Leveraging the Features of Multimedia Technologies in Enhancing Vocabulary Learning

Md. Shahdat Hossain Munna [*]

Abstract: Nowadays, the use of technology has become essentially important in language learning. In addition, language teachers must possess a technological toolkit of applications, websites, and multimedia applications that can help save time and provide variability and flexibility to engage learners with any material that they study. This study aims to provide innovative methods for learning English vocabulary by leveraging the features and advantages of multimedia technologies. The different tools and technologies will be presented to enable effective vocabulary development for learners and equip teachers with high-level assistive technologies.

1.   Introduction

Over the past decades, expanding students' vocabulary increasingly become essential, thus, significant advancements in the teaching and learning of English vocabulary using multimedia [1][2]. With the rise of technology, educational institutions are continuously redefining language learning standards to incorporate technology into the classroom, which has been noted for enhancing interactive, creative, problem-solving, speaking, writing, listening, and reading skills [3][4]. Among these skills, vocabulary is crucial. The use of technology in language classrooms has been found to improve students' achievement, engagement, and overall participation in language learning [5][6][7]. In the studies of Harnad [8] and Warschauer [9], they have compared the digital experiences of today's students to the paradigm shift brought about by the prevalence of new technologies; these technologies significantly influence students' language learning preferences and consistently shift epistemological frameworks. Since the integration of technology into classrooms, various strategies for teaching and learning vocabulary have emerged.

As Milton [10] suggests, the term "word" is used for simplicity, but it encompasses various complex meanings such as types, tokens, lemmas, and word families. Krashen [11] emphasizes the importance of vocabulary, seeing it as a key indicator of language proficiency since learners often rely on dictionaries rather than grammar books. Vocabulary is crucial in laying the foundation for the development of other language skills within the components of vocabulary, grammar, and phonology.

[*] Multimedia Engineering Department, Hannam University, Daejeon, South Korea
Email: utopia.munna@gmail.com (Corresponding Author)

Although vocabulary seems straightforward, defining it precisely is challenging; it encompasses multiple characteristics, and there is no single definition that captures them all.

Various lexicons offer different definitions of vocabulary, though some share common traits. Oxford Advanced Learner's Dictionary Online defines vocabulary as: (1) All the words an individual knows or uses; (2) All the words in a particular language; (3) The words people use when discussing a specific topic; and (4) A list of words with their meanings, especially in a book for learning a foreign language. Wilkins [12] also suggested that "without grammar, little can be conveyed", "without vocabulary, nothing can be conveyed". Acquiring extensive vocabulary helps students speak more fluently and persuasively, and a larger vocabulary is essential for achieving high proficiency in a second language. According to Nation, learning vocabulary is the most crucial process in advancing students' knowledge, representing the pathway to gaining command over a second language.

This study suggests that technology catalyzes for transforming language instruction, offering students diverse opportunities to engage with and understand vocabulary in meaningful contexts. By utilizing digital resources such as instructional software, online platforms, and multimedia materials, teachers can tailor their lessons to accommodate various learning styles and preferences, fostering a more personalized and inclusive approach to vocabulary development. Furthermore, the integration of technology enriches language learning experiences by providing interactive simulations, virtual interactions, and multimedia projects, enabling students to apply their vocabulary knowledge in real-world scenarios. With technology integrated into language classrooms, teachers can prepare the next generation of language learners with the linguistic flexibility and cultural awareness needed to thrive in an increasingly interconnected global society.

The rest of this paper is organized as follows: Section 2 discusses an overview of multimedia and its application to vocabulary learning; Section 3 identifies the various multimedia technologies that can be used for vocabulary learning; and Section 4 concludes the study.

2. Multimedia Technology

The concept of multimedia refers to the integration of various media, combining "many" and "media". Media serves as the carrier and expression of people's transmission of information. According to global standards, media can be categorized into: (1) sensory media; (2) presentation media; (3) display media; (4) storage media; (5) communication media. Each medium has its unique way and function of information transmission, and there is a relatively close relationship between them. Nowadays, the dissemination of information has evolved from the single transmission format of sound, images, and pictures into an efficient, precise, and convenient multimedia model for transmitting information. Figure 1 shows a range of multimedia examples that encompass diverse forms of communication and entertainment.

Characteristics of multimedia include:

1. Diversity: Diversity refers to the enrichment and multidimensionality in the transmission of information through multimedia technology.

2. Interactivity: Interactivity represents the ability to conduct interactive communication with the audience. Interactivity is designed to give users a better understanding of how to use and control the information, while making it more effective for them.

3. Integration: Integration encompasses two aspects: the integration of media devices and the integration of audiovisual information.

4. Real-time: Real-time means that audio, video, animation, etc., in multimedia are all connected to each other to make the audience feel consistent in their perceptions.

5. High quality: Multimedia technology based on digitization can ensure the high quality and accuracy of information transmission.

Figure 1. Multimedia Examples that Encompass Diverse Forms of Communication and Entertainment [13]

2.1 Utilization of sight and sound

Since the 1980s, developed nations like England and the US have been integrating media technology into education, enhancing students' interest in learning through the use of audio, video, text, slides, and other materials [14]. With the advancement of computer technology, the popularity of using computers to deliver multimedia courseware has increased, continually improving the production of multimedia materials to create engaging and practical content [15]. Multimedia electronic publications such as audio dictionaries and encyclopedias are also common applications of multimedia. The use of multimedia extends even to computer entertainment, including games and movies. Moreover, a broad vocabulary is essential for effective speaking, listening, reading, and writing, serving as a fundamental component of a comprehensive K-12 education system and playing a significant role in the Common Core State Standards.

In today's 21st-century classrooms, there's a harmonious integration of advanced technology alongside traditional tools. Online resources have emerged as invaluable fonts of information regarding word meanings, surpassing the capacities of conventional resources. Additionally, specific tools empower educators to customize word materials, facilitating student engagement through practice, review, and subject-specific vocabulary activities. The advent of Computer-Aided Language Learning and Teaching (CALL and CALT) has prompted a significant shift among English educators, moving away from teacher-centered or textbook-dependent instruction towards more student-centered or classroom-centric approaches [16]. Harnessing the potential of new information technology, language instructors seamlessly integrate computers and the Internet into their teaching methodologies. CALL and CALT are widely recognized as the vanguard of innovation in foreign or second language education and learning. Educationally, the integration of computers and the Internet promotes a student-centric

learning paradigm, diminishing the traditional centrality of the teacher in the learning process [17]. Consequently, many universities now equip non-English major undergraduates with language labs and multimedia facilities. The embrace of open methodologies underscores the recognition that learning vocabulary extends beyond rote memorization and repetition; it involves a spectrum of activities aimed at enhancing comprehension and usage. Presently, CALL and CALT have evolved from conventional to online platforms, incorporating advanced features such as hypertext, hypermedia, and multimedia. Hypertext refers to interconnected links among textual elements, typically indicated by keywords displayed in underlined blue text. On the other hand, hypermedia is also similar as those links used in hypertext, however, instead of merely connecting texts, it also involves linking various media types, such as audio, images, animation, and/or videos. Sight and sound alludes to a considerable lot of similar thoughts related with hypermedia, yet hypermedia may just utilize two kinds of media (for example text+sound or text+photographs).

Interactive media encompasses various types of media such as text, images, audio, video, and animations. It can significantly enhance students' vocabulary acquisition by fostering their independent learning abilities. Additionally, it reduces students' dependency on instructor-centered approaches in the classroom. Hoogeveen [18] highlighted several benefits of multimedia in language learning. Firstly, students engage with the media in a multifaceted manner, experiencing information rather than merely absorbing it. Secondly, the interaction with multimedia is perceived as more user-friendly. Thirdly, students derive enjoyment from multimedia, turning learning into a pleasurable process. Vocabulary learning is a fundamental aspect of language acquisition. However, Chinese students studying English often face challenges due to limited vocabulary and proficiency. Enhancing vocabulary acquisition requires concerted efforts from multiple perspectives, including teacher support and students' development of effective learning strategies. Computer-Aided Language Learning (CALL) and Teaching (CALT) practices contribute positively to students' autonomy in language learning. Through the integration of audio, visual, and interactive elements, language learners are stimulated to engage actively in vocabulary acquisition. Multimedia materials encourage student interaction more frequently than traditional classroom settings. Music, films, and computer interactions enable students to learn new words naturally. The ultimate goal of English education is to empower students to develop their own strategies for acquiring, producing, and disseminating knowledge. It's crucial to make students aware of the processes and techniques involved in vocabulary learning so they can develop strategies that suit their learning preferences.

2.2 Relationship between vocabulary knowledge and media

The study of Jackson *et al.* [19] indicates that students who utilize the internet more, tend to achieve higher scores and grades. In addition, Krashen [11] suggests that the internet alters the dynamics between learners and educators, leading to reduced interaction between them and making learning more student-centered. This mode of learning allows students to enhance their vocabulary by watching and listening to dialogues in movies. The advantages of incorporating films into language classrooms are numerous. Movies enhance the ability to comprehend spoken language in various contexts. Students subconsciously absorb language and sentence structures while watching films. They also gain an understanding of new cultures, grasp and adapt to new accents, thereby improving their pronunciation. Movies can be valuable in teaching vocabulary. If instructors aim to provide students with communicative competence, it is quite intriguing to engage them in activities such as phrases, vocabulary exercises to learn new words, and utilizing exercises like Prefixes, Suffixes, compound words, cloze tests, *etc.*, to enhance one's vocabulary proficiency.

Table 1. Extent of Effectiveness of Watching English Movies on Learning English Language

Statements	Weighted Mean	Description
1. It improves my pronunciation.	3.47	VME
2. It improves my intonation.	3.05	ME
3. It improves my grammar.	3.39	VME
4. It improves my spelling.	3.35	VME
5. It improves English vocabulary.	3.11	ME
6. It improves my fluency in speaking.	3.11	ME
7. I learned more literary devices.	2.61	ME
8. It improves my comprehension skills.	2.65	ME
9. It improves my critical thinking.	3.01	ME
10. It develops my imagination.	3.35	VME
11. It helps me discover new things.	3.36	VME
12. It improves my social skills.	3.20	ME
13. It helps me to learn the English language faster than other ways.	3.11	ME
14. It improves my communication skills.	3.35	VME
15. It promotes my understanding about the different cultures.	3.39	VME
Average Weighted Mean	3.17	Much Effective

The findings presented in Table 1 indicate that, overall, student participants perceived the incorporation of movies in the classroom as Much Effective, with an average weighted mean of 3.17.

This suggests that the majority of the participants regarded movies as beneficial for enhancing their English language skills and maintaining their interest [20].

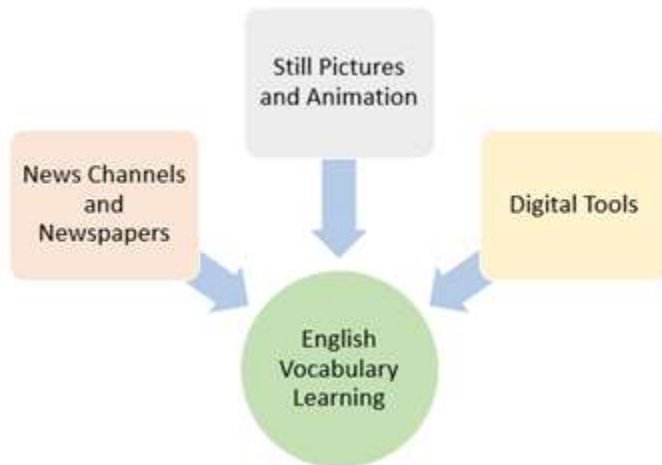## 3. Multimedia Technologies for Vocabulary Learning

Figure 2. Multimedia Technologies for Vocabulary Learning

3.1 Learning through News channels and Newspapers

With the continuous advancement of electronic and print media, the content and programs of news channels and newspapers have become more diverse, sensationalized, and the language used has become more formal, vibrant, and accessible [21]. Some news channels and newspapers are easy to watch, read, and user-friendly. Engaged students can design activities to enhance the following skills: effective communication, grammar, listening, vocabulary, reading comprehension, map/graph reading skills, critical thinking skills, geography skills, writing skills, and social analysis skills.

Figure 3. BBC News Offering Latest Global Headlines and Trends

English news channels and newspapers encompass a wide range of information such as stories, business news, sports updates, feature stories, columns, reviews, opinions, advertisements, entertainment schedules, and more. Students can easily access programs and reading materials of their interest. The primary features of English news channels and newspapers include guidelines for handling breaking news, where channels like BBC (see Figure 3), CNN IBN, and NDTV adhere to specific protocols. In regional news, journalists typically provide a brief summary of the breaking news followed by in-depth analysis. Visual cues are often used to draw viewers' attention to breaking news. Moreover, BBC One and BBC News have replaced individual breakfast news programs with a unified approach, including an hourly business update during weekday schedules, compared across channels.

3.2 Still and Animation

Most studies investigating vocabulary learning through static and animated images compare the retention of vocabulary words when presented using either format. It's commonly theorized in these studies that animation is more effective than still images. However, these investigations have produced varied outcomes, leading to different conclusions. Some studies have demonstrated positive effects of animation [22][23], while other studies have shown negative impacts [24][25]. As a result, there are divergent conclusions regarding the use of still versus animated images. Some conclusions suggest that when using still images, learners interpret and recall the content of the text, remembering vocabulary due to the combination of verbal and pictorial information, especially if the images relate to the test items. On the other hand, conclusions regarding the use of animated images in vocabulary teaching suggest that they are effective when motion is an essential characteristic of the presented concept and serves to signal or draw the viewers' attention to that crucial aspect.

3.3 Digital Tools to Build Vocabulary

Moreover, possessing a rich vocabulary is crucial for effective communication in speaking, listening, reading, and writing. As a comprehensive vocabulary program incorporates both direct and indirect word learning strategies, the following online tools can be seamlessly integrated to facilitate word acquisition [26]. In today's 21st-century classrooms, digital tools must coexist alongside more traditional resources. In comparison to their traditional counterparts, online tools offer a broader range of information about words and their meanings. Additionally, some tools empower educators to customize words easily, enabling students to practice, review, and engage in games with content-specific or unit-specific vocabulary.

Digital tools offer several advantages. For example, many of them allow students to:

- Listen to pronunciations
- Read words in various contextual examples
- View relevant photographs and images associated with words (especially beneficial for English language learners)
- Reinforce word acquisition through interactive games
- Experiment with and manipulate language
- Find rhyming words
- Collaborate with peers to create virtual word walls

The digital tools presented here hold potential to aid in word learning, assessment, and language exploration [27]. They are listed without any particular order, so it's advisable to review the entire list. Just like other digital resources, they vary in quality and effectiveness. Therefore, it's essential to select tools carefully to align with standards and learning objectives.

4. Conclusion

New media technology is widely integrated into teaching various disciplines, serving as a significant breakthrough to foster teaching innovation and transformation. When it comes to utilizing media in the classroom, the role of the teacher is often complex. However, it's essential to recognize that the teacher plays a pivotal role in promoting active learning. Therefore, the teacher remains central in all educational programs facilitated with the aid of the media. In the context of vocabulary instruction in English courses, traditional teaching methods are still predominantly used, resulting in challenges such as reliance on a single teaching approach, lack of interaction in the teaching process, absence of contextualization in vocabulary training, and students' low evaluation of the curriculum. Teachers can employ various strategies to incorporate new media technology into vocabulary instruction. For instance, utilizing micro-lecture videos, creating context, utilizing English learning applications, and exploring and promoting more diverse integration methods based on teaching practice to enhance the practical value of new media technology in vocabulary instruction. Lastly, this paper discusses considerations in the use of new media technology in vocabulary teaching to prevent the formalization of new media technology, ensure teaching effectiveness following its implementation, and enhance the quality of English vocabulary education and learning.

References

[1] M. Warschauer, "*Computer Assisted Language Learning: An Introduction*", in *Multimedia Language Teaching*, S. Fotos (Ed.), Logos International, Tokyo, Japan, 1996, pp. 3-20.

[2] M. Warschauer, D. Healey, "*Computers and Language Learning: An overview*", Language Teaching, vol. 31, no. 2, 1998, pp. 57-71, 1998. doi: 10.1017/S0261444800012970.

[3] D. Lindquist, T. Denning, M. Kelly, R. Malani, W. G. Grisworld, B. Simon, "*Exploring the Potential of Mobile Phones for Active Learning in the Classroom*", in Proceedings of the 38th SIGCSE technical symposium on Computer science education (SIGCSE '07), Association for Computing Machinery, New York, NY, USA, vol. 39, no. 1, March 2007, pp. 384–388, doi: 10.1145/1227310.1227445.

[4] T. C. Liu, H. Y. Wang, J. K. Liang, T. W. Chan, H. W. Ko, J. C. Yang, "*Wireless and Mobile Technologies to Enhance Teaching and Learning*", Journal of Computer Assisted Learning, vol. 19, no. 3, September 2003, pp. 371-382, doi: 10.1046/j.0266-4909.2003.00038.x.

[5] S. Cobb, R. Heaney, O. Corcoran, S. K. Henderson-Begg, "*Using Mobile Phones to Increase Classroom Interaction*", Journal of Educational Multimedia and Hypermedia, vol. 19, no. 2, January 2010, pp. 147-157.

[6] C. Markett, I. Arnedillo Sánchez, S. Weber, B. Tangney, "*Using Short Message Service to Encourage Interactivity in the Classroom*", Computers & Education, vol. 46, no. 3, April 2006, pp. 280-293, doi: 10.1016/j.compedu.2005.11.014.

[7] P. Mthethwa, "*Teaching Vocabulary Using Multimedia: The Case of U.S. International Students*", Global Journal of Foreign Language Teaching, vol. 8, no. 2, June 2018, pp. 68–75, doi: 10.18844/gjflt.v8i2.3190.

[8] S. Harnad, "*Post-Gutenberg Galaxy: The Fourth Revolution in the Means of Production of Knowledge*", Public-Access Computer Systems Review, vol. 2, no. 1, 1991, pp. 39-53, www.eprints.soton.ac.uk/253376/1/harnad91.postgutenberg.html.

[9]   M. Warschauer, "*Technology and Social Inclusion: Rethinking the Digital Divide*", MIT Press, Cambridge, Massachusetts, USA, January 2004, doi: 10.7551/mitpress/6699.001.0001.

[10]   J. Milton, J. Wade, N. Hopkins, "*Aural Word Recognition and Oral Competence in English as a Foreign Language*", in *Insights into Non-Native Vocabulary Teaching and Learning*, R. Chacón-Beltrán, C. Abello-Contesse, M. M. Torreblanca-López (Eds.), Multilingual Matters, 2010, pp. 83-98, doi: 10.21832/9781847692900-007.

[11]   S. D. Krashen, "*Principles and Practice in Second Language Acquisition*", Pergamon Press Inc. Oxford, United Kingdom, 1982, ISBN: 0-08-028628-3.

[12]   D. A. Wilkins, "*Linguistics in Language Teaching*", MIT Press, Cambridge, Massachusetts, USA, 1972, ISBN: 0262230607.

[13]   M. Tariq, "*10 Examples of Multimedia*", Educate Computer, www.educatecomputer.com/examples-of-multimedia/ (Accessed May 10, 2023).

[14]   A. Haleem, M. Javaid, M. A. Qadri, R. Suman, "*Understanding the Role of Digital Technologies in Education: A Review*", Sustainable Operations and Computers, vol. 3, May 2022, pp. 275-285, doi: 10.1016/j.susoc.2022.05.004.

[15]   H. Almarabeh, E. F Amer, A. Sulieman, "*The Effectiveness of Multimedia Learning Tools in Education*," International Journal of Advanced Research in Computer Science and Software Engineering, vol. 5, no. 12, December 2015, pp. 761-764, ISSN: 2277 128X.

[16]   A. Laghos, P. Zaphiris, "*Computer-Aided Language Learning*," in *Encyclopedia of Distance Learning*, 2nd Edition, P. L. Rogers, G. A. Berg, J. V. Boettcher, C. Howard, L. Justice, K. D. Schenk (Eds.), IGI Global, Pennsylvania, USA, January 2009, pp. 374-376, doi: 10.4018/978-1-60566-198-8.ch056.

[17]   S. Chatterjee, A. Sahoo, S. R. Chowdhury, A. Bhattacharjee, "*Computer Assisted Language Teaching*," International Journal of English Learning and Teaching Skills, vol. 1, no. 4, pp. 305-307, 2020. https://www.ijeltsjournal.org/wp-content/uploads/2020/01/48.Computer-Assisted-Language-Teaching-N.pdf, (Accessed: May 12, 2023).

[18]   M. Hoogeveen, "*Toward a Theory of the Effectiveness of Multimedia Systems*", International Journal of Human Computer Interaction, vol. 9, no. 2, June 1997, pp. 151-168, doi: 10.1207/s15327590ijhc0902_4.

[19]   L. A. Jackson, A. von Eye, F. Biocca, G. Barbatsis, Y. Zhao, H. E. Fitzgerald, "*Children's Home Internet Use: Predictors and Psychological, Social and Academic Consequences*", in *Computers, Phones, and the Internet*, R. Kraut, M. Brynin, S. Kiesler (Eds.), Oxford University Press, Oxford, England, 2006, pp. 145-167.

[20]   A. G. Walay, "*Use of English Movies as a Pedagogical Tool in Learning English Language*", International Journal of Arts, Sciences and Education, vol. 3, no. 2, June 2022, pp. 39-56, ISSN: 2799-1091.

[21]   S. Kruikemeier, S. Lecheler, M. M. Boyer, "*Learning from News on Different Media Platforms: An Eye-Tracking Experiment*", Political Communication, vol. 5, no. 1, November 2017, pp. 75-96, doi: 10.1080/10584609.2017.1388310.

[22]   L. P. Rieber, S. C. Tzeng, K. Tribble, "*Discovery Learning, Representation, and Explanation within a Computer-based Simulation: Finding the Right Mix*", Learning and Instruction, vol. 14, no. 3, June 2004, pp. 307-323, doi: 10.1016/j.learninstruc.2004.06.008.

[23]   R. E. Mayer, "Multimedia learning", 3rd Edition, Cambridge University Press, New York, USA, 2020.

[24]   R. E. Mayer, M. Hegarty, S. Mayer, J. Campbell, "*When Static Media Promote Active Learning: Annotated Illustrations versus Narrated Animations in Multimedia Instruction*", Journal of Experimental Psychology: Applied, vol. 11, no. 4, December 2005, pp. 256-265, doi: 10.1037/1076-898X.11.4.256.

[25]   W. Schnotz, H. Grzondiel, "*Individual and Co-operative Learning with Interactive Animated Pictures*", European Journal of Psychology of Education, vol. 14, no. 2, June 1999, pp. 245–265, doi: 10.1007/BF03172968.

[26] C. Bueno-Alastuey, K. Nemeth, Katalin, "*Quizlet and Podcasts: Effects on Vocabulary Acquisition*", Computer Assisted Language Learning, vol. 35, no. 2, 2020, pp. 1-30, doi: 10.1080/09588221.2020.1802601.

[27] B. L. Moorhouse, L. Yan, "*Use of Digital Tools by English Language Schoolteachers*", Education Sciences, vol. 13, no. 3, February 2023, pp. 226, doi: 10.3390/educsci13030226.