進步嗎？

有→哪一方面有進步？你的進步跟網站有關嗎?WHY?

沒有→你的困難在哪裡／或你覺得你哪裡學得不好？你覺得爲什麼?

　　　網站要怎麼樣才能幫助你(如果沒有老師的話)？

Using difficulties

1. 課文閱讀方面: 在使用課文閱讀的時候
   --下載速度快 OR 慢?是一次就下載完整的句子嗎?會不會 LAG?
   --聲音檔是在另外一個視窗開啓嗎?這樣會不會不方便?

2. 請問你有使用文法解析的部分嗎?
   --有→你使用起來的感覺如何
   --沒有→爲什麼不用呢? 請你現在使用 5 分鐘看看.　(再請問他們的感想)

3. 請問你有使用學習/示範活動的部分嗎?
   --有→你使用起來的感覺如何
   --沒有→爲什麼不用呢? 請你現在使用 5 分鐘看看.　(再請問他們的感想)

4. 字典查詢:如果作業有的話就不用問

5. GAME:
   --使用後有什麼感想,有符合你課堂所學的嗎,
   --有地方需要改進嗎?

其他意見

Appendix 12. Questions for the fifth time interview with using the website in preview (English version)

1. You have used all the functions in the website? Howe do you feel about it (from text reading to learning games)? Is it helpful previewing the lesson?

2. Is it difficult in studying text reading without instructions?
   After you use the text reading, what did you learn from it?

3. How do you feel about grammar analysis?那麼文法解析的部分怎麼樣呢?
    Is it helpful to understanding the lesson more or catching the key of it?

4. How do you feel for Activity and Demonstrate without instructions since it is the core of the classroom activity?

5. Can you finish the part of learning game?

7. Do you have any suggestions after learning the Yami language without teachers in the website?

Appendix 13. Questions for the fifth time interview with using the website in preview (Chinese version)

1. 你剛剛整個使用起來，從課文閱讀到遊戲，你使用的感覺如何? (可以幫你預習下一課嗎?)

3. 你覺得課文閱讀上，沒有老師的教導，使用網站來學會不會困難?
    -那麼你用完課文閱讀，你覺得你得到了什麼?

3. 那麼文法解析的部分怎麼樣呢?
    有幫助你更了解課文閱讀或是這一課的重點嗎?

4. 那麼在學習活動和示範活動，你使用起來感覺如何，尤其這個是上課的重心，沒有老師的帶領跟示範?

5. 遊戲方面，你還可以應付嗎?

8. 這樣子整體使用下來，以一課沒有老師教導的課程，你有什麼建議嗎?

Appendix 14. The image of the fifth questions in the game of lesson two
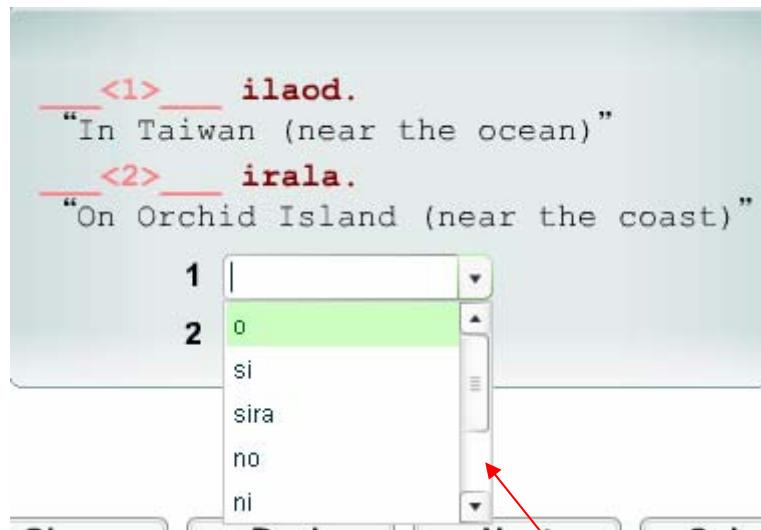
(Students need to pull it down to see other options.)

Appendix 15. The image of the final questions in the game of lesson one.