Development of Linguistic Contents for Contextual Dialogue

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Abstract— **New teaching and studying methods using educational contents are gradually widespread with the advancement of information and communication technology. As educational contents, in this paper, we design and implement linguistic contents for studying essential expressions applied to various situations of real life. In detail, the linguistic contents are run on web environments, and have suitable animations for learning essential expressions based on several foreign languages in contextual dialogues. Also, useful functions are included in contents to reinforce what users have learned.**

Index Terms— **educational contents, e-learning, web-based instruction**

I. INTRODUCTION

Due to the development of information and communication, one of main features in the information society is possible to offer valuable information or services via on-line internet. As the educational value of ICT(Information and Communication Technology) has been spread universally, the world's major countries are trying to build high-speed communication networks as social infrastructure[2,3]. Especially, internet can be able to provide various perspectives, experiences, and opportunities as well as timely information. Therefore, it can be an essential tool for the knowledge-based society that requires abilities related to flexible thinking and creative problem solving[4,5].

Based on internet that has very different natures from existing learning media, in our country, the educational use of ICT should be required increasingly. Also, internet has changed many parts of educational system profoundly. Most teachers and learners, therefore, have been recognized internet as a type of learning tools. Most of all, web-based instruction can be easy to use. In addition, it has the ability to link various media types and information effectively. Thus, web-based instruction has been recognized as an efficient learning tool gradually. In particular, e-learning is more important increasingly[1].

The e-learning based on internet or other digital media is able to provide flexible and interoperable learning environments. It is also to offer a variety of learning activities from an educational point of view [2]. Despite the growth of e-learning system in current, however, educational contents serviced through internet are not enough to support effective learning for users from the viewpoint of quantity and quality.

As educational contents, in this paper, we design and implement linguistic contents for studying essential expressions applied to various real-life situations. In detail, the linguistic contents are run on web environments, and have valuable multimedia for learning essential expressions based on several foreign languages in contextual dialogues. The multimedia of contents is made up animations, voices and texts such as original language sentences. Also, useful functions are included in contents to reinforce what users have learned.

II. RELATED WORK

In general, learning programs based on ICT are grouped into CD-ROM title and on-line studying web site[1]. Because CD-ROM title is almost impossible to modify contents after release, it has a disadvantage that user's requirements can't be reflected. However, CD-ROM title has no restrictions like network speed and failure. Thus, it can be able to develop using various contents and formats, and utilize easily by users.

In on-line studying web site, on the other hand, it is possible to update contents and services continuously because of communication each other among learners, developers/teachers, and web masters. But, there are weak points such as problems related to network and the time restriction of service in web sites.

In case of web sites for studying foreign languages, first, Media English Animation[9] is educational digital materials for children based on animation movies. Because it provides contents related to real life, users can learn simple and useful English expressions in real-life situations. Also, users can learn more effectively since various functions are provided by Media English.

Juniver[6] offers educational contents based on sentence and vocabulary for beginners and children to learn foreign languages such as English, Chinese, Japanese, French and Italy. To enhance studying effectiveness, it makes use of animations based on Flash. Junier English school[7] is linguistic contents for

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beginners and non-specialists like the Juniver. Learners can be able to study English using various contents related to games, children's story, and so on.

For beginners, JaenengEdu[8] introduces picture-oriented contents of real-life English, dialogue dictionary, word, grammar, story and so on. Users may study simple expressions and words using these contents.

III. DESIGN

3.1 Analysis and Plan

To develop linguistic contents for situational conversation in this paper, analyze user requirements in the planning stage. Then, we should decide goals of contents, development tools, type of contents based on the results of analysis.

At the first of steps, we survey and analyze the existing CD-ROM titles and web sites for learning language. For the analysis, also, collect requirements of students that will be users of contents, and analyze development and service environments. The result of analysis is shown in Table 1.

TABLE 1.
USER REQUIREMENTS ANALYSIS

Requirements Analysis		
Stage	Analysis Target	Analysis Content
Development Purpose	Development Purpose	The target is students to learn foreign languages using contextual dialogues.
Development Scope	Learning content	Contextual expressions of foreign language by situations
	Learning Courses	-
Content Type	Content Type	Multimedia contents
	Teaching and Learning Type	WBI (Web-based Instruction)
Usage Target	Age	Anyone can use contents regardless of age to study foreign languages.
Demanded function	Internet Tools	Web applied technology
	Teaching and Learning Tool	-
Expected Results	Effectiveness of learning	Users can study foreign languages in visual contextual dialogues though animation.
	Economics	More greater the possibilities based on web
	Usefulness	Use widely advanced learning equipments

Based on the result of analysis, we determine repeated practice learning based on situations as the type of linguistic contents. There are three reasons for this decision. First, our linguistic contents are focused on learning essential expressions not grammars, second, considering beginners who have little or no language skills in real life, third, taking experiences on contextual dialogues happened in real-life situations.

To do this, our contents provide various virtual situations similar to real-life situations in order to take various experiences. Based on understating the contextual dialogues, users can be able to learn key words, phrases, sentences, and expressions in order to achieve studying goals. Also, to overcome the limitations of existing repeated practice contents depended on mechanical memorization and feedback, we should subdivide contextual conversations into sentences as base units in contents. Each sentence must be controlled freely by users in linguistic contents environments.

We decide that our linguistic contents are developed same as web-based contents which is run on web environments. Web-based contents have strong points that users are able to use contents anytime and anywhere via virtual space. Also, web-based contents are easy to modify according to users requirements through the rapid feedback, and have several advantages such as bidirectional interactivity. That is why it was decided in this paper.

3.2 Design

A story board is the final result of the design stage in educational content development. To make story board, subjects related to developed study domain should be subdivided into parts according to analyzed data of the plan phase, and whole educational flow charts should be created. In writing storyboard, learning strategies, interaction, navigation, screen design and applied information technology must be written.

Based on the requirement analysis of plan stage, the development purpose of contents is to study easily foreign languages by essential expressions. To learn foreign languages easily, also, contents should organize a variety of animations applied to contextual dialogues happened in real-life situations. Furthermore, contents must be realized to use by everybody regardless of age. Technically, the demanded function as the internet tool is to make use of web applied technology. Consequently, we design educational contents in order to use them easily and funny by beginners in learning foreign languages. The main goals of contents development are like as follows.

- Development of contents for learning the essential expressions of contextual dialogues applied to real-life situations.
- Providing fundamental communication skills by foreign language.

- Offering native speaker voices and original texts for contextual dialogues by foreign languages with animations.
- Providing beneficial materials for beginners with little or no skills of foreign languages.

In order to achieve the goals of the linguistic contents development defined in the previous step, we establish configuration strategies of contents considering the results of user requirements analysis in design stage. Table 2 shows configuration strategies of linguistic contents more details.

TABLE 2.
CONFIGURATION STRATEGY OF LINGUISTIC CONTENTS

Study subjects				contents				
Large Area	Middle Area	Small Area	Learning content elements	Type	Strategic level by level			
					Basic	supplement	Intensive	
Understanding	Listening	Listening to understand roughly	Understand after hearing contextual dialogue	Repeat play based situation	Play all of Contextual dialogue	View original language pronunciation	Play Contextual dialog by situation	
		Listening to understand details	Understand content of contextual dialogue after hearing	Repeat play based situation	Repeat the dialogue to hear and understand content of dialogue	View interpret ation	View Supplemental explanation by situation	

According to the configuration strategy of the contents, we classify with contents selection, language selection and situational selection for the purpose of creating story boards. In order to enhance the completion degree of contents, we should put emphasis on listening and understanding in design process.

In this paper, linguistic contents mainly consist of animation files and voice files. Also, these contents provide various contextual conversations by several foreign languages. Both interaction and educational effect, therefore, must be considered in the design stage. For that, it should be planned to be able to use simply and conveniently for users. Furthermore, images and icons are designed with colorful image and funny animation so that user can use it easily.

3.2.1 Contents selection
When users click on the expression menu in the menu bar of web site, it moves toward language selection screen for running linguistic contents. Fig. 1 shows the story board of main page in the web site.
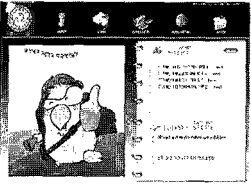
Screen Name	Content selection screen
Required media	Menu flash files
Layout	

	•Web site consists of expression menu, study menu and so on. •When mouse puts over the menu icon, a simple animation is active.
Button/Link	
Go to national selection screen	

Fig. 1. Story board of main page in web site.

3.2.2 Language selection
Basically, a simple animation is running automatically when users put the mouse over an icon in world map image. If users want to study a particular foreign language, click on the desired country in the selection screen. Then, it moves situational selection screen of the corresponding language.
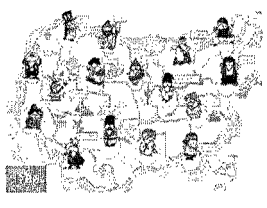
Screen Name	Language selection screen
Required media	Flash files represented several nations
Layout	

	• A world map in the background is made up 16 icons expressed foreign languages. • When mouse puts over an icon, a simple animation is running automatically. • When click on the icon, open the corresponding linguistic contents.

Button/Link			
	Go to the English learning content		Go to the Japanese learning content
	Go to the French learning content		

Fig. 2. Story board of language selection.

3.2.3 Situational selection
In order to want to study the contextual dialogues of various situations, users should click on the desired situation icon with mouse. When users put the mouse over the corresponding icon, an enjoyable animation is running automatically. If the icon is clicked, then, the initial screen of linguistic contents is active in the next.
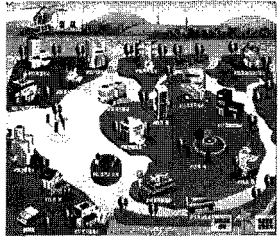
Screen Name	Situational selection screen
Required media	Flash files represented various situation
Layout	

	• A simple village in the background is composed of 20 icons expressed various situations such as hotel. • When mouse is put over an icon, a simple animation is running automatically. • When click on an icon, open the corresponding situational contents.

Button/Link			
	Go to the contextual dialogue content in Bus.		Go to the other language contents
	Go to the help screen		

Fig. 3. Story board of situational selection.

3.2.4 Linguistic contents

Users can choose all playing or playing by one scene in the linguistic contents. According to selection, users are able to choice several options such as open/close original language text, explanation, interpretation, additional explanation, pronunciation, and so on.
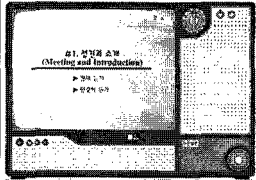
Screen Name	Main Screen of Linguistic contents
Required media	Contextual animation files, voice files related to dialogues by foreign languages
Layout	

	• Users can select all playing and playing by one scene. • TV image as a background is composed of four areas. • Animation area: shows various contextual dialogue animations. • Original text area: displays original language texts of contextual dialogues. • Commentary text area: displays original language, pronunciation and interpretation text of sentence per each scene in contextual dialogue. • Supplemental explanation area: shows additional explanations of each situation.

Button/Link			
	Open/Close original text area		Open/Close pronunciation text
	Open/Close commentary text area		Open/Close translation text
	Open/Close original language text		Open/Close supplemental description

Fig. 4. Story board of linguistic contents.

IV. IMPLEMENTATION

Based on story broads defined in design stage, we implement linguistic contents using Flash as development tool in this paper. Especially, to enhance learning efficiency, it provides appropriate animation running time as well as user-oriented controls. The contents, also, offer the consistency of linguistic contents screen layout and image display. From the point of use convenience, we implemented to support suitable screen layout and high resolution image according to user's environment. Also, in this paper, various multimedia data are built in linguistic contents like as follows.

TABLE 3.
CONSTRUCTED MULTIMEDIA DATA

Data Type	File type and size	
	Format	standard
Photo, Figure	jpg	More 640*480
Sound	mp3	
Animation(flash)	swf	More 320*240
Module	-	approximately 800*600

4.1 All playing in contextual dialogue

When users select a corresponding language menu and situation menu in the web site to study contextual dialogue, the main screen of linguistic contents comes into action like as Fig. 5. In this screen, users can select either all playing or playing by one scene.
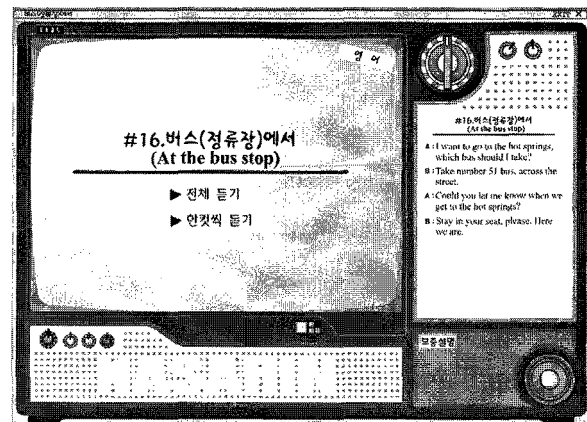
Fig. 5. Main screen of linguistic contents.

The main screen of linguistic contents should be implemented for the purpose of utilizing it easily by users. The basic concept is that the overall interface type of main screen is similar to television form for the purpose of giving familiar feelings to the user. For the point of layout, it is composed of four areas which are an animation area, an original text area, a commentary text area, and a supplemental explanation area.

TABLE 4.
AREAS OF LINGUISTIC CONTENTS

Area	Description
Animation	Displays contextual dialogue animations in foreign languages by 20 situations such as bus stops, hotels, police stations, and so on.
Original text	Displays original language sentences of contextual dialogue such as English, Japanese, Chinese, French, and so on.
Commentary text	Displays an original language sentence, a pronunciation sentence, and an interpretation sentence per each one scene of contextual dialogue.
Supplemental explanation	Displays an additional explanation which is suitable in each contextual situation.

For the purpose of overcoming the limitations of existing contents that users listen and study unilaterally, we develop the main screen of linguistic contents in order to users can control contents as they want yourself. First, to do this, a contextual dialogue is divided into several sentences as a base unit. In the main screen of contents, then, various functions are implemented to control each sentence easily by users like as follows.

TABLE 5.
AREA FUNCTIONS OF LINGUISTIC CONTENTS

Area	Icon/Button	Function
Commentary text		Open/Close commentary text area
		Open/Close original language sentence
		Open/Close pronunciation Sentence
		Open/Close translation sentence in Korean
Original text area		Open/Close original language text area
Supplemental explanation area		Open/Close supplemental Description

In the main screen of linguistic contents, users can choice all playing or playing by one scene. If users select all playing screen, all scenes of the linguistic content should be opened sequentially at once in screen. Fig. 6 shows all playing of contextual content in case of bus inside situation.

Fig. 6. All playing in linguistic contents.

During and after the all playing, users can control contents using functions such as stop, pause, play, all playing or playing by one scene. Table 6 shows functions that operate animations of contextual dialogue.

TABLE 6.
OPERATION FUNCTIONS IN ANIMATIONS

Icon/Button	Function
	Stop
	Play previous/next
	Replay
	All playing/Playing by one scene

4.2 Playing by one scene in contextual dialogue

If users choice playing by one scene in the main screen, the beginning scene of the corresponding dialogue comes in sight. Whenever click on the next button continuously, the next scene of dialogue should be appeared. Similar to all playing, users can select stop, replay, prev/next, all playing or playing by one scene.

Fig. 7. Playing by one scene in linguistic contents.

4.3 Additional functions in linguistic contents

Fig. 8 shows status that users took several additional functions related to learning contents in playing by one scene. In detail, original text area is closed. In commentary text area, opened original language and interpretation sentence, but closed pronunciation sentence. Also, a supplementary explanation appropriated to the situational dialogue is shown in additional explanation area.

Fig. 8. Selection of additional functions.

IV. CONCLUSIONS

As widespread the use of internet increasingly according to the advancement of information and communication technology, educational contents in on-line environments have been continue to grow. However, most existing contents may be limited to a particular foreign language. Thus, it is impossible to learn various foreign languages simultaneously in the existing contents. Also, because existing contents are placed too much emphasis on grammar and vocabulary, users can't learn essential expressions applied to real-life situations.

To solve these problems, in this paper, we developed linguistic contents for studying essential expressions applied to various situations of real life as educational contents. In detail, the linguistic contents are run on web environments, and have valuable multimedia for learning essential expressions based on several foreign languages in contextual dialogues. To learn foreign languages easily and funny, contents are made up animations, voices and texts such as the original language sentence. Therefore, users should improve their foreign language abilities using our contents. Consequently, this is what our contents are differentiated from other existing contents.

REFERENCES

[1] J.-Y. Kim, A Study of Developing and Applying Learning Contents Models to Cyber Home Study, Korea University of Education, 2006.

[2] M.-S. Kim, E.-H. Wee, A Research Regarding the Application and Development of Web Contents Data in Home Economics, Journal of Korean Home Economics Education Associations, vol. 18, no. 1, pp. 49~64, 2006.

[3] M.-H. Ryu, and Y.-A. Sung, Research on e-Book contents development with analogue emotional design applied, Brand Design Association of Korea, vol. 5, no. 1, pp. 75~90, 2006.

[4] M.-Y. Kim, K.-A. Kim, E.-H. Wee, ICT Utilization and Recognition by Home Economics Teachers in Secondary schools, Journal of Korean Home Economics Education Associations, vol. 16, no. 3, pp. 63~80, 2004.

[5] M.-J. Park, Development of a Web Based Learning Environment for Problem Solving using ICT in Home Economics Education, Journal of Korean Home Economics Education Associations, vol. 40, no. 7, 2002.

[6] Juniver foreign language studying(http://www.jr.naver.com /rosettaworld)

[7] Junier English school(http://www.jr.naver.com/ english)

[8] JaenengEdu.com(http://www.jei-edu. com)

[9] Media English Animation(http://www.bridgeedu.co. kr)

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