

# Multimedia-Based English Language Learning Interventions Programs For Elementary Grades

Syarifa Rafiqa<sup>1</sup>, Endry Boeriswati<sup>2</sup>, Herlina Usman<sup>3</sup>

<sup>1</sup> Assistant Professor, Universitas Negeri Jakarta, Universitas Borneo Tarakan,  
*syarifarafika\_pb18s3@mahasiswa.unj.ac.id / rafiqa@borneo.ac.id*

<sup>2</sup> Professor, Universitas Negeri Jakarta, *endry.boeriswati@unj.ac.id*

<sup>3</sup> Associate Professor, Universitas Negeri Jakarta, *herlina@unj.ac.id*

## Abstract

The immense importance of learning English as an essential skill in modern life has led many researchers to try to find more successful approaches to intervention. Multimedia and technology have been widely used to support and improve English language learning. This analytical review purposes at providing a comprehensive overview of existing research on multimedia-based or multimedia-assisted English language approach for elementary grades, as well as evaluating various aspects of these studies between 2009 and 2019. After extensive research, 31 publications have met the criteria for inclusion. The studies are classified into five reading, writing, speaking, listening and vocabulary categories. It is found that speaking and listening interventions, as well as the use of smartphones, tablet, and other non-computer devices, are ignored in a massive way. This paper provides a comprehensive and thorough overview of the current state of the art in English language approaches to researchers and solution developers. In addition, it discusses the existing gaps in knowledge and establishes avenues for future research to establish successful English language programs.

**Keywords :** Multimedia, Elementary Grades, English Language Learning.

## I. INTRODUCTION

The importance of environments that offer baby and young children many and varied language learning opportunities, in early research (Hart & Risley, 1992) was illuminated. Their analysis delineated patterns of children's early language-learning stimulation and documented disparities within the amount of child-directed speak and therefore the quality of language inter-action that children, however, expected later delayed receptive and communicatory language, writing system and reading performance in early primary school (Walker, Greenwood, & Hart, 2016). Studies indicate that the earliest interactions of children with language have a major impact on vocabulary growth, reading skills and school performance (Rodriguez & Tamis-lemonda, 2011; Rowe, Raudenbush, & Goldin-meadow, 2012; Usman, Maksum, & Sutisna, 2020). Children who have limited experiences with language and literacy can fail or never develop the reading skills, social skills or knowledge of content required for school success (Boeriswati, 2013; Dickinson, Golinkoff, & Hirsh-pasek, 2010). Then proven by research on the links between early language interaction of children with adults and their subsequent language, literacy and social behavior (Burchinal et al., 2011; Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010). Links have also been documented between adult-child language interaction and early neural connectivity of children (Kuhl, 2010; Romeo et al., 2018). These institutions underscore the importance of translating language intervention studies into practice utilized by adults who offer intervention offerings to young children (Walker et al., 2019).

The development of technology and communication is something that needs to be used to make learning activities by using media. Educational developers understand that the use of digital media can make learning more successful. Therefore, increasingly encouraged the development of learning media, as an alternative learning media, computer-based learning media is currently being developed and used. Computer-based learning is how computer programs are used as a tool to deliver learning material (Roblyer & Hughes, 2018). Certain multimedia-relevant systematic reviews focused specifically on computer-assisted language learning (Abraham, 2008), augmented reality learning experiences, which treats the whole experience of the students as the source of learning (Santos et al., 2014), and how signaling affects learning with media (Schneider, Beege, Nebel, & Rey, 2018).

Multimedia technology development has promised great potential to change the way you learn, get information, adjust information, and so on (Saputri & Indriayu, 2018). Multimedia also provides educators opportunities to develop learning strategies to achieve optimal outcomes (Clark & Mayer, 2011). In addition, students can easily determine what content is processed quickly and efficiently in conjure with the standards of multimedia (Minkova, 2016; Wang, 2009; Winarno, Muthu, & Ling, 2018). Learning with multimedia makes it easy for students because

as a source of information, multimedia is no longer based on book-only text, but more generally than that (Leow, 2014; Mantiri, 2014).

This study focuses on the multimedia-based intervention program for elementary grade language learning instruction. The aim of this study is to: (1) Present a comprehensive review of studies that applied multimedia to their language learning program from 2009 until 2019, (2) To provide the foundation on which new researchers and developers in this area can find their content and instructional mechanisms of the program identified, and (3) analyze reviewed studies from different aspects. Thirty-one studies have met the criteria for inclusion and identifying language learning articles based on multimedia.

## II. METHOD

### 2.1 Article Retrieval Scheme Design

Google Scholar and other relevant data bases (ERIC and Science Direct) have been used to conduct this research, and various keywords have been used to find specific papers, such as “multimedia-based” “multimedia learning”, “English learning”, “language learning”, “English intervention program”, “reading intervention program”, “listening intervention program”, “speaking intervention program”, “vocabulary intervention program”, “elementary school”, “primary school” was applied as the search for the targeted articles. After excluding studies that were not (a) match the theme (b) in English (c) published more than once. Based on this study, 145 studies have been identified for further review, 31 of which have met all the requirements for inclusion. This statistics shows a high dispersal of journals in various fields of research, including system, education, neurolinguistics, psychology, computer and social & behavioral studies.

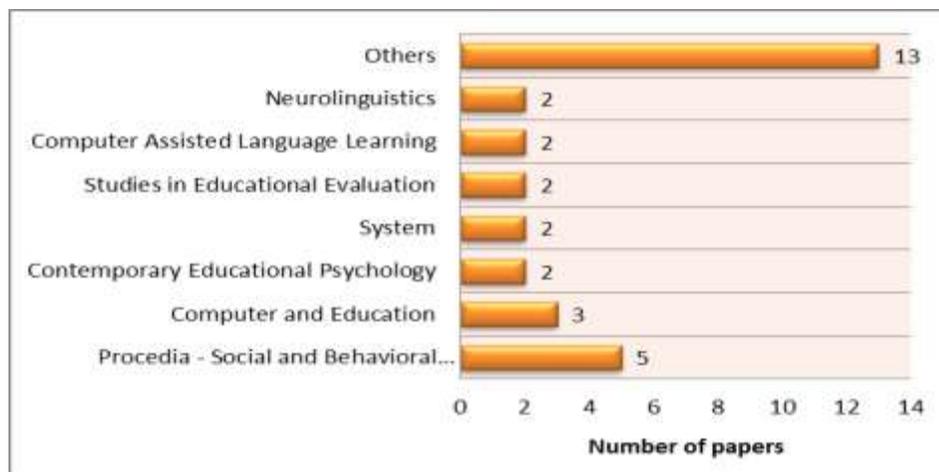


Figure 1. Distribution of sources of the retrieved papers

### 2.1 Article Retrieval Scheme Design

For this analysis the inclusion criteria requirements are; (1) All participants should be in elementary schools or between the ages of 6 until 12 years old. (2) The aim of the intervention should be to develop language skills in general and English skills in particular, in whole or in part. (3) The intervention should be based on or assisted by media or multimedia. (4) The research should involve at least six participants in the intervention. (5) The research should be published between 2009 and 2019.

The publications reviewed and distributed over two years and the last year are summarized in Figure2. This statistic reflects the growing interest in using multimedia to develop elementary students' English language skills. Due to the importance of this issue and the facts that, that over time different multimedia have become more available and ubiquitous for educational purposes, not surprisingly, this upward trend

Overall, 31 studies met the criteria for inclusion. The language learning programs used in those studies are categorized based on their intervention types, including reading, vocabulary, speaking, listening and writing. The important information and features of these studies are shown in Table 1. (Appendix A).

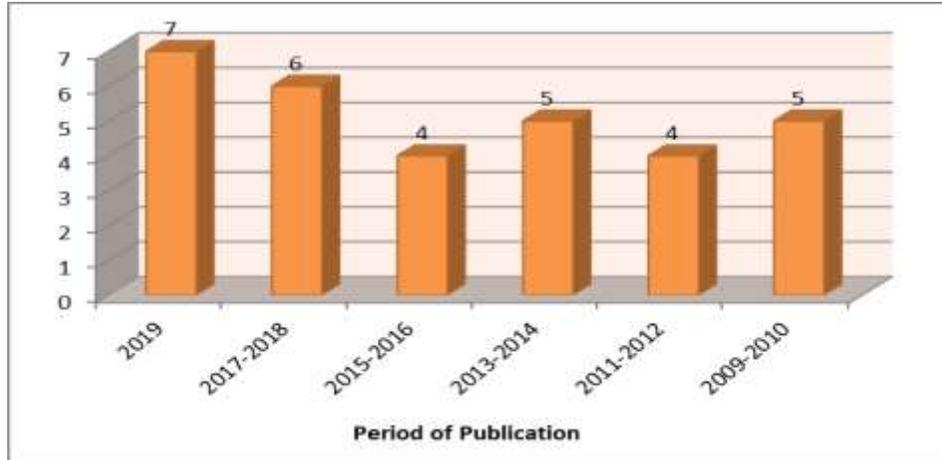


Figure 2. Distribution of selected papers for the period 2009 to 2019

### III. RESULT AND DISCUSSION

This paper described and reviewed studies for elementary grade language learning programs that are focused on multimedia and multimedia-assisted. The analysis gave rise to 145 papers and 31 programs. Thus, the content and instructional mechanisms of intervention programs for language learning were summarized in this article, along with the result of their interventions. Table 1 shows the important information and features of these studies. Various aspects of language learning intervention research are discussed in this section.

#### 3.1 Interventions

Studies that used reading and vocabulary hold bigger shares, as illustrated in Figure 3. Therefore, a large number of the interventions centralize on Reading by using multimedia (e.g. e-book based detection system, two flashcard-based, etc.) and then vocabulary by using multimedia (e.g. Rosetta stone computer software, games, etc.). Language teachers typically recognize the importance of acquiring vocabulary and searching for more effective ways to specifically teach vocabulary (Sharifi, Azizifar, Jamalinesari, & Gowhary, 2015). It is surprising when one knows that multimedia has a proven impact on vocabulary (Abraham, 2008; Chen, 2009), but it requires quite a lot of time. It is not possible to acquire a large amount of vocabularies during school term. Therefore, extensive in-home programs could be a suitable solution for achieving this goal. Additionally, technologies such as computers might be used to increase the rate of incidental vocabulary acquisition.

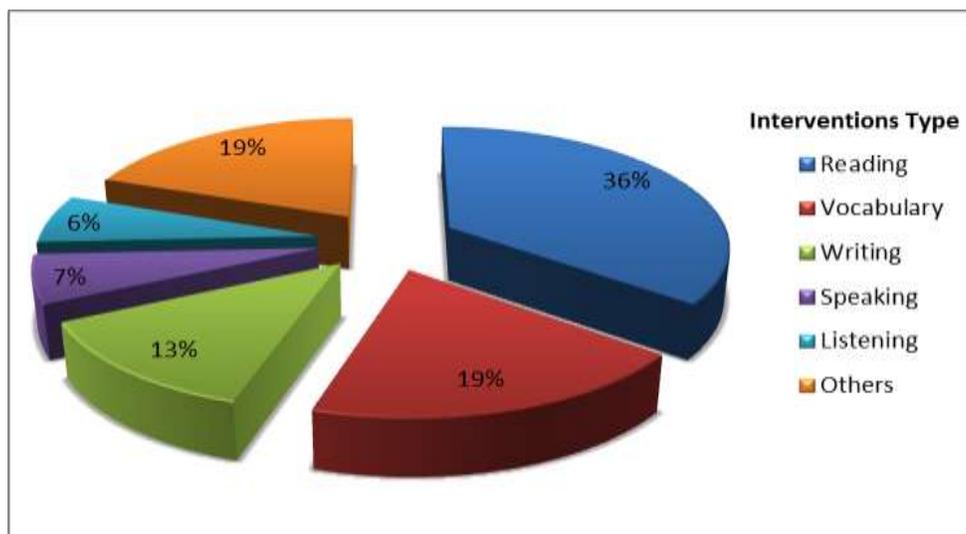


Figure 3. Distribution of reviewed programs based on intervention type.

These reviewed programs based on intervention type are (1) **Reading**; Cognitive Skill (Keung & Ho, 2009), massive multiplayer online role-playing game (MMORPG) (Suh, Kimt, & Kim, 2010), Curriculum (Kasapo, 2010), Overlapping Waves Model (Lindberg et al., 2011), Scaffolding (Royanto, 2012), Discourse Skills (Yeung, Ho, Chan, Chung, & Wong, 2013), Technology (Jamshidifarsani, Garbaya, Lim, Blazevic, & James, 2018), e-book based detection system (P. Lin, Su, & Huang, 2018), two flashcard-based (Klingbeil, January, & Ardoin, 2019), Morphological awareness (Robertson & Deacon, 2019) and Nonsense Word Fluency (NWF) & Oral Reading Fluency (DORF) (Council, Gardner, Cartledge, & Alana, 2019). (2) **Vocabulary**; Reading Development (Verhoeven, Leeuwe, & Vermeer, 2011), PBL and non-PBL (L. fang Lin, 2015), Media Type (Silverman et al., 2018), autonomy and collaboration (Tseng, Liou, & Chu, 2019), and Games "PowPow (Andreani & Ying, 2019). (3) **Writing**; massive multiplayer online role-playing game (Suh et al., 2010), Curriculum (Kasapo, 2010), Genre-based approach (Oliveira & Lan, 2014), and Situated Language learning (Hwang, Chen, Shadiev, Huang, & Chen, 2014). (4) **Speaking**; Website (Tsou, Wang, & Tzeng, 2006) and Peer Assessment (Hung, 2018). (5) **Listening**; massive multiplayer online role-playing game (Suh et al., 2010) and Children Literature (Gulec & Durmus, 2015). (6) **Others**; thematic ((Rachmadtulla, Iasha, & Sofyan, 2019; Rachmatullah, Zulela, & SYarif, 2019; Saputri & Indriayu, 2018), Language Skills (Wu, 2011), Communicative Language (Kuo, Yu, & Hsiao, 2015), Learning English (Matsuzaki, Ozaki, & Maeda, 2013), and Technology (Chin, Hong, Chen, & Member, 2014).

### 3.2 Multimedia

Multimedia is a hardware and software computer system that makes it easy to combine pictures, video, photographs, graphics, and animations with voice, text, and data managed by computer programs (Rachmatullah et al., 2019). Multimedia is a device capable of creating dynamic and interactive presentations integrating text, audio, video images, graphics, and animation (Teoh & Neo, 2007). Multimedia has four essential components. First, a computer must be in a position which schedules what is seen and heard. Second, there needs to be a link connecting the user to the details. Thirdly, a navigation device must be in a place that will help the user navigate the linked information network. Fourthly, multimedia provides a place for users to gather, process, and communicate ideas (Ratnawati & Faridah, 2017). Multimedia can be divided into four categories, namely interactive multimedia, linear multimedia, hyperactive multimedia, and kits multimedia. First, Interactive multimedia is a multimedia interface equipped with controller devices that can be controlled by the user, allowing users to select what they want for the next step such as applications program and game applications. Second, linear multimedia is multimedia that doesn't have any controller in it such as TV, movies, and e-books. Third, hyperactive multimedia is multimedia which can be controlled by users via links to existing multimedia elements such as website and games online. Fourth, Kits multimedia is Multimedia is used as learning, involving more than one type of media and organized by a single subject such as audiotapes and CD-ROMs. In this paper, the researchers decided to develop multimedia as a learning tool for elementary school students. This multimedia is expected to help the primary school learning process. The distribution of reviewed interventions based on multimedia details of these studies is shown in Figure 4.

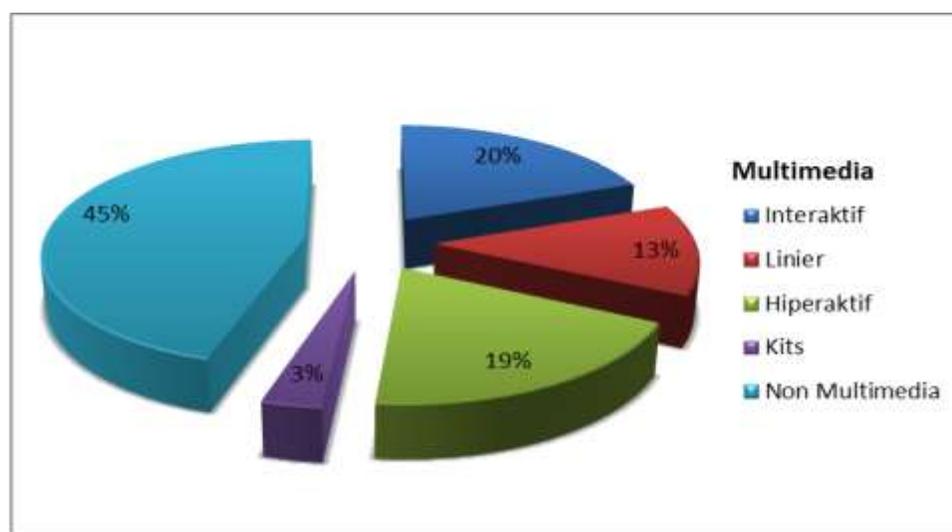


Figure 4. Distribution of the interventions reviewed based on multimedia.

3.3 Technologies

From the 31 language learning programs mentioned in this article, 20 were computer-based. Mobile phones and tablets were used only five and two times. The distribution of reviewed programs based on technologies details of these studies are shows in Figure 5. It is noteworthy that there is so little research devoted to determining the effect of smartphone and tablet literacy devices on learning English. Given the abundance of English apps available in mobile phones and tablets, studying their effectiveness and seeing which elements of instruction have a greater impact would be beneficial. Besides, too few articles have studied an in-home intervention that is comprehensible because it would be harder and less reliable to track the intervention's fidelity (Jamshidifarsani et al., 2018), but given that nowadays most people are connected to the internet, all usage and performance data can be easily and automatically recorded and transferred. In the absence of their instructor, software applications can be developed flexible enough to give the children customized learning experiences, which can supply an outlet for students who have not access to trained tutors.

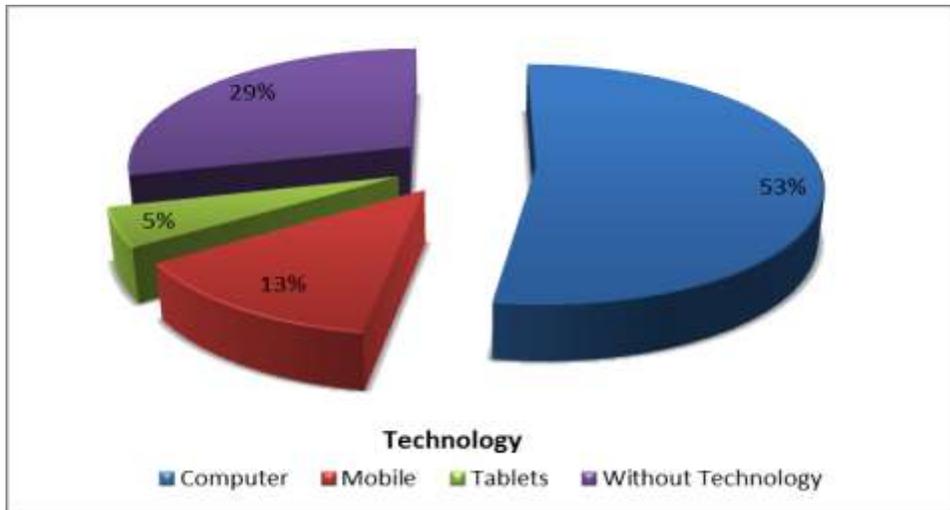


Figure 5. Distribution of the interventions reviewed based on technologies.

3.4 Grade Levels

Studies that specifically mentioned the target group grade level as shown in Figure 6, more attention was given to fifth, and second graders (each with approximately 24 and 19 percent), which was expected. Fifth grade has assessed students' critical thinking ability, so an appropriate test is a software package that manages time, self-assesses, and keeps notes for teachers (Suh et al., 2010). There is a general belief, for the second grade, that previous interventions are more efficacious and are validated by numerous scientific studies (Lovett et al., 2017).

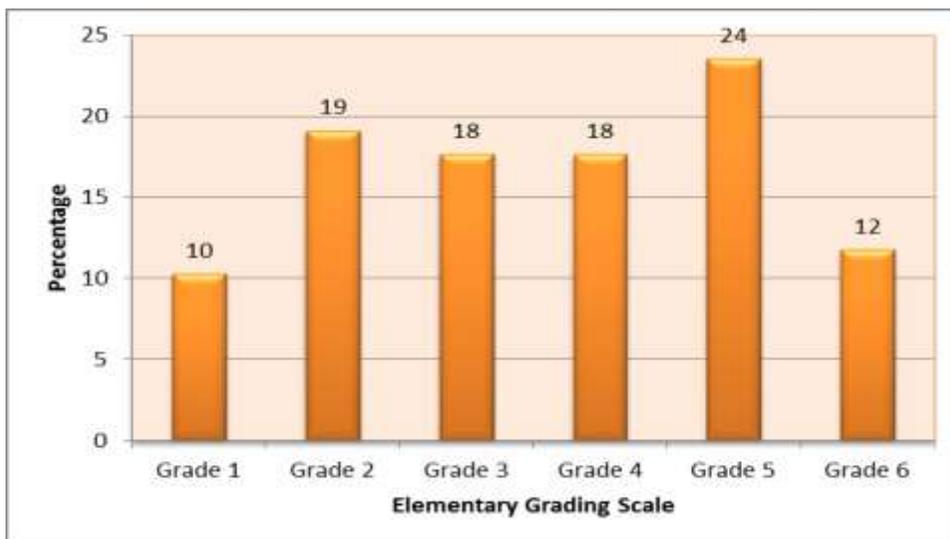


Figure 6. The percentage of each elementary grade scale

#### IV. CONCLUSION

Since English learning is of the utmost importance and the severe consequences of English learning failure, several researchers have been inspired to develop novel methods to establish more successful English learning strategies. This research aimed to provide a comprehensive overview of multimedia-based or multimedia-assisted intervention studies in English learning for primary grades. This studies aims to supply exhaustive information to researchers and designers of English learning programs on the existing approaches applied to each portion of skills and to offer suggestions by reviewing the studies examined concerning various aspects. Since similar studies were published before 2000, but with each competency such as reading, writing, speaking, and listening programs, this systematic review analysis examined the period from 2009 to 2019. The English learning programs in this paper are classified into five categories: reading, writing, speaking, listening and vocabulary. Finally, the paper presents an analysis of the relevant aspects identified in the reviewed intervention studies on English learning. One hundred and forty-five experiments were reviewed, resulting in 31 programs. Surprisingly, only two studies studied a speaking and listening intervention; this suggests that it is widely underestimated to use multimedia to develop the English language by speaking and listening to early learners. As already stated, this indicates that comprehensive home-based intervention could be a potential solution. Moreover, the use of non-computer technology, such as mobile phones and tablets, is less than anticipated. In addition to the existing pedagogical approaches used in classrooms, designers are recommended to take advantage of the recent advances in digital and information technology to implement new methods not available in schooling.

#### REFERENCES

- Abraham, L. B. (2008). Computer-mediated glosses in second language reading comprehension and vocabulary learning: A meta-analysis. *Computer Assisted Language Learning*, 21(3), 199–226. <https://doi.org/10.1080/09588220802090246>
- Andreani, W., & Ying, Y. (2019). ScienceDirect ScienceDirect " PowPow " interactive game in supporting English vocabulary " PowPow " interactive game in supporting English vocabulary learning for elementary students learning for elementary students. *Procedia Computer Science*, 157, 473–478. <https://doi.org/10.1016/j.procs.2019.09.005>
- Boeriswati, E. (2013). Using Sponge Puppet Strategies to Instill Characters through Storytelling to Elementary School Students in Bekasi. *2nd International Seminar on Quality and Affordable Education (ISQAE 2013)*, (Isqae), 410–413.
- Burchinal, M., Mccartney, K., Steinberg, L., Crosnoe, R., Friedman, S. L., Mcloyd, V., ... Child, N. E. (2011). Examining the Black – White Achievement Gap Among Low-Income Children Using the NICHD Study of Early Child Care and Youth Development. *Child Development*, 82(5), 1404–1420. <https://doi.org/10.1111/j.1467-8624.2011.01620.x>
- Chen, Y. (2009). A Cognitive Linguistic Approach to Classroom English Vocabulary Instruction for EFL Learners in Mainland China. *English Language Teaching*, 2(1), 95–100. <https://doi.org/10.5539/elt.v2n1p95>
- Chin, K., Hong, Z., Chen, Y., & Member, S. (2014). Impact of Using an Educational Robot-Based Learning System on Students' Motivation in Elementary Education. *Transactions on Learning Technologies*, 7(4), 333–345.
- Clark, C., & Mayer, R. E. (2011). *E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning* (Third Edit). San Fransisco: John Wiley & Sons, Inc.
- Council, M. R., Gardner, R., Cartledge, G., & Alana, O. (2019). Improving reading within an urban elementary school: computerized intervention and paraprofessional factors. *Preventing School Failure: Alternative Education for Children and Youth*, 0(0), 1–13. <https://doi.org/10.1080/1045988X.2018.1540392>
- Dickinson, D. K., Golinkoff, R. M., & Hirsh-pasek, K. (2010). Speaking Out for Language: Why Language Is Central to Reading Development. *Educational Researcher*, 39(4), 305–310. <https://doi.org/10.3102/0013189X10370204>
- Gulec, S., & Durmus, N. (2015). A Study Aiming To Develop Listening Skills Of Elementary Second Grade Students. *Procedia - Social and Behavioral Sciences*, 191, 103–109. <https://doi.org/10.1016/j.sbspro.2015.04.487>
- Hart, B., & Risley, T. R. (1992). American Parenting of Language-Learning Children: Persisting Differences in Family-Child Interactions Observed in Natural Home Environments. *Developmental Psychology*, 28(6), 1096–1105.
- Hung, Y. (2018). Group peer assessment of oral English performance in a Taiwanese elementary school. *Studies in Educational Evaluation*, 59(February), 19–28. <https://doi.org/10.1016/j.stueduc.2018.02.001>

- Huttenlocher, J., Waterfall, H., Vasilyeva, M., Vevea, J., & Hedges, L. V. (2010). Sources of variability in children's language growth. *Cognitive Psychology*, *61*, 343–365. <https://doi.org/10.1016/j.cogpsych.2010.08.002>
- Hwang, W., Chen, H. S. L., Shadie, R., Huang, Y., & Chen, C. (2014). *Improving English as a foreign language writing in elementary schools using mobile devices in familiar situational contexts*. (December), 37–41. <https://doi.org/10.1080/09588221.2012.733711>
- Jamshidifarsani, H., Garbaya, S., Lim, T., Blazevic, P., & James, M. (2018). Technology-based reading intervention programs for elementary grades: An analytical review. *Computers & Education*. <https://doi.org/10.1016/j.compedu.2018.10.003>
- Kasapo, K. (2010). A qualitative analysis : How is elementary reading and writing curriculum constructed by first graders ? *Procedia - Social and Behavioral Sciences*, *2*, 996–1001. <https://doi.org/10.1016/j.sbspro.2010.03.140>
- Keung, Y., & Ho, C. S. (2009). Transfer of reading-related cognitive skills in learning to read Chinese ( L1 ) and English ( L2 ) among Chinese elementary school children. *Contemporary Educational Psychology*, *34*(2), 103–112. <https://doi.org/10.1016/j.cedpsych.2008.11.001>
- Klingbeil, D. A., January, S. A., & Ardoin, S. P. (2019). Comparative Efficacy and Generalization of Two Word - Reading Interventions with English Learners in Elementary School. *Journal of Behavioral Education*. <https://doi.org/10.1007/s10864-019-09331-y>
- Kuhl, P. K. (2010). Review Brain Mechanisms in Early Language Acquisition. *Neuron*, *67*(5), 713–727. <https://doi.org/10.1016/j.neuron.2010.08.038>
- Kuo, F., Yu, P., & Hsiao, W. (2015). Develop and evaluate the effects of multimodal presentation system on elementary student learning effectiveness : within classroom English learning activity. *Procedia - Social and Behavioral Sciences*, *176*, 227–235. <https://doi.org/10.1016/j.sbspro.2015.01.465>
- Leow, M. F. (2014). Interactive Multimedia Learning: Innovating Classroom Education in a Malaysian University. *The Turkish Online Journal of Educational Technology*, *13*(2), 99–110.
- Lin, L. fang. (2015). The impact of problem-based learning on Chinese-speaking elementary school students' English vocabulary learning and use. *System*, *55*, 30–42. <https://doi.org/10.1016/j.system.2015.08.004>
- Lin, P., Su, Y., & Huang, Y. (2018). Evaluating reading fluency behavior via reading rates of elementary school students reading e-books. *Computers in Human Behavior*. <https://doi.org/10.1016/j.chb.2018.10.004>
- Lindberg, S., Lonnemann, J., Linkersdörfer, J., Biermeyer, E., Mähler, C., Hasselhorn, M., & Lehmann, M. (2011). Early strategies of elementary school children's single word reading. *Journal of Neurolinguistics*, *24*(5), 556–570. <https://doi.org/10.1016/j.jneuroling.2011.02.003>
- Lovett, M. W., Frijters, J. C., Wolf, M., Steinbach, K. A., Sevcik, R. A., Morris, D., ... Morris, R. D. (2017). Early Intervention for Children at Risk for Reading Disabilities : The Impact of Grade at Intervention and Individual Differences on Intervention Outcomes Early Intervention for Children at Risk for Reading Disabilities : *Educational Psychology*. <https://doi.org/http://dx.doi.org/10.1037/edu0000181>
- Mantiri, F. (2014). Multimedia and Technology in Learning. *Universal Journal of Educational Research*, *2*(9), 589–592. <https://doi.org/10.13189/ujer.2014.020901>
- Matsuzaki, J., Ozaki, K., & Maeda, T. (2013). Motivational model of English learning among elementary school students in Japan. *Journal System*, *41*(3), 706–719. <https://doi.org/10.1016/j.system.2013.07.017>
- Minkova, Y. (2016). Contemporary Multimedia Authoring Tools. *International Journal of Engineering Science and Computing*, *6*(10), 2586–2588.
- Oliveira, L. C. De, & Lan, S. (2014). ScienceDirect Writing science in an upper elementary classroom : A genre-based approach to teaching English language learners. *Journal of Second Language Writing*, *25*, 23–39. <https://doi.org/10.1016/j.jslw.2014.05.001>
- Rachmadtulla, R., Iasha, V., & Sofyan, H. (2019). CD-Based Interactive Multimedia on Integrative Thematic Learning in Elementary School. *ICTES (International Conference on Technology and Education Science)*. <https://doi.org/10.4108/eai.21-11-2018.2282040>
- Rachmatullah, R., Zulela, M., & SYarif, M. (2019). Computer-based interactive multimedia : a study on the effectiveness of integrative thematic learning in elementary schools. *Journal of Physics*, (012028). <https://doi.org/10.1088/1742-6596/1175/1/012028>
- Ratnawati, & Faridah, D. (2017). Engaging Multimedia Into Speaking Class Practices : Toward Student's Achievement And Motivation. *Linguistic and Aenglish Teaching*, *2*(2), 167–176. <https://doi.org/http://dx.doi.org/10.24903/sj.v2i2.135> Engaging
- Robertson, E. K., & Deacon, H. (2019). Morphological awareness and word-level reading in early and middle elementary school years. *Applied Psycholinguistics*, (40), 1051–1071. <https://doi.org/10.1017/S0142716419000134>

- Roblyer, M. D., & Hughes, J. E. (2018). *Integrating Educational Technology into Teaching : Transforming Learning Across Disciplines* (Eighth Edi). Newyork: Pearson Education Inc.
- Rodriguez, E. T., & Tamis-lemonda, C. S. (2011). Trajectories of the Home Learning Environment Across the First 5 Years: Associations With Children ' s Vocabulary and Literacy Skills at Prekindergarten. *Child Development*, 82(4), 1058–1075. <https://doi.org/10.1111/j.1467-8624.2011.01614.x>
- Romeo, R. R., Leonard, J. A., Robinson, S. T., West, M. R., Mackey, A. P., Rowe, M. L., & Gabrieli, J. D. E. (2018). Beyond the 30-Million-Word Gap : Children ' s Conversational Exposure Is Associated With Language-Related Brain Function. *Psychological Science*, 29(5), 700–710. <https://doi.org/10.1177/0956797617742725>
- Rowe, M. L., Raudenbush, S. W., & Goldin-meadow, S. (2012). The Pace of Vocabulary Growth Helps Predict Later Vocabulary Skill. *Child Development*, 83(2), 508–525. <https://doi.org/10.1111/j.1467-8624.2011.01710.x>
- Royanto, L. R. M. (2012). The Effect of An Intervention Program Based on Scaffolding to Improve Metacognitive Strategies in Reading: A Study of Year 3 Elementary School Students in Jakarta. *Procedia - Social and Behavioral Sciences*, 69(Iceepsy), 1601–1609. <https://doi.org/10.1016/j.sbspro.2012.12.105>
- Santos, M. E. C., Chen, A., Taketomi, T., Yamamoto, G., Miyazaki, J., & Kato, H. (2014). Augmented Reality Learning Experiences : Survey of Prototype Design and Evaluation. *Transactions on Leisarning Technolog*, 7(1), 38–56.
- Saputri, D. Y., & Indriayu, M. (2018). Need Assessment of Interactive Multimedia Based on Game in Elementary School : A Challenge into Learning in 21 st Century. *International Journal of Educational Research Review*, 3(3), 1–8.
- Schneider, S., Beege, M., Nebel, S., & Rey, G. D. (2018). A meta-analysis of how signaling a ff ects learning with media. *Educational Research Review*, 23(August 2017), 1–24. <https://doi.org/10.1016/j.edurev.2017.11.001>
- Sharifi, M., Azizifar, A., Jamalinesari, A., & Gowhary, H. (2015). The Effect of Rosetta Stone Computer Software on Vocabulary Learning of Iranian Elementary EFL Learners. *Procedia - Social and Behavioral Sciences*, 192, 260–266. <https://doi.org/10.1016/j.sbspro.2015.06.037>
- Silverman, R. D., Artzi, L., Mcneish, D. M., Hartranft, A. M., Martin-beltran, M., & Peercy, M. (2018). The relationship between media type and vocabulary learning in a cross age peer-learning program for linguistically diverse elementary school students. *Contemporary Educational Psychology*. <https://doi.org/10.1016/j.cedpsych.2018.12.004>
- Suh, S., Kimt, S., & Kim, N. (2010). Effectiveness of MMORPG-based instruction in elementary English education in Korea. *Journal of Computer Assisted Learning*, 26, 370–378. <https://doi.org/10.1111/j.1365-2729.2010.00353.x>
- Teoh, B. S., & Neo, T. (2007). Interactive Multimedia Learning : Students ' Attitudes And Learning Impact In An Animation Course. *Turkish Online Journal of Educational Technology*, 6(4).
- Tseng, W., Liou, H., & Chu, H. (2019). Vocabulary learning in virtual environments: Learner autonomy and collaboration. *System*, 102190. <https://doi.org/10.1016/j.system.2019.102190>
- Tsou, W., Wang, W., & Tzeng, Y. (2006). Applying a multimedia storytelling website in foreign language learning. *Computer and Education*, 47, 17–28. <https://doi.org/10.1016/j.compedu.2004.08.013>
- Usman, H., Maksum, A., & Sutisna, A. (2020). Whole Language Approach; Teaching English Language For Primary Students. *Journal of Xi'an University of Architecture & Technology*, XII(II), 2551–2567. <https://doi.org/20.19001.JAT.2020.XII.II.20.2067>
- Verhoeven, L., Leeuwe, J. Van, & Vermeer, A. (2011). Scientific Studies of Reading Vocabulary Growth and Reading Development across the Elementary School Years. *Scientific Studies of Reading*, 1(March 2015), 37–41. <https://doi.org/10.1080/10888438.2011.536125>
- Walker, D., Greenwood, C., & Hart, B. (2016). Prediction of School Outcomes Based on Early Language and Socioeconomic Factors. *Society for Research in Child Development Stable*, 65(2), 606–621.
- Walker, D., Sepulveda, S. J., Hoff, E., Rowe, M. L., Schwartz, I. S., Dale, P. S., ... Bigelow, K. M. (2019). Language intervention research in early childhood care and education: A systematic survey of the literature. *Early Childhood Research Quarterly*, (xxx), 1–18. <https://doi.org/10.1016/j.ecresq.2019.02.010>
- Wang, Y. (2009). Using Films in the Multimedia English Class. *English Language Teaching*, 2(1), 179–184. <https://doi.org/10.5539/elt.v2n1p179>
- Winarno, S., Muthu, K. S., & Ling, L. S. (2018). Impacts of m-DPBL Approach towards Computer Networks Teaching and Learning Process State of the art. *International Journal of Emerging Technologies in Learning*, 13(3), 207–215.
- Wu, T.-Y. (2011). Learning English in Taiwan's Elementary Schools. *Journal of Futures Studies*, 16(December

2011), 35–46.

Yeung, P., Ho, C. S., Chan, D. W., Chung, K. K., & Wong, Y. (2013). A model of reading comprehension in Chinese elementary school children ☆. *Learning and Individual Differences*, 25, 55–66. <https://doi.org/10.1016/j.lindif.2013.03.004>