Development of Multimedia using Augmented Reality (AR) for Improving Undergraduates' English Listening Skill.

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Abstract

The purposes of this research were to 1) develop the Multimedia using Augmented Reality (AR) for improving undergraduates' English listening skill and study the effectiveness of the developed Multimedia using Augmented Reality (AR) to meet criteria of the efficiency 80/80. 2) compare English listening skill pretest and posttest of undergraduate students and 3) study the satisfaction of the students who learned by the developed Multimedia using Augmented Reality (AR). The sample group was 30 students selected by multistage sampling from undergraduate students in Faculty of Education at Bansomdejchaopraya Rajabhat University in the second semester of 2014 academic year. The research instruments consisted of 1) The Multimedia using Augmented Reality (AR) for improving undergraduates' English listening skill consists 5 conversation, 2) 25 items of English listening skills test, and 3) A satisfaction questionnaire. The research statistics were used in percentage, mean, standard deviation, and t-test.

The results of the research were as follows: The efficiency of the Multimedia using Augmented Reality (AR) for improving undergraduates' English listening skill was 80.44/84.80 which was higher than the assigned criterion of 80/80.The comparison of the undergraduates' English listening skills showed that the posttest scores were higher than the pretest scores with statistically significant difference at the .01 level and the students were satisfied toward Multimedia using Augmented Reality (AR) for improving undergraduates' English listening skill at high level, (= 3.73, S.D. = 0.07). In conclusion, the findings indicate that the Multimedia using Augmented Reality (AR) for improving undergraduates' English listening skill is usable and useful.

Keywords: Multimedia, Augmented Reality (AR), English listening skills

Introduction

ASEAN charter no.34 legislates, "The working language of ASEAN shall be English." Hence, English is the first tool for ASEAN population in communicating with one another and bonding ASEAN regions together. English will be an important standard which leads to learning, training in any disciplines effectively. In preparing graduates to be ready in ASEAN community era, universities need to seek for ways to improve learning and skills to serve graduates' needs. There are two issues to be considered: graduates' occupations and characteristics which ASEAN expect, especially improving English listening, speaking, reading, or writing to reach a satisfactory level. However, it was found from the results of Ordinary National Education Test or O-NET that M.3 and M.6's English averages from 2010 - 2015 are below 50% and tend to be decrease. Furthermore, it was also discovered that the average of listening skill test of 34 3rd-year students who enrolled in English for Educational Technology and Communication for the first semester of 2015 was 14.63 from 40 marks or 36.57%, which is considered rather low. Royal & Khumsri (2010) mention that listening skill is the most important skill which will lead to other skill: speaking, reading, and writing. In order to train and practice learning skill, learners should allow learners to perform learning by doing from Edgar Dale's one of Experience. It was concluded that learners tend to retain 70% from participating learning and retain 90% from learning by doing. Humans learn the best from tangible self-doing. Learning and teaching management, however, should involve students and be based on real situations or actions so as to provide a direct experience to learners (Malithong, 2548). Nowadays, technology plays a role which support learning activities such as computerised teaching aids, A.I teaching system, online lessons. These innovations is a learning environmental management which is broader than an in-class learning-teaching management. It applies and adapts teaching materials to match learners individually. In the present, Augmented Reality (AR) technology is applied to learning and teaching which can stimulate and attract learners. Augmented Reality (AR) technology integrates a surreal world into the real world though 3D representation on a screen and through a digital camera of a tablet, a smartphone, or other devices for a real-time broadcast. The results of the study which applied AR technology to teaching reveals that the AR technology was significantly different from other teaching materials. It attracted learners, made learning enjoyable, interesting, and led to better learning (Thananuwongse,2015). As mentioned above, the researcher has developed a multimedia by using AR technology for improving listening skill of undergraduates. This study would be an important guideline to develop other teaching materials in improving Thai students' other skills in the future.

Purposes

1. To develop a multimedia using Augmented Reality (AR) technology for improving undergraduates' English listening skill to meet the criteria of the efficacy 80/80.

2. To compare the undergraduates' English listening skill before and after learning with a multime-dia using Augmented Reality (AR) technology.

3. To study undergraduates' satisfaction towards the multimedia using Augmented Reality (AR) technology for improving their English listening skill.

Hypothesis

1. The multimedia using Augmented Reality (AR) technology for improving undergraduates' English listening skill meet the criteria of the efficacy 80/80.

2. Students who learn with the multimedia using Augmented Reality (AR) technology improve their English listening skill.

3. Students very satisfy with the multimedia using Augmented Reality (AR) technology for improving undergraduates' English listening skill.

Benefit of Research

1. The developed multimedia facilitates in managing English-skill learning and teaching without using a sound lab. This would solve a problem in having insufficient sound labs and learners can access and practice their listening skill through this developed multimedia anytime and anywhere.

2. Students have an opportunity in improving their English listening skill after class and review any lessons anytime.

3. The researcher develop this multimedia to be an e-learning teaching material for improving English listening skill which is part of English for Educational Technology and Communication course for undergraduates in Educational Technology and communication, Faculty of Education, Bansomdejchaopraya Rajabhat University.

4. This can be used to be a guideline in developing teaching materials for improving other skills of undergraduates to be ready for ASEAN community in the aspect of having a learning community and exchanging and sharing knowledge with neighboring counties in ASEAN.

Research Process

This study is an experimental research. The details of the research process are as follows.

Population and Sample

1. The population in this study was 3rd-year undergraduates of Faculty of Education at Bansomdejchaopraya Rajabhat University who enrolled in the second semester of year 2014.

2. The sample group in this study was thirty 3rd-year undergraduates of Faculty of Education at Bansondejchaopraya Rajabhat University. They voluntarily participated. They, then, were randomly divided into 3 groups, 10 students each, according to their English proficiency, namely, high, moderate, and low, from their grade report in English for Communication course.

Content in the Research

The content in the research was situations related to everyday life, focusing on using simple English vocabulary. The situations for developing this to be the multimedia in improving learners' English listening skill were divided into 5 situations. The situations were 1) Ordering Food, 2) Giving Directions, 3) Describing People, 4) Travel Guide, and 5) Talking about Technology

Instruments

1. The multimedia by using 5 situation Augmented Reality (AR) technology

2. The 25-item multiple-choice exam for measuring listening skill in 5 situations, 5 items each.

3. The 30-item satisfactory evaluation of learners towards the multimedia Augmented Reality (AR) technology, divided into 6 parts: 1) Presentation, 2) Media content presentation, 3)

Language Use, 4) Production Technique, 5) Advantages from the media, and 6) English listening skill from the media

The development of the multimedia

The multimedia using Augmented Reality (AR) technology was developed according to ADDIE pattern (Tienthong, 2002). and develop learning and teaching by Roderic ADDIE is the system which is used to design Sims of University of Technology Sydney adopted and developed computerized lesson steps due to the most inclusive process. Importantly, ADDIE is a Close Loop System which there is a feedback submitted to each step. So, the input can be modified if there is any bad result in each step. The development can be divided into 5 steps: 1) Analysis, 2) Design, 3) Development, 4) Implementation, and 5) Evaluation

The steps in developing the multimedia using Augmented Reality (AR) technology for improving undergraduates' English listening skill is shown in Figure 1.

From Figure 1, the researcher developed the multimedia according to ADDIE model development:

1. Analysis proceeded by:

1.1 The need analysis : The management in learning and teaching of 1010301 English for

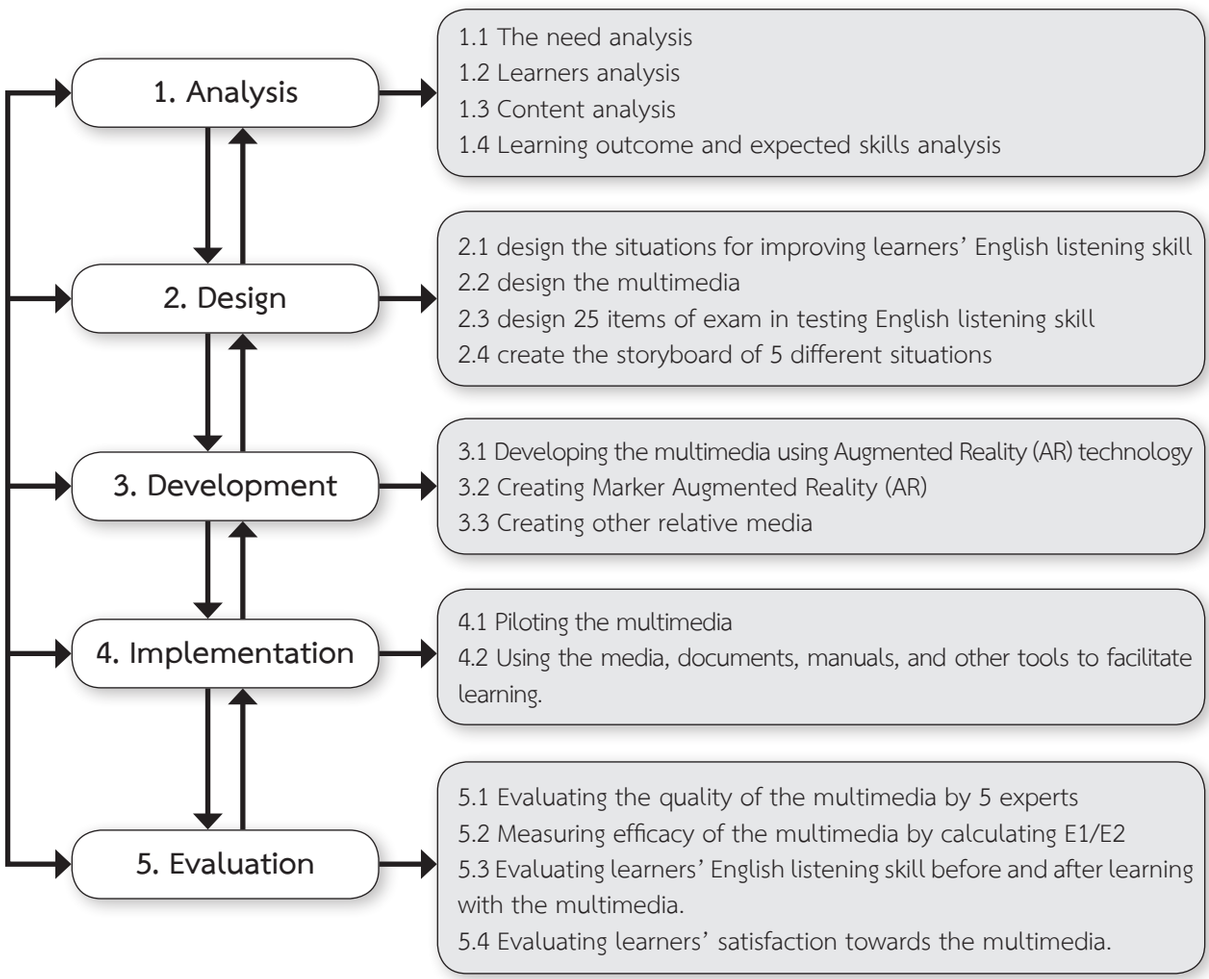

Figure 1 The steps in developing the multimedia using Augmented Reality (AR) technology

Educational Technology and Communications has lacked of effective teaching material in improving learners' English skills.

1.2 Learners analysis: The learners were undergraduates in Educational Technology and Communications major of the Faculty of Education at Bansomdejchaopraya Rajabhat University It was found from the English listening skill test that undergraduates' listening skill basic was rather low, 14.63 in average from 40 marks (36.57%).

1.3 Content analysis : Undergraduates are required to practice English reading, speaking, listening, and writing skills in 1010301: English for Educational Technology and Communications.

1.4 Learning outcome and expected skills analysis : Undergraduates possess English listening skill from the provided situations.

2. Design was performed by:

2.1 Five everyday situations focusing on using simple English vocabulary for improving learners' English listening skill were designed: 1) Ordering Food 2) Giving Directions 3) Describing People 4) Travel Guide 5) Talking about Technology

2.2 The multimedia using Augmented Reality(AR) technology was designed from Aurasma program.

2.3 25 items of the 4-item multiple-choice exam in testing English listening skill was designed.

2.4 The storyboard of 5 different situations was created.

3. Development was done by:

3.1 Developing the multimedia by using commercial 3D motion creation program and presenting the material using Augmented Reality (AR) technology from Aurasma program. Picture preparation and narration in each situation were recorded by using Flash program.

3.2 Creating Marker Augmented Reality (AR) in order to interconnect all 5 situations.

3.3 Creating other relative media such as the answer description.

4. Implementation was operated by:

4.1 Piloting the multimedia

4.1.1 Undergraduates performed English listening skill pretest.

4.1.2 Practicing English listening skill from 5 situations of the multimedia using Augmented Reality (AR) technology.

4.1.3 Undergraduates performed English listening skill post-test and completed the 30-item satisfactory evaluation.

4.1.4 Analyzing the data

4.2 Using the media, documents, manuals, and other tools to facilitate learning.

5. Evaluation proceeded by:

5.1 Evaluating the quality of the multimedia by 5 experts in contents and technique.

5.2 Measuring efficacy of the multimedia by calculating E1/E2 from:

5.2.1 One to One Evaluation from undergraduates who have high, moderate, and low English proficiency.

5.2.2 Small-Group Evaluation from 6 undergraduates who have high, moderate, and low English proficiency.

5.2.3 Field- Evaluation from 30 undergraduates who have high,moderate, and low English proficiency.

5.3 Evaluating learners' English listening skill before and after learning with the multimedia.

5.4 Evaluating learners' satisfaction towards the multimedia.

Processes in performing the multimedia using Augmented Reality technology

Picture scanning via App

1. Signing up before registering “Aurasma” bygoing tohttp://studio.aurasma.com/register

2. Downloading 2 applications to a smartphone or a tablet:

2.1 Aurasmas application for scanning pictures or Trigger images in order to display ani-mated pictures or 3D.

2.2 Scan OR code application for converting Trigger in Aurasmas into OR code.

3. The applications can be downloaded on App Store and Play Store for iOS and Android operating systems, respectively.

4. Searching and selecting pictures from http://www.aurasma.com/campaigns/ from the devices.

5. Opening the “Aurasma” application on iPad, iPhone or Android.

6. Capturing a photo in the media example and waiting until the photo moves, a sound or a video will activated.

7. The scanning can be done on a computer screen, a smartphone screen, a projector, or other devices. For more convenience, Trigger images can be printed out in color or black & white on a paper and using a smartphone, a tablet, or other devices scan the trigger images of de-sired media. Those media, then, will appear on the screen of the device.

Figures 2 – 6 are examples of the multimedia which are assigned to be Trigger Images of 5 situations. When scanning them, the multimedia will appear on the screen of the device.

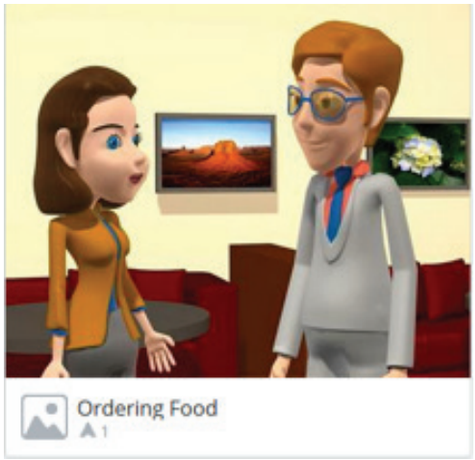

Figure 2 situation 1: Ordering Food

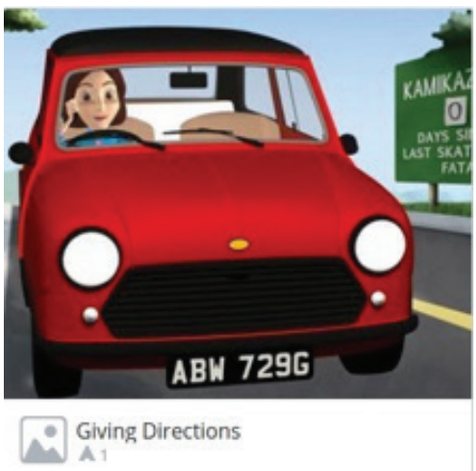

Figure 3 situation 2 : Giving Directions

Figure 5 situation 4 Travel Guide

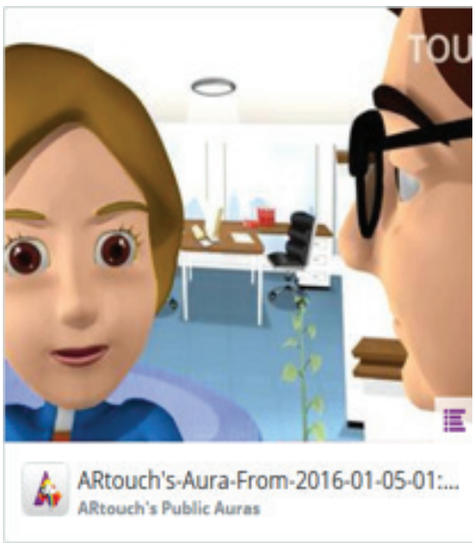

Figure 6 situation 5 Talking about Technology

Data Analysis

1. Measuring efficacy of the multimedia by using Augmented Reality (AR) technology from a correlation between scores between lessons and post-test scores. These scores, then, were coverted into 100% and were compared to find the efficacy according to the criteria of the efficacy 80/80.

2. Comparing a difference between undergraduates' English listening pre- and post- learning scores by setting dependent t-test value at .05.

3. Evaluating undergraduates' satisfaction towards learning though the multimedia using Augmented Reality (AR) technology by using average and standard deviation(S.D.).

Conclusion

1. The results from the development of the multimedia using Augmented Reality (AR) technology for improving undergraduates' English listening skill consisted of 5 situations: 1) Ordering Food 2) Giving Directions 3) Describing People 4) Travel Guide 5) Talking about Technology. The evaluative results from technical experts show that descriptions should be added in order to help learners learn by themselves. The loudness and clearness of the sounds should also modified. Additaionally, the pictures which were used as markers should represent the contents of each lesson.

The efficacy of the multimedia using Augmented Reality (AR) technology for improving undergraduates' English listening skill after testing with the sample group, 30 paarticipants, is shown in Table 1.

Table 1: Efficacy of the multimedia using AR technology according to the criteria of the efficacy 80/80

Standard	Average	Effective Value
E1 (Full score: 30)	24.13	80.44
E2 (Full score: 25)	21.20	84.80

It can be concluded from Table 1 that the multimedia using Augmented Reality (AR) technology for improving undergraduates' English listening skill has efficacy E1/E2 at 80.44/84.80 which are correlated to the criteria of the efficacy 80/80.

2. Comparing pre-and post-learning English listening skills When the pre- and post-test scores were compared by using t-test, it was found that the post-test scores were higher than those of the pre-test with the statistic significance at .01 as shown in Table 2.

Table 2: The results of the comparison between pre- and post-test scores of English listening skills

English Listening Skills	$\bar{x}$	S.D.	df	t-test
Before Learning	15.47	4.34	29	6.52
After Learning	21.20	1.82		

**statistically significant at .01

From Table 2, the averages of after and before learning are 21.20 and 15.47, respectively. When the averages were compared, the difference was statistically significant at .01. It can be said that undergraduates' English listening skill after learning was higher than that of before learning.

3. The results of undergraduates' satisfactory towards the multimedia using AR technology are presented in Table 3.

It can be summarized from Table 3 that learners' satisfaction towards the multimedia using Augmented Reality (AR) technology are very satisfied.

Discussions

The development of the multimedia using Augmented Reality (AR) technology for improving undergraduates' English listening skill has the effective average at 80.44/84.20 as expected due to the 5-step systematic development: 1) Analysis, 2) Design, 3) Development, 4) Impleme-tation,and 5) Evaluation. The important factors which result in learning effectively are the design which facilitates learning by providing learners flexibility, tangible media which are attractive and intriguing by using the efficacy of Augmented Reality (AR) technology for accessing the media easily and through the experiment in an actual class. The media were piloted and revised 3 times. Undergraduates' opinions towards the multimedia from the interview and through the observation show that learners were enthusiastic and paid attention well in lessons because they learned from novel media which contain still pictures, graphics, animated pictures, sounds, colors of a screen, alphabetical colors. The contents of the lessons were also easy to access and leave and learners could learn according to their abilities and proficiencies. These are congruent with Alessi and Trollip's (1991), Pattanasiri's (1996), and Malithong's (2005) ideas in designing teaching and learning materials: 1) The obvious structure, 2) The ease of use, 3) The well connection, 4) The appropriation fitted in a screen, and 5) The speed. It can be concluded that the development of the multimedia using Augmented Reality (AR) technology can be used in improving undergraduates' English listening skill.

Recommendation

Multimedia can be used in e-learning lessons and integrated with other teaching and learning activities. Moreover, for the easy access to lessons, Trigger images can be printed on paper or other materials in order to be carried around. However,

Table 3: The results of undergraduates' satisfaction towards the multimedia using AR technology

Evaluation lst		SD	Intepretation
1. Presentation	3.50	0.51	Very satisfied
2. Media content presentation	3.60	0.49	Very satisfied
3. Language usage	3.80	0.61	Very satisfied
4. Production technique	3.70	0.46	Very satisfied
5. Advantages from the media	4.00	0.64	Very satisfied
6. English listening skill from the media	3.80	0.61	Very satisfied
Total	**3.73**	**0.07**	**Very satisfied**

there is a shortcoming as it is required the internet connection.

Recommendations for further research

1. Materials which are used with Augmented Reality (AR) technology should be developed in order to be easy to access, cheap, and facilitate learning or improve learners' other skills.

2. The multimedia using Augmented Reality (AR) technology should be developed to be used with games so as to improve learners' other skills in different levels.

Acknowledgements

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