

# Network of Technology and Web-based Digital Media Resources

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## Abstract

Multimedia contents have been utilised as an effective media tool and web-based digital media has been digitalized and integrated into the web for the sake of the development of information technique. This study is about effective multimedia tools and software which can be applied to English by means of exploring multimedia courseware. The first purpose of the research is to compare the various existing network system of technology for application using multimedia resources. The second is to develop digital models and construction based on multimedia approach. The third is to analyse the results of the survey performed by 80 local students in A City, Korea. The groups of 80 students were divided into the two groups of target and control based on the preliminary tests. This evaluation is to show the effectiveness of the application of multimedia tools as well as the network of the technology and web-based digital media. The survey includes 30 questionnaires about the frequency of multimedia application to survey the impact on study attitudes of students, and to evaluate the effectiveness of self-study by using multimedia approach and tools.

**Keywords:** Multimedia Courseware, Multimedia Tools, Software, Technology, Web-based Media

## 1. Introduction

Multimedia may be said to be the combination of computer software and hardware using videos, animation, audio, and graphic to develop effective presentations. Though multimedia education has been accepted without considering the contents, they have been utilised merely as a means of assistance. The urgent problem a teacher should solve using the modern information technique is not the grammar, but the language which can be actually applied during the application<sup>1</sup>. Thanks to the powerful functions of multimedia tools, the method of multimedia application has gained a lot of advantages such as the assembly of module way, intelligence, and networking<sup>2</sup>. The interactive function and intelligence of multimedia can be an effective method for a student who is passive in

debate. Students can communicate with the real teacher who is designated in the computer through the powerful function of multimedia. At the same time, the teacher can correct the students' mistakes with the help of computer software, which can improve their communication through this kind of class. A teacher can conduct quality tasks with effectiveness and can create a dynamic learning in terms of the various internet tools. What we are asked is to explore the educational method of multimedia. English based on network environment has network advantage. It can strengthen the interests and motivation of the students who would like to study by themselves<sup>3</sup>. It can also improve the students' English speaking and listening skills<sup>4</sup>. In short, as the method of multimedia education is carried out based on the assistance of tools and technique of multimedia, the lesson plans can also be

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formulated accordingly. The purpose of learning can be achieved by using the technique of modern multimedia. This study explores the courseware of multimedia which is designed to integrate of the four functions of language such as text resource presentation and vocabulary learning. The realisation of courseware can be acquired with basic computer skills. The software such as power point, Cocktale 98, and Widas Authoring Suite has been introduced to create the production of learning resources. The last aim of this study is to analyse the responses of students using a survey form which contains more than 30 questionnaires for using multimedia tools.

## 2. Network of Digital Tools

### 2.1 The Interaction of Media Tools

English education using multimedia tools combined with hardware and software makes it possible to utilise the facilities of intelligent learning<sup>5</sup>. The introduction of multimedia has been seriously designed so as to combine the best qualities of several media techniques for it cannot replace the teacher's place.

The design of the multimedia educational program makes it possible to change some of them for a new environment. Multimedia can offer a better way for students to experience various approaches in the class<sup>6</sup>. As shown in Figure 1, the key point is to offer graphic, video, and audio contents at the same time rather than consecutive presentations of multimedia tools.



Figure 1. The presentation of digital media.

For example, students may acquire contextual information on animals by using multimedia which can be interactive. They can even copy the pictures of the muscle structures and skeletons, or compare them with other animals. They can have access to a web site to get more

information and add the picture clip about the animal's natural habit. This means they can create their own ways to communicate from their unique point of views by inserting these kinds of resources in their reports.

### 2.2 Web-based Digital Media

The existing contents of multimedia are getting digitalised and are being combined according to the development of information, which may result from the utilisation of educational media to the learner and the teacher<sup>7</sup>. Figure 2 illustrates the application of the web-based digital media. The class rooms are to be equipped with some software related to the following apparatus for the learning of web-based digital media of ubiquitous education<sup>8</sup>.

*Composition of equipment:* LCD projector, tablet monitor, desktop computer, wireless microphone, wire mike, speaker, electronic table, amplifier, lecture contents (software), digital media software.

### 2.3 The Variety and Description of Media Files

GIF file is a type for downsizing the volume of image by decreasing the number of color. When stored, they can make color index by extracting the color of 256 different types which are mostly used and to express the whole image with the extracted colors.



Figure 2. Web-based digital Media.

The variety of sound files can be described as follows:

#### 2.3.1 Sound Files

- a) WAVE [.wav] Micro soft window basic file format, window recorder, wav file.

- b) MIDI [.mid] Digital music specification/electronic instruments, music international standard, small file capacity, convenient for edition and record.
- c) Music files developed by RA [.ra, .ram] RA (Real Audio). RA and RAM is popular for sound transmission plug in.
- d) Audio file which is compressed with the standard of MPEG Audio [.mp3] MPEG. Realisation of high quality of sound with the capacity of a tenth part.
- e) The abbreviation of WMA [.wma] Window Media Audio. A type of Microsoft file. The compression rate is better than mp3. Popular with a small capacity and best rate of compression.

### 2.3.2 The Types of Video Files

- a) AVI file: AVI file was introduced through Video for Windows 1.0 at the age of window 3.1. The standard file of AVI (Audio Video Interleaved) for window multimedia.
- b) MPEG file: The meaning of MPEG is "Moving Picture Experts Group". MP4 and popular with the quality of clear picture.
- c) ASF and WMVV file: Characteristics with great rate of compression and steaming on internet.
- d) MOV file: The video file was created by Macintosh with the video format. The utility which can be seen on window is 'Quick Time Movie'.

Continuous communication with a learner can be the only way to solve the weak points of web-based digital media and the development of information technique may help both student and teacher easier to communicate with each other<sup>9</sup>.

## 3. Technology and Software

### 3.1 Software and Media Tools

Educational software is becoming a part of the integration of educational multimedia tools which are used by almost all students<sup>10</sup>. For example, the game software, VeGame, was created by the researchers of Genova University, which is to explore the arts and histories of the city of Venice<sup>11</sup>. The purpose of the game was designed to make it a pleasant and challenging experience to visit the city of Venice.

The game of Venice is played on the hand microcomputer guiding the crucial arts and historical

places through the context of treasure hunting<sup>12</sup>. This game is composed of a series of mini games which is necessary to visit an important historical place such as a square, church or museum. This game is to offer a map of the city and some information on places where a visitor is placed. This kind of interaction with the software is very simple, but natural.

Since the software, from the educational point of view, provides some motivation through constructive education which can interact with the environment, this game leads a visitor to observe a historical place and to get useful information playing the puzzle game<sup>13</sup>. The nature of software game is not only for a game, but a useful information and investigation on a particular city for a visitor.

This sort of game set is composed of flash animation and java program language. The effectiveness of this software can be achieved only through the mutual interaction between the user and the right utilisation of multimedia. This offers self-study motivation and personalized learning style with interests<sup>14</sup>. The list of the technical tools to write online<sup>15</sup> is as follows.

#### 3.1.1 To publish the Writing Online

- a) Google Docs: Free Google account. Create documents, presentations, spreadsheets, form or drawing. Organise into folders, publish to the web and share documents with other users. Supports existing document upload (word & powerpoint).
- b) Issuu: Free account allows for document uploads that can be embedded. Embedded presentation is in a flipbook style where documents pages can be flipped and read easily. Example: Emmett Till Lesson Plan
- c) Yudu: Free account allows for pdf uploads that can be embedded very similar to issuu. Example: How to do 11 Techy Things in the New School Year.
- d) Scribd: Free account allows pdf upload. New feature allows Google Documents to be directly uploaded within your scribd account. Scribd files can then be embedded. Example: 10,000 Hour Rule Lesson.
- e) Calameo: Free account. Similar to issuu and scribd, but allows word as well as pdf upload. Embed code provided for uploaded documents.
- f) Docstoc: Free account allows pdf, word, spreadsheet and powerpoint uploads. Uploaded documents are given embed code.

### 3.1.2 Real Time and Online Discussion

- a) Today's Meet: Free tool allows chat rooms to be created instantly. Rooms can be named, given specific time frame, include twitter # discussions. Quick and easy set up, but rooms are public. Try Chatzy if you need privacy.
- b) Chatzy: Free tool allows chat rooms to be created quickly. Features Include: Quick chat: invite people to join via email. Virtual Rooms: password protected.
- c) Google moderator: Students can post questions or comments to the moderated discussion. Once comments are posted, students can "vote" for the idea, or comment on a post. Comments can then be sorted based on the number of votes it received, and can be posted anonymously or require a Google account. Example: What did you do this summer?

### 3.2 The Direction and Necessity of Contents Development

It is necessary to explore the program which can be used in the various environments due to the rapid development of Web technique<sup>16</sup>. This program is to be equipped with the function of sound realisation.

#### 3.2.1 Long Distance Web Program

Web server is to be loaded on the main computer and then is to be accessed from a distant place for an interaction of learning.

Since this program is produced by using the language of JAVA or computer language of HTML, it is different from platform or LAN for personal learning<sup>17</sup>. The only difference is that since the personal learning program cannot be loaded on the Web if the platform is not Web, the web-based program can easily be changed into personal use.

#### 3.2.2 Lan Version

A learner may have access to language learning contents from a computer which has network system of VOD Server in main control room.

Lan Version does not only have an integral media function of multimedia such as video graphic animation, paused screen, sound and hyper link, but also have learning control program which can diagnose and manage the process of learning and education<sup>18</sup>. The LAN and Web Version have been designed to make it possible to operate in the environment of multimedia. The

development of these kind of products are requested to be processed with the joint search ventures of the industries and universities.

## 4. Experiment of Technology and Analysis

### 4.1 Subject of the Survey

This study is to investigate the multimedia tools which can be available for the English writing class based on the value of statistics through the survey of more than 30 questionnaires. This is to analyse the effect of utilising the method of multimedia tools on 120 student subjects who are taking English conversation class at N University located in A city.

**Table 1.** Learner's perception on Multimedia use for improvement

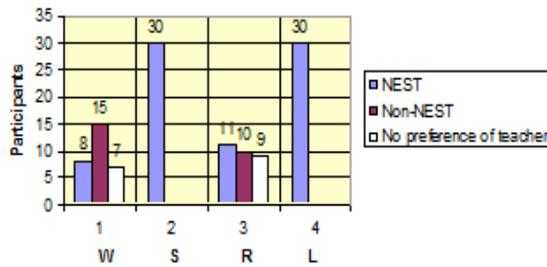
Ranking of skills for improvement		Overall scores in the self-perceived competence of the skills	
Skills	Ranking	Skills	Overall scores
Speaking	1 (80%)	Reading	2.40
Listening	2 (70%)	Speaking	2.30
Writing	3 (43.3%)	Listening	2.27
Reading	4 (50%)	Writing	2.20

The combination of multimedia tools with English learning is shown to be the most effective method of English learning. 120 students were divided into two groups based on the results of pre-test so as to make an average value of two groups similar to each other as much as possible. One is the target group and the other is controlled group.

The results of this survey is derived from the experiment that one group was exposed to learning using multimedia tools, software and technology, the other group was to have the traditional method of English learning. The questionnaire includes some questions such as the attitude of students toward multimedia tools and the effectiveness of multimedia.

### 4.2 Instrument and Data Analysis

The survey method includes more than 30 questionnaires regarding the frequency of multimedia practice, the most effective way of multimedia application, the effective utilisation of multimedia tools, the response of students for introduction of multimedia tools into the class.

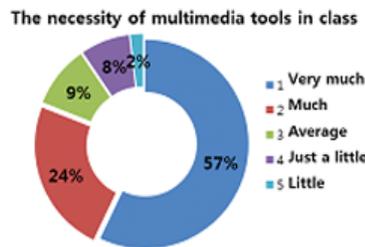


**Figure 3.** Learner's perception on the use of multimedia tools.

\*1) W = writing 2) S = speaking 3) R = reading 4) L = listening

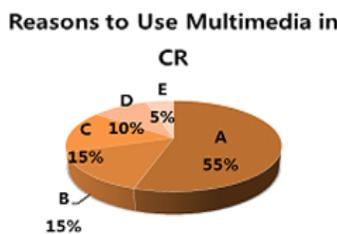
The answers to the questionnaire are composed of 5 levels such as excellent, very good, good, average, or unsatisfactory. The survey has been formulated to determine the necessity and adequacy of multimedia tools to research the information on how the students and teachers respond to the questionnaire.

Figure 4 shows that about 60% students marked (a) very much, which means that they believe that the necessity of multimedia tools in class is absolutely needed. (b) much is answered by 24% students and (c) average is 9%, (d) just a little 8%, (e) little is 2%.



**Figure 4.** The necessity of multimedia tools in class.

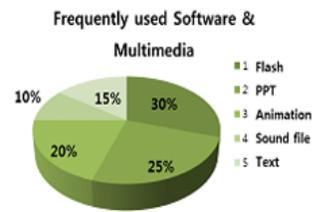
As illustrated in Figure 5, the reason to use multimedia tools, (a) learning effect got 55% answer, (b) motivation and (c) interests had 15% respectively, (d) convenience 10%, and (e) no reason only 5%. This result shows that the purpose of the utilisation of multimedia tools is various.



**Figure 5.** The reason to use multimedia tools.

As shown in Figure 6, 30% for flash, 25% power point

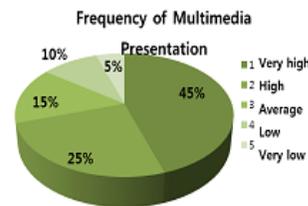
presentation, 20% for animation, 10% for sound file, and 15% for text are frequently used.



**Figure 6.** Software and multimedia frequently used.

The questionnaire shows that 45% for very high of the frequency of multimedia presentation is very high, 25% high, 15% average, 10% low, 5% very low. This means that many of students are using the presentations.

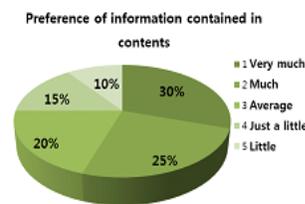
Results from the survey shows that most students are very positive about the utilisation of multimedia tools. 65% students are for excellent, 20% for very good, 10% for good, 4% for average, and 1% for insufficient.



**Figure 7.** Frequency of multimedia presentation.

As shown in Figure 8, the questionnaire asked the participants about the preference for the sort of information contained in multimedia contents, which showed that 30% of the students choose (a) very much, 25% for much, 20% for average, 15% for just a little, and 10% for little.

The result of a questionnaire asking about the understanding of multimedia learning is as follows; 50% for very much, 20% much, 15% average, 10% a little, and 5% little. The percentage over average is more than 85%.



**Figure 8.** Preference of information contained in contents.

From the questionnaire asking about animation application in presentation, 55% of the students are for very effective, 20% for effective, 15% for average, 7% for ineffective, 3% for never effective. This means that the effect of animation in presentation is very positive for the percentage over average is about 90%.

The above questionnaire leads us to be able to draw the conclusion that the multimedia tools, software or video and audio have a great effect on the learning attitude and the achievement of the learning goal.

## 5. Experiment of Technology and Analysis

The effect of multimedia tools influencing the motivation and attitude of a learner is summarised as follows:

### 5.1 A word vs. Picture and Word

Given a word and picture rather than just a word to explain a situation, it gives great help to understand what the situation is like.

A word includes a text, but a picture shows static graphic image, animation, and video. If both a word and picture are shown at the same time, the brain may process much more information. Stories and videos are more effective than a story and text. Similarly, a story and video are much more effective than a simple story and video or text.

### 5.2 The Effect of Multimedia Learning

When a learner focuses on the work, the utilisation of multimedia is more effective. Unless a lesson is concentrated, then it is forced to use the information which is located too far.

If the contents are separated too far from the screen and are not invisible, or when two separated contents are on screen at the same time, then it distracts the learner. Learning is more effective when the related contents are on the screen at the same time. Otherwise, the brain has to work with too much load to integrate the separated information. That means that given both a word and picture is more effective rather than a successive presentation.

### 5.3 Multimedia Contents Presentation

Multimedia learning is more effective when it contains only the related and proper contents for learning. When

the redundancy information and contents are not included, then it gives lesser burden to the learner. Due to the limited capacity to process the information, if the inadequate information is eliminated from the contents, then it works more effectively.

### 5.4 The Activation of a Learner Knowledge Structure

Before a learner can have access to multimedia learning, if the knowledge structure is activated, it is more effective.

It is more effective to construct and activate the information from the multimedia presentation. For example, if a learner is asked to pre-exercise the illustration, debate, and text, then it is possible to activate the learner's brain.

### 5.5 Animation Presentation

If a learner makes animation contents useful in effective ways, then that kind of multimedia learning could be more helpful.

Animation is more effective when a student has to present some concept or information which is difficult to draw with thought. When they have the ability to control the pace, they can have various ways to approach with other multimedia resources.

According to the cognitive law, the recognition and mental activity contains language acquisition, storage, and the use of language. Knowledge is not decided in a passive way but by an attitude, demand, interests, and motivation of a learner. Multimedia learning is requested to make students active and creative to participate in the application.

Successful education is not to make the student's brain filled with certain amount of knowledge, but to provide motivation and interest to study. Multimedia learning aims to combine all kinds of resources to text, sound, animation, graphic, and image in multi-dimensional ways.

## 6. Conclusion

If a student is qualified to have technical ability, then it is easy to acquire the skills of rapid reading, writing and calculation. They are able to explore the technical skills to collect the information based on understanding the nature of internet access and communication.

Technology tends to make students concentrate on the work, which leads them to spend their time studying

and basic learning rather than the traditional learning method. It makes the curriculum suitable for each student and it is designed to develop the individual's potential. Students who are using technology, which is available for the information and technology, have the ability to approach higher standards to handle and apply the multimedia resources. They can access a wider range of information resources and technology, which leads them to use various communication media.

Technology can even improve the passive attitude of the learners; it can motivate students and provide them with an interesting learning environment.

## 7. Acknowledgement

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