

Students' Perceptions of Using Roblox in Multimodal Literacy Practices in Teaching and Learning English

T. Silvana Sinar¹, Mohammad Andri Budiman², Rohani Ganie¹, & Rusdi Noor Rosa³

¹ English Literature Department, Universitas Sumatera Utara, Jalan Universitas No. 19 Kampus USU Padang Bulan 20155 Medan, Indonesia

² Computer Science Study Program, Universitas Sumatera Utara, Jalan Alumni No. 3 Kampus USU Padang Bulan 20155 Medan, Indonesia

³ English Department, Universitas Negeri Padang, Jalan Prof. Hamka Air Tawar 25173 Padang, Indonesia

Correspondence: T. Silvana Sinar, English Literature Department, Universitas Sumatera Utara, Jalan Universitas No. 19 Kampus USU Padang Bulan 20155 Medan, Indonesia.

Received: May 15, 2023

Accepted: June 19, 2023

Online Published: July 11, 2023

doi:10.5430/wjel.v13n7p146

URL: <https://doi.org/10.5430/wjel.v13n7p146>

Abstract

The need for digital technology involvement in education is increasingly apparent, so learning techniques are required to be prepared in various digital formats. Using digital learning materials enables teachers to implement the current concept of literacy, i.e., multimodal literacy. This study aims to find out the students' need for digital literacy and their perceptions of using the Roblox game as the learning media to improve their multimodal literacy. This descriptive study used a survey method, taking the second-year junior high school students in the 2021-2022 academic year in one of the state junior high schools in Medan, Indonesia as the respondents. The data were collected using two sets of closed-ended questionnaires. The data obtained from the first questionnaire were analyzed using a forced choice technique for yes or no answers, while the data obtained from the second questionnaire were analyzed using a 4-Point Likert Scale. The results indicate the students' need for digital literacy and their good perceptions of using Roblox as the learning media in improving their English multimodal literacy. It is concluded that teaching English at junior high school is expected to be designed in a digital format by involving games as the media, facilitating the students to improve their English multimodal literacy.

Keywords: digital learning materials; Industrial Revolution 4.0; multimodal literacy; Roblox

1. Introduction

The fourth industrial revolution is known for information and communication technology innovations in various fields. One example is digital literacy, which uses technology to find, evaluate, create, and communicate information (American Library Association, 2023). Education, which follows the development of digital information technology fields, is one of the most important sectors in development during the industrial revolution 4.0.

English literacy learning is also under the development of 21st-century learning in the era of the industrial revolution 4.0, which requires students to improve digital literacy skills, as confirmed in several previous studies. Hammarström (2001), for example, investigated how Swedish high schools incorporated digital literacy into English courses. The findings of this study have shown the importance of digital literacy in learning according to the guiding text and have the greatest influence on Swedish students. The findings also imply that future English teachers should familiarize themselves with various programs and websites that can be utilized to teach and learn English (Azmina et al., 2019).

Literacy, which used to be defined as the ability to read and write in schools, now includes the ability to read, write, listen, speak, calculate, think critically, interpret, communicate, create, use printed and written materials in various contexts, and read on-screen, involving not only language but also multimedia-based design (Kress, 2003, p. i). Therefore, the advance in technological development ushers in a new era of learning that is not limited to reading and writing.

Literacy is increasingly important for students in understanding visual texts in class. They need to be equipped with an understanding of the language of visual elements, the aesthetics of visual texts, and the construction of the nature of these texts as social products that reflect the dominant ideology of their time. In other words, the students need to: (1) process and produce a text; (2) relate and construe the context of the situation; (3) develop the potential that lies behind the text; and (4) relate and construe the context of culture that lies behind that scenario. These are not independent process components with separate tasks connected, but they are multiple viewpoints on a single, unitary process (Halliday, 2007). Consequently, language teachers need to explain words and the meaning of words in context to help students correctly use the vocabulary learned. In the explanation, they should involve listening and speaking multiliteracy skills (e.g., sound, hearing, and visual senses) as a resource supported by various means, namely culture, content, and communicative expressions, such as pictures, videos, and forms of teaching that incorporate language and the use of non-language and simulation. Jewit (2008) argues

that multiliteracy is so important that he proposes the implementation of a literacy model in teaching for its relevance to communicative technology in the contemporary digital era. The same idea was voiced by Hong and Hua (2020), who believe that multiliteracies pedagogy in classroom teaching benefits teachers, educators, and learners.

The linguistic analysis also developed due to the development of ICT (information, communication, and technology), which led humans to the digital era, an era of rapid development of science, technology, and information implemented for society's benefit in everyday life. Experts believe that improving language literacy is not only focused on verbal data, but simultaneously on the use of multimodal means. Kress and van Leeuwen (2001) state that, in a semiotic event, several means of communication are combined to reinforce, complement, or be in a particular order.

These developments and changes have consequences for the Indonesian people, who receive various global influences in all areas of life: economy, politics, language, culture, ideology, and even lifestyle. Today's Indonesian youth are no longer illiterate or unable to read and write. The 21st-century education prepared for them is a way to solve the complex problems they will face in the real world. There is an urgent need to equip the youth with 21st-century skills based on market needs analysis. A study found that lesson plans of three days or longer showed higher levels of 21st-century competencies (Burton & Stehle, 2019). When people want to compete in the era of globalization, one of the most important things they must learn is language, especially English as the international language (Simões Calvo & de Oliveira Alonso, 2020).

Furthermore, Tican and Deniz (2019) studied 391 senior students from the education faculty. It revealed that gender, department attendance, academic achievement, private tutoring experience, and practicum teaching all had a significant impact on pre-service teachers' assessment of the capacity of 21st-century learners and teachers. This view is important to apply in the world of 21st-century learning, which demands an integrated learning model through the use and utilization of technology, one of which is video games.

The improvement of English literacy in gameplay connected with multimodal analysis in this study is beneficial. First, for literacy learners, multimodal analysis through playing games can improve the students' problem-based learning abilities as they will act as speakers, listeners, readers, writers, viewers, and presenters. Students have a direct opportunity to talk with their classmates, enjoy reading literacy, and develop character in responding to a series of images in various visual forms displayed, writing an interesting narrative of the game read. Using video games as learning media provides the students with various advantages, including: (i) making the learning atmosphere more enjoyable; (ii) reducing the students' learning boredom; (iii) making the students get to know computer technology; (iv) developing the students' habit to follow directions and rules; (v) promoting problem solving-based learning; (vi) training the students' motor nerves and spatial skills; (vii) establishing child-parent communication when playing together; and (viii) providing entertainment (Rusman et al., 2013).

Second, multimodal analysis benefits teachers by laying out its basic premise that English literacy aimed at learning by domain analyzes the role of language in making learners' problem-based learning ability optimal. Figure 1 is the front view of the Roblox game, whose multimodal analysis is presented below.



Figure 1. The front view of Roblox

(<https://en.islcollective.com/english-esl-video-lessons/grammar-topic/present-simple-tense/roblox-gameplay/461009>)

Based on the ideational meaning, the central character of the element acts as the carrier of the game, and the element acts as a possessive attribute that adds information to the goal character. Based on the interpersonal meaning, the elements in the game do not have a social distance connection, but have a high angle of involvement because game players are instructed to point to directions to the right, left, up, and down, and wind directions such as east, southeast, south, southwest, west, northwest, north and northeast. Learning directions are obviously beneficial for game players to understand and master the literacy of reading directions in English. Based on the textual meaning, three points

are described, i.e., information value, image prominence, and frames that provide a minimum or maximum spacing and are connected or not. For example, Element 1 in Figure 1 moves to the bottom left of the image and has a given and tangible information value. Its small size (compared to Element 2) and its position reduce prominence to a minimum even though it has a contrasting color and a white border frame that distinguishes it from the environment, framing being the maximum disconnection. Element 2 is placed in the center of the image, thus giving it a centralized information value, gaining maximum salience due to its position in the center, becoming the largest among the five elements. This suggests that Element 2 is the element to which players should pay the most attention during the game. Element 3, Element 4, and Element 5 all have the same information value, prominence, and frame because they are all positioned on the left side of the image. This learning emphasizes the importance of understanding position, color, and size.

The gaming platform used in this research is Roblox. Founded by David Baszucki and Erik Cassel in 2004, Roblox hosts user-generated games in many genres, such as racing games, role-playing games, simulations, and obstacle courses, coded in the Lua programming language (Takahashi, 2020). The essential point of this study is to use the Roblox game for teaching literacy in the classroom. As a worldwide game, it is accessible to a large international learner audience. Baszucki (2015) described Roblox as a network-based gaming system that includes a website hosted by a web server connected to the network. Previous studies have used Roblox as the learning media (Han et al., 2023; Meier et al., 2020). Nevertheless, to the best knowledge of the researchers, only one study was conducted on using Roblox in teaching English. The study found that a user-generated 3D environment (Roblox) was helpful in learning English, especially the English learning with a Problem-Based Learning approach (Mustafa et al., 2020). Their study implies that there is a significant relationship between the frequency of playing games and English writing skills (Herda, 2021). Therefore, a study on Roblox in teaching English is obviously necessary. Unlike the previous study, this present study explores the possibility of using Roblox as the digital learning resource to improve the students' English multimodal literacy. The research questions formulated in this article are: (i) How are the students' needs for digital literacy; and (ii) What are the students' perceptions of using Roblox in improving their English multimodal literacy?

2. Method

This research used a descriptive approach because the data were presented in numerical and descriptive form. A survey method was used as the research design through which the respondents delivered their perceptions on using multimodal literacy in English learning. The respondents of the study were the second-year junior high school students in the 2021-2022 academic year in one of the state junior high schools in Medan, Indonesia. The total number of respondents was 62 students.

The researchers utilized questionnaires as the instrument of the research. Two sets of questionnaires were distributed to the respondents. The first set was intended to collect the data concerning the students' need for digital literacy, distributed to the students before they were introduced to the use of Roblox in learning English multimodal literacy. The questionnaire was close-ended with two options (Yes or No). The second set was intended to collect the data concerning their perceptions of using Roblox in learning English multimodal literacy. The second questionnaire was a closed-ended questionnaire with four options for the degree of agreement: strongly agree (SA), agree (A), disagree (DA), and strongly disagree (SDA). Using four options was intended to obtain more reliable data, as suggested in several previous studies (Sofyan et al., 2023; Taherdoost, 2019). Before collecting the data from the second set of questionnaires, the researchers created a 10 hours multimodal English language training program that combines English learning systems with visual literacy. The researchers combined techniques to aid students' learning and improve their soft skills, resulting in academically intelligent reasoning, attitude, and action. Providing a learning module for language teachers to use with their students, managed professionally, effectively, and efficiently. Quite a number of students frequently read various written and visual texts on social media such as Facebook, Instagram, and Twitter.

The data obtained from the first questionnaire were analyzed using a forced choice technique for yes or no answers (Callegaro et al., 2015; Stern, 2012). Meanwhile, the data obtained from the second questionnaire were analyzed using a 4-Point Likert Scale. The SA level was scored 4, the A level was scored 3, the DA level was scored 2, and the SDA level was scored 1. The sum of all levels became the total score of every item in the questionnaire. Then the total scores were ranked to determine the items' degree of the respondents' agreement.

3. Results

3.1 Students' Need for Digital Literacy

The results of data analysis from the first set of questionnaires indicate the student's needs for digital literacy in learning English in the era of the industrial revolution 4.0 (see Table 1). They show their interest in learning English through digital formats. 93% of the students are interested in reading multimodal verbal and visual texts, indicating their obvious need for digital materials. Multimodal verbal and visual texts are only possible when the learning sources are in a digital format. This result is supported by their second response, where 68% of them like to follow the learning trend in the era of the industrial revolution 4.0. Nevertheless, the fact shows that their teachers did not use multimedia texts frequently as most of them (84%) find it difficult to understand verbal and visual English texts. Furthermore, most of them (90%) believe that using digital media in learning will help them to understand English texts. The first four responses indicate the students' need for English learning through digital media: literacy: 84% of them need to acquire English digital literacy. The responses to the other questionnaire items (items 7 to 9) support their urgent need for English digital literacy: 84% of the students need vocabulary related to everyday life to improve their digital literacy, interactive learning media, and learning media with attractive colors and designs.

Table 1. Students' need for digital learning media in learning English

No	Statements	Responses	
		Yes	No
1	I'm interested in reading multimodal verbal and visual texts.	93%	7%
2	I follow the trend of learning in the era of the industrial revolution 4.0.	68%	32%
3	I find it difficult to understand verbal and visual English texts.	84%	16%
4	I need digital media to help my understanding of English texts.	90%	10%
5	I need to learn English reading through digital literacy.	84%	16%
6	I understand English learning reading with genre-based topics.	42%	58%
7	I need vocabulary related to everyday life to improve my digital literacy.	84%	16%
8	I need interactive learning media.	84%	16%
9	In my opinion, learning media should have attractive colors and designs.	84%	16%
10	Learning media that I have used in English learning:		
	None	16%	84%
	YouTube	51%	49%
	Roblox ISL Collective	29%	71%
	Video	13%	87%
	Props (e.g., pictures, etc.)	9%	81%
	Social media and other sources	26%	74%
11	I know about Roblox ISL Collective from my friends.	35%	65%
12	I know about Roblox ISL Collective from social media and other sources.	26%	74%
13	I agree when teachers apply Roblox video games, it will improve the students' reading and digital literacy skills.	77%	23%
14	In my opinion, the current school learning method is still appropriate for the student's level.	81%	19%
15	In my opinion, the multimodal learning method will motivate students to improve their verbal, visual, and digital literacy in the future era.	87%	13%
16	In my opinion, the multimodal learning method provides more opportunities for students to improve their reading of verbal and visual texts.	96%	4%
17	In my opinion, the group learning method is applied in English learning nowadays.	55%	45%

The question items 10 to 17 were about learning media that the students had used in learning English and group learning methods. YouTube is the most popular learning media used by the students (51%). Meanwhile, other media were used less frequently: Roblox ISL Collective (29%), social media (26%), and physical objects (9%). This finding indicates the students' need for digital media in learning English.

Despite its less popularity than YouTube as a learning media, Roblox ISL Collective has also been known by most of the students. 35% of them know it from their friends, and the other 26% of them know it from social media and other sources. Meanwhile, the other 39% of the students do not know about using Roblox ISL Collective as the media in learning English. Furthermore, in the context of using Roblox ISL Collective as the learning media, most of the students (77%) believe that using Roblox ISL Collective will improve the students' reading and digital literacy skills.

Using Roblox ISL Collective as the teaching media emphasizes building the students' digital literacy through various multimodalities. Therefore, most of them (87%) believe that the multimodal learning method will motivate them to improve their verbal, visual, and digital literacy in the future era. In addition, they believe that the multimodal learning method provides more opportunities for students to improve their reading of verbal and visual texts (96%). These findings suggest the urgent and important need to use the multimodality method in teaching English to senior high school students.

Nevertheless, most of them also think that the current learning methods used by their English teachers are suitable for their levels. 81% of them think that the current learning methods can motivate students to improve their digital literacy in the era of the industrial revolution 4.0; 96% of them think that the current learning methods provide more opportunities for students to read; and 55% of them think that group learning methods are applied in their current English learning.

After analyzing the results of the first questionnaire, the learning materials that the students need to improve their English digital literacy include: (a) learning media with attractive and interactive designs, which are only possible if prepared in a digital format; (b) learning media containing English vocabulary related to daily life; and (c) reading materials containing multimodal texts.

3.2 Students' Perception of Using the Roblox Game in Improving Their English Multimodal Literacy

Having been introduced to the use of Roblox game in learning English, the students were given the second set of questionnaires through which they provided their opinions about the Roblox game. The results of the questionnaire are provided in Table 2.

Table 2. Students' perception of using Roblox in improving English multimodal literacy

No	Statement	Responses			
		SA	A	DA	SDA
1	I join the training with joyful	50.0%	34.6%	7.7%	7.7%
2	I try to arrive/enter on time for English lessons.	23.1%	73.1%	3.8%	0.0%
3	I am ready to join the English learning activity when it starts.	26.9%	61.5%	11.5%	0.0%
4	I am always eager to participate in English learning activities.	15.4%	69.2%	15.4%	0.0%
5	I am always present during English lessons.	65.4%	23.1%	7.7%	3.8%
6	English learning is not difficult for me to understand.	15.4%	42.3%	34.6%	7.7%
7	I feel interested in the material presented by the teacher.	19.2%	57.7%	23.1%	0.0%
8	I pay close attention to the material being taught.	19.2%	65.4%	11.5%	3.8%
9	I pay attention when the teacher gives examples.	26.9%	61.5%	11.5%	0.0%
10	I understand all the material that the teacher explains.	26.9%	46.2%	23.1%	3.8%
11	I am very interested in the use of <i>Roblox ISL Collective</i> media.	26.9%	65.4%	3.8%	3.8%
12	Media <i>Roblox ISL Collective</i> creates learning not boring.	30.8%	65.4%	0.0%	3.8%
13	I feel that I understand what is presented in this media better.	26.9%	61.5%	7.7%	3.8%
14	The use of <i>Roblox</i> media <i>ISL Collective</i> makes me more excited about learning English.	26.9%	57.7%	7.7%	7.7%
15	I think <i>Roblox ISL Collective</i> media is easily accessible.	30.8%	57.7%	7.7%	3.8%
16	Learning with <i>Roblox ISL Collective</i> media is very useful for me.	19.2%	73.1%	3.8%	3.8%
17	<i>Roblox ISL Collective</i> media is very helpful in the learning process.	19.2%	73.1%	3.8%	3.8%
18	<i>Roblox ISL Collective</i> media is easy to use.	23.1%	69.2%	3.8%	3.8%
19	The visual appearance of <i>Roblox ISL Collective</i> is very attractive.	23.1%	69.2%	3.8%	3.8%
20	The menus and facilities (buttons) in the <i>Roblox ISL Collective</i> media are easy to understand.	26.9%	65.4%	3.8%	3.8%

The results displayed in Table 2 indicate that the students have a good perception of using the Roblox game in learning English digital literacy. More than 50% of the students agree with each item listed in the questionnaire. For example, 50% of the students show their strong agreement that the training using the Roblox game is joyful, and 34% of them show their agreement. This indicates that using the Roblox game can attract 84% of the students to learn English digital literacy. Their good perception is also shown in the second item of the questionnaire, where most of them (a total of 96.2% of the students) do not want to come late to the training using the Roblox game.

When asked about the factors leading them to show their good perception towards using the Roblox game in learning English, they like the game for its easy access and attractive package. A total of 92.4% of the students show that they are very interested in learning English by using the Roblox game as the media. A total of 96.2% of them agree that using the Roblox game in learning English creates an exciting learning atmosphere. A total of 88.5% of them show that using the Roblox game in learning English helps them understand the materials more easily.

4. Discussion

The results of this study confirm the previous studies about the students' need for using digital learning media in improving their English multimodal literacy (Azmina et al., 2019; Hammarström, 2001; Justin & Jaisankar, 2020; Lotherington & Jenson, 2011; Mustafa et al., 2020). Digital technologies are dominant communication media in a post-modern world (Lotherington & Jenson, 2011), and it is undeniable that their implementation in English learning will improve the students' English multimodal literacy.

Moreover, the findings also indicate that YouTube is the digital resource most frequently used by the learners in building their digital literacy. This is quite acceptable since YouTube is easily accessed and provides various digital resources. The advantages and effectiveness of YouTube as the media in learning English as a foreign language have been reported in many previous studies (Alkathiri, 2019; Athreh & Obeidat, 2022; Bastos & Ramos, 2019; Binmahboob, 2020; Juma, 2021; Muslem et al., 2022; Sari & Margana, 2019).

Learning media continues to develop along with the development of technology and education. Technology and education are two things that cannot be separated. The learning process does not always use conventional methods that only rely on the teacher's voice and stationery. This research contributes to the development of digital-based learning media games in public schools selected as research locations. Gameplay is the creation of game players to organize their resources to achieve goals in the game. This finding is consistent with Rusman et al. (2013), who argue that using games as the learning media can make the learning atmosphere more enjoyable and reduce boredom with information or material delivered by teachers to students.

As one of the digital media, the Roblox game attracts most of the students to learn English and improve their multimodal literacy. The effective use of Roblox as the learning media has been confirmed by previous studies (Meier et al., 2020; Mustafa et al., 2020). The use of Roblox game helps teachers foster the students to imply their problem-solving skills related to real-life issues in the English learning process (Mustafa et al., 2020).

Furthermore, the findings indicate that students had a good perception of using the Roblox game as the media in learning English. They absorb English vocabulary faster because each vocabulary is visualized with an attractive design. They do not only read and write, but they also listen to the English sounds and watch the gestures and other modalities used in the Roblox game. Such an experience increases the students' learning motivation in learning English. These findings confirm the previous literature about the effect of motivation on the

students' learning behavior and achievement (Azizoğlu, 2015; Mehndroo & Vandana, 2020; Özen, 2017; Sriyati et al., 2019; Tokan & Imakulata, 2019; Wu et al., 2022). Motivation even has a stronger effect on the students' learning achievement than the strategy applied by a teacher (Sriyati et al., 2019).

Fun, active, and interactive classroom atmosphere as well as students' high motivation are factors that help students learn English multimodal literacy more easily. Thus, the improvement of multimodal literacy of English in the era of industrial revolution 4.0 can be achieved.

5. Conclusions

English digital literacy is obviously required in the learning process in the era of industrial revolution 4.0, thus impacting how teachers prepare their learning materials or instructions. Digital learning materials, such as using games in the learning process, will help improve the students' multimodal literacy, which emphasizes activities more than simply reading and writing. Likewise, the students also have strong needs for multimodal literacy, especially in learning English.

Roblox game is one of the alternatives that can be brought to the learning process. The students have good perceptions on using the Roblox game in learning English multimodal literacy. A fun, active, and interactive classroom atmosphere is the best contribution of the Roblox game in improving the students' multimodal literacy. Such a good atmosphere increases the students' motivation that will affect their learning behavior and achievement. Students' good achievement is the ideal purpose of teaching.

Considering the advantages offered by the Roblox game, it is suggested that teachers, especially English teachers, use the Roblox game in teaching English to junior high school students. English literacy is not only indicated by the students' ability to read or write verbal texts, but it requires students to have the ability to read and write non-verbal texts, i.e., interpreting pictures, sounds, and other modalities into verbal texts.

This is just a small survey on using the Roblox game as the learning media in teaching English in a junior high school whose results cannot be generalized. In addition, the results presented in this paper are based on the students' perception on its uses, so the results are not strong enough to ensure its effectiveness in improving the students' English multimodal literacy. Nevertheless, it can become the basis for exploring the actual effect of the Roblox game on the students' English multimodal literacy. Therefore, future research is expected to be conducted by using experimental or classroom action research methods and involving wider participants or respondents.

Acknowledgements

The authors express their gratitude to the Research Institute of Universitas Sumatera Utara for funding this research under the TALENTA 2022 Research Grant.

References

- Alkathiri, L. A. (2019). Students' perspectives towards using Youtube in improving EFL learners' motivation to speak. *Journal of Education and Culture Studies*, 3(1), 12-30. <https://doi.org/10.22158/jecs.v3n1p12>
- American Library Association. (2023). Digital literacy. Retrieved on January 27th 2023 from <https://literacy.ala.org/digital-literacy/>
- Athreh, M. Y. A., & Obeidat, H. (2022). The perspectives of EFL students at Yarmouk University towards using YouTube in learning and understanding English during Covid-19 pandemic. *World Journal of English Language*, 12(8), 304-312. <https://doi.org/10.5430/wjel.v12n8p304>
- Azizoğlu, N., Aslan, S., & Pekcan, S. (2015). The periodic system and teaching with analogies model: The effects of teaching method, gender and motivation on students' achievement. *Elementary Education Online*, 14(2), 472-488. <https://doi.org/10.17051/ieo.2015.39450>
- Azmina, B., Endang, F., & Nur, A. D. (2019). Instructional design of CALL course in Indonesian higher education for future English teachers: A case study. *International Journal of Educational Research Review*, 4(2), 223-230. <https://doi.org/10.24331/ijere.518058>
- Bastos, A., & Ramos, A. (2009). YouTube for learning English as a foreign language: Critical thinking, communicative skills. *Proceedings of EDULEARN09 Conference*, pp. 2087-2092. Retrieved on December 21, 2022 from <https://core.ac.uk/download/pdf/55633635.pdf>
- Baszucki, D. (2015). *United States Patent No. US9028330B2*. Retrieved on November 15 2022, from <https://patents.google.com/patent/US9028330B2/en>
- Binmahboob, T. (2020). YouTube as a learning tool to improve students' speaking skills as perceived by EFL teachers in secondary school. *International Journal of Applied Linguistics & English Literature*, 9(6). <https://doi.org/10.7575/aiac.ijalel.v9n.6p.13>
- Burton, E. E. P., & Stehle, S. M. (2019). Developing student 21st century skills in selected exemplary inclusive STEM high schools. *International Journal of STEM Education*, 6(1), 1-15. <https://doi.org/10.1186/s40594-019-0192-1>
- Callegaro, M., Murakami, M. H., Tepman, Z., & Henderson, V. (2015). Yes–no answers versus check-all in self-administered modes: A systematic review and analyses. *International Journal of Market Research*, 57(2), 203-223. <https://doi.org/10.2501/IJMR-2015-014a>
- Halliday, M. A. K. (2007). *Language and education*. Continuum.
- Hammarström, T. (2001). *True North: The grand landscapes of Sweden*. Max Ström

- Han, J., Liu, G., & Gao, Y. (2023). Learners in the metaverse: A systematic review on the use of Roblox in learning. *Education Sciences, 13*, 1-23. <https://doi.org/10.3390/educsci13030296>
- Herda, M. D. (2021). *The correlation between playing mobile online games and students' writing skill of junior high school eight graders in MTsN 3 Malang* (Unpublished undergraduate thesis), Universitas Islam Negeri Maulana Malik Ibrahim. Retrieved from <http://etheses.uin-malang.ac.id/28393/>
- Hong, A. L., & Hua, T. K. (2020). A review of theories and practices of multiliteracies in classroom: Issues and trends. *International Journal of Learning, Teaching and Educational Research, 19*(11), 41-52. <https://doi.org/10.26803/ijlter.19.11.3>
- Jewit, C. (2008). Multimodality and literacy in school classrooms. *Review of Research in Education, 32*(1), 241-267. Retrieved from <https://doi.org/10.3102/0091732X07310586>
- Juma, M. J. (2021). Developing English pronunciation through animation and YouTube videos. *Arab World English Journal, 12*(4), 401-414. <https://doi.org/10.24093/awej/vol12no4.26>
- Justin, Z., & Jaisankar, D. (2020). Impact of digital media in English language teaching to the engineering students. *Test Engineering and Management, 83*(1), 1597-1600. Retrieved from <http://www.testmagazine.biz/index.php/testmagazine/article/view/3786>
- Kress, G. (2003). *Literacy in the new media age*, Routledge. <https://doi.org/10.4324/9780203299234>
- Kress, G., & Van Leeuwen, T. (2001). *Multimodal discourse: The modes and media of contemporary communication*. Arnold Publishers.
- Lotherington, H., & Jenson, J. (2011). Teaching multimodal and digital literacy in L2 settings: New literacies, new basics, new pedagogies. *Annual Review of Applied Linguistics, 31*, 226-246. <https://doi.org/10.1017/S0267190511000110>
- Mehndroo, M., & Vandana, V. (2020). Impact of motivation on academic achievement. *Ilkogretim Online - Elementary Education Online, 19*(4), 3316-3320. Retrieved from <https://ilkogretim-online.org/?mno=73952>
- Meier, C., Saor í, J. L., Le án, A. B. de, & Cobos, A. G. (2020). Using the Roblox video game engine for creating virtual tours and learning about the sculptural heritage. *International Journal of Emerging Technologies in Learning, 15*(20), 268-280. <https://doi.org/10.3991/ijet.v15i20.16535>
- Muslem, A., Sahardin, R., Heriansyah, H., Fata, I. A., Djalaluddin, Y., & Hankinson, E. (2022). YouTube teaching materials with peer support to improve students' mastery of subject content learning. *Studies in English Language and Education, 9*(2), 651-666. <https://doi.org/10.24815/siele.v9i2.25236>
- Mustafa, N. H., Hussein, N. H., Baba, S. (2020). English language problem-based learning via user-generated 3D world Roblox module: Need analysis. *Kresna Social Science and Humanities Research, 1*, 1-8. <https://doi.org/10.30874/ksshr.28>
- Özen, S. O. (2017). The effect of motivation on student achievement. In E. Karadag (Ed.), *The factors effecting student achievement* (pp 35-56). Springer. https://doi.org/10.1007/978-3-319-56083-0_3
- Rusman, Kurniawan, D., & Riyana, C. (2013). *Pembelajaran berbasis teknologi informasi dan komunikasi: Mengembangkan profesionalitas guru*. Rajawali Pers.
- Sari, Y. N., & Margana, M. (2019). YouTube as a learning media to improve the student's speaking ability in 21st century. *Journal of English Language Teaching and Linguistics, 4*(2), 263-273. <https://doi.org/10.21462/jeltl.v4i2.296>
- Simões Calvo, L. C., & de Oliveira Alonso, M. P. (2020). The internationalization of higher education and English in Brazil: A state-of-the-art study. In L. C. Simões Calvo, M. S. El Kadri, & T. P. Passoni (Eds.), *Language policies and internationalization of higher education institutions in Brazil: Contributions from applied linguists* (pp. 14-24). Pontes Editores.
- Sofyan, R., Tarigan, B., & Ganie, R. (2023). Need analysis for digital instructional materials of the Translation Theory course in Indonesia. *Studies in English Language and Education, 10*(1), 369-387. <https://doi.org/10.24815/siele.v10i1.25636>
- Sriyati, S., Mukhaiyar, M., & Rosa, R. N. (2019). The effect of using INSERT strategy and motivation on the reading comprehension of the second grade students of SMPN 11 Sijunjung West Sumatera. *International Journal of Civil Engineering and Technology, 1*(10), 1359-1368. Retrieved from https://iaeme.com/MasterAdmin/Journal_uploads/IJCIET/VOLUME_10_ISSUE_1/IJCIET_10_01_124.pdf
- Stern, M. J., Smyth, J. D., & Mendez, J. (2012). The effects of item saliency and question design on measurement error in a self-administered survey. *Field Methods, 24*(1), 3-27. <https://doi.org/10.1177/1525822X11419478>
- Taherdoost, H. (2019). What is the best response scale for survey and questionnaire design; Review of different lengths of rating scale / attitude scale / Likert scale. *International Journal of Academic Research in Management (IJARM), 8*(1), 1-10. Retrieved from <https://ssrn.com/abstract=3588604>
- Takahashi, D. (2020). *Roblox files for IPO, a first for user-generated game platforms*. Retrieved on November 21 2023, from <https://venturebeat.com/business/user-generated-game-platform-roblox-files-for-ipo/>
- Tican, C., & Deniz, S. (2019). Pre-service teachers' opinions about the use of 21st century learner and 21st century teacher skills. *European Journal of Educational Research, 8*(1), 181-197. <https://doi.org/10.12973/eujer.8.1.181>

- Tokan, M. K., & Imakulata, M. M. (2019). The effect of motivation and learning behaviour on student achievement. *South African Journal of Education*, 39(1), 1-8. <https://doi.org/10.15700/saje.v39n1a1510>
- Wu, Y. T., Foong, L. Y. Y., & Alias, N. (2022). Motivation and grit affects undergraduate students' English language performance. *European Journal of Educational Research*, 11(2), 781-794. <https://doi.org/10.12973/eu-jer.11.2.781>

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).