



The Student's Perceptions of Netflix Movies in Learning English to Improve Writing Skills on Vocational High School

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Article Info	Abstract
Article History Received: 2024-03-13 Revised: 2024-04-17 Published: 2024-05-01 Keywords: <i>Perceptions; Netflix; EFL; Writing Skill.</i>	This study investigates how students feel about using Netflix as an additional English language learning resource to improve their writing abilities in vocational high schools. The increasing significance of technology in education makes it necessary to understand the positive effects of non-traditional platforms such as Netflix when it comes to language learning. The study employs a qualitative approach, and interviews to gather insights from vocational high school students engaged in English language learning through Netflix. This article aims to investigate students' perceptions of the use of Netflix in the context of English language learning, and to investigate students' How does the use of Netflix contribute in the context of English language learning, particularly in the development of writing skills. The study findings will be the knowledge which can be implemented in the future prospect as the educator, specifically when facing the related problem about The Student Perceptions of Netflix in Learning English to Improve Writing Skills on Vocational High School.
Artikel Info	Abstrak
Diterima: 2024-03-13 Direvisi: 2024-04-17 Dipublikasi: 2024-05-01 Kata kunci: <i>Persepsi Siswa; Penggunaan Netflix; Bahasa Inggris Sebagai Bahasa Asing; Kemampuan Menulis Siswa.</i>	Penelitian ini menyelidiki bagaimana perasaan siswa tentang penggunaan Netflix sebagai sumber belajar bahasa Inggris tambahan untuk meningkatkan kemampuan menulis mereka di sekolah menengah kejuruan. Semakin pentingnya teknologi dalam pendidikan membuat kita perlu memahami efek positif dari platform non-tradisional seperti Netflix dalam hal pembelajaran bahasa. Penelitian ini menggunakan pendekatan kualitatif, dan memanfaatkan hasil wawancara untuk mengumpulkan wawasan dari siswa sekolah menengah kejuruan yang terlibat dalam pembelajaran bahasa Inggris melalui Netflix. Artikel ini bertujuan untuk menyelidiki persepsi siswa tentang penggunaan Netflix dalam konteks pembelajaran bahasa Inggris, dan untuk menyelidiki bagaimana penggunaan Netflix berkontribusi dalam konteks pembelajaran bahasa Inggris, khususnya dalam pengembangan keterampilan menulis. Temuan penelitian ini akan menjadi pengetahuan yang dapat diimplementasikan dalam prospek masa depan sebagai pendidik, khususnya ketika menghadapi masalah terkait tentang Persepsi Siswa tentang Netflix dalam Pembelajaran Bahasa Inggris untuk Meningkatkan Keterampilan Menulis di Sekolah Menengah Kejuruan.

I. INTRODUCTION

Since the 1960s, technology has gained attention as a mediational tool for teaching foreign languages (Blake, 2008; Warschauer & Healey, 1998). In this 20th century, technology has developed a lot, especially to support learning, especially learning English writing at the Vocational High School level. Technology is always developing and this growth has benefited language learning methods because there are many ways that can be used for those who want to learn English as a second language (ESL). one of them is the streaming service "Netflix" as a learning medium to improve writing skills in EFL. For that reason, language learning with streaming services of TV shows and movies on Internet-connected devices has been favored to adapt to the increasing number of language

learners as this method is much broader compared to the traditional notion of language learning, where utilizing technology in learning is more dynamic, social-centered, and entertaining (Dizon, 2021).

Technology is always developing, which has helped language learners by providing a multitude of options for people willing to acquire English as a second language (ESL). For these reasons, computer-assisted language learning (CALL) has gained popularity as a way to meet the needs of the growing number of language learners. Unlike the traditional concept of language learning, which emphasizes socially conscious, dynamic, and enjoyable language learning through the use of technology, CALL is a much broader approach (Dizon, 2021).

Online video streaming services like Netflix, which are designed to give customers more than just an entertainment option but also a platform to help them learn more about the English language, are among the various developments made. Due to the variety of real videos, this well-known online video streaming service has attracted a significant number of users (Dizon, 2016). In addition, the subtitles offered by Netflix for its videos assist viewers in properly understanding the language and context of the content. Rao (2019) claims that ESL students study English in a real-world setting and that watching English-language films is a common and effective way for them to grow as self-learners and independent thinkers. In addition, films made students want to watch videos with subtitles, gave them confidence in their ability to use these videos as a teaching tool, and gave them the opportunity to keep becoming better at speaking English (Athirah, 2019).

When it comes to teaching writing through media, teachers should select the best resources for their students depending on their learning styles and understanding of the characteristics of millennial learners. A variety of learning techniques must be used to improve their chances of picking up the language (Damanik & Katemba, 2021). Netflix is one of many platforms for learning English. Netflix has 183 million subscribers in over 190 countries that broadcast its members' documentaries, series, and movies via the internet (Arat & Simse, 2020; Türkmen, 2020).

For the past 10 years, on-demand video streaming services like Netflix, Hulu, and Amazon Prime Video have dominated popular culture. Language teachers and students now have much easier access to foreign language TV series and films, even if the use of video in the classroom was common even before the development of video streaming (Vanderplank, 2016). The video catalogues on these websites include hundreds of titles available in multiple languages, along with options for subtitling, making foreign-language media accessible to users of all ability levels. Movie screenings have been a common way for EFL students to advance their language skills since they are acknowledged as a very helpful tool for English language acquisition. (Damanik & Katemba, 2021; Nguyen & Stracke, 2020; Robert & Marpaung, 2022; Sinyashina, 2016).

English movies have already become an alternative tool to improve English language skills (Suetrong, 2015). The learners can also develop their language skills, critical thinking

skills and content knowledge capabilities through watching English movies (Chapple, 2000). Also, English movies are one of the good materials for providing cultural, educational, entertaining and accessible support in the process of learning and practicing English language (Tuncay, 2014). Using English movies to learn English language is a fast way to improve English language skills (Tahir, 2015). (Haouamria & Haridi, 2022).

Instead, learning is made easier by using these two channels at the same time. This is because, unlike verbal or written information itself, an audiovisual presentation allows input to be processed by both the verbal and visual systems, freeing up more cognitive resources for information processing (Brü nken et al., 2002).

According to Heaton (1998:135), teaching writing skill can be difficult at times and requires mastery of both grammatical and rhetorical techniques as well as intellectual and judgmental components. Heaton claims that the responsibility of a teacher in teaching writing is to choose whether the skill should be made "easy" or "difficult." Creating educational resources and media is one way to help students become better writers. One approach to teaching writing skills through educational media is to use English-language films. Perhaps with the aid of this instructional medium, both the teacher and the students will be more excited about the process of teaching, the teacher will be able to explain the writing material clearly, and the students will find it easier to understand.

Richard (2013) asserts that writing is a means to transfer ideas from the mind into written form. Writing is also a form of communication used to express thoughts or messages in written form (Renaldi, 2017). One of the language skills that is very important in learning a language is writing. Writing is a basic ability in language that is as important as listening and reading, according to Harmer (2006, p. 79-80).

According to the background of the research that has described, the researcher identifies the research problem as:

1. To identify the perceptions of students majoring in Visual Communication Design (DKV) at SMK Budhi Warman 2 towards watching films on the Netflix platform that are in English to develop writing skills.
2. To identify how does the use of Netflix contribute for student in Visual Communication Design (DKV) at SMK Budhi Warman 2 to English writing among vocational high schools.

This study is primarily focussed to find out how 10 DKV students in BW 2 Vocational High School Jakarta experience using Netflix as an additional resource for English writing practice. Therefore, I will collect more accurate research data through qualitative investigation. The participants in this study were 10 DKV class students in BW 2 Vocational High School Jakarta Indonesia who were invited from the English Education Programme. The participants of this study are still in the 10th grade of Vocational High School. Although they are very focused on their study journey, the participants have had the experience of learning through Netflix to support their writing proficiency.

Table 1. Watching Netflix Duration

Below 1 Year	1 Year – 2 Years	3 Years – 5 Years	More than 5 Years
4 Respondents	2 Respondents	4 Respondents	-

II. METHOD

This research conducted in Budhi Warman II Vocational High School which located in Raya Bogor Street. 28, Pekayon, Ps. Rebo, East Jakarta City, DKI Jakarta – 13710. English and Indonesian were the two languages spoken during this conversation. This is done to make the questions easier for the participants to understand and enable them to respond to the questions with accuracy. Distinguished between different categories of interview questions Guba and Lincoln (2002). (Roberts, 2020)

Table 2. Instrument of Interview

No	The Perceptions of Netflix in Learning English
1.	In your opinion, why do you use Netflix to learn English?
2.	How do you think Netflix can affect learning English?
3.	In your opinion, how do you use Netflix to help you learn English?

No	The Perceptions of Netflix Contribute to English writing
1.	In your opinion, are there any contributions that can have an impact on improving English language? (if yes why & if not why)
2.	In your opinion, which things can improve your writing skills after watching Netflix?
3.	Do you believe that Netflix can help to improve your writing skills? (If yes why and if no why)

In table 2.1 showed the interview instrument was adapted from Dr Sugiyono's research book entitled "Quantitative and Qualitative Research Methods". (Prof. Dr. Sugiyono, 2016). This is a qualitative descriptive study which presents a description of a phenomenon and intended to

explore and explain the event in the social environment (Nassaji, 2015). Qualitative research was used to analyze the data in this study. To study and explain how "The Student Perceptions of Netflix in Learning English to Improve Writing Skills in Vocational High School Budhi Warman 2", qualitative data was used. Participants' data were collected in their natural environment using qualitative data instruments in the form of semi-structured interviews. "Vocational High School Visual Communication Design Students" in Budhi Warman II can refer to a high school that offers vocational education with a focus on design and visual communication. Students at such a school will most likely receive training in practical aspects of design, visual communication techniques, and possibly skills related to specific industries such as graphic design, multimedia, or other visual arts.

The researcher employed a purposive sample in order to collect the research sample. Purposive sampling is a non-random selection strategy in which the researcher selects samples based on particular qualities that align with the goals of the study and will probably to address research questions. Documentation and individual interviews are used in the collection process. When an interviewer chooses to explore further and ask follow-up questions to collect additional information, the individual interview is a relevant technique. Semi-structured interviews provided the interview guide for the data collection in this study. Open-ended questions were used as part of the interview technique to encourage interaction between the interviewer and the respondents. The respondents were also allowed to freely express their opinions on the relevant topic. When conducting this interview, two languages were used: English and Indonesian. This helps the participants understand the questions more clearly and provide proper replies to the questions asked. Contains how data is collected, data sources and ways of data analysis.

III. RESULT AND DISCUSSION

A. Result

This research conducted in Budhi Warman II Vocational High School which located in Raya Bogor Street. 28, Pekayon, Ps. Rebo, East Jakarta City, DKI Jakarta-13710. This research was conducted on 26th February 2024 at Budhi Warman II Vocational High School majoring in Visual Communication Design. The research was conducted through interviews and documentation with the

research subjects. The research results were analysed by researchers using descriptive qualitative method, which means that the researcher described, and interpreted all the data collected so that they were able to obtain a general and comprehensive situation.

1. Description of SMK Budhi Warman II Jakarta

SMK Budhi Warman II is a vocational school that can focus on supporting the world of work and university. As a vocational high school SMK Budhi Warman II has 4 study programmes, there are Visual Communication Design (DKV), Accounting Expertise Programme (AKL), Office Administration Expertise Programme (OTKP) and Computer Network Engineering (TKJ). Based on the school profile SMK Budhi Warman II Founded 13 January 1990 which located in Raya Bogor Street. 28, Pekayon, Ps. Rebo, East Jakarta City, DKI Jakarta – 13710.

2. Description of the subject

The subjects in this research were students of SMK Budhi Warman II Jakarta class X Visual Communication Design Students who actively and long-time use Netflix. There were 10 students consisting of 3 male students and 7 female students and they came from same majors.

3. Description of the Research Results

After the researchers conducted research using the method interviews and documentation related to the title of the research, namely "The Student Perceptions of Netflix in Learning English to Improve Writing Skills in Vocational High School". In this section the researchers will represents the results and discussions on "The Students Perceptions of Netflix in Learning English to Improve Writing Skills". Problem in Answering "The Perceptions of Netflix in Learning English to Improve Writing Skills". The researcher briefly described the research findings that had been carried out by the researcher. Based on the results of the research, it shows that in formal education institutions, namely SMK Budhi Warman II, especially students of class X have actually use Netflix in Learning English to Improve Writing Skills, but not all students could take interview because only students who have passed the selection by document semester report

scores who could take the interview. Therefore, based on the data that the researchers found when conducting preliminary research, there were only 10 students out of 42 students who successfully passed the document selection. After the researcher conducted interviews with 10 students who were the subjects of this research, the researcher found that this problem also occurred when they answered the Instrument of Interview Perceptions of Netflix in Learning English to Improve Writing Skills. The students' Perceptions of Netflix in Learning English to Improve Writing Skills could be seen in the following table:

Results are the main part of scientific articles, containing: final results without data analysis process, hypothesis testing results. Results can be presented with tables or graphs, to clarify the results verbally.

Table 3. Demographics of Respondents

Respondent Code's	Gender	Major/Department
R1	Female	Visual Communication Designs
R2	Female	Visual Communication Designs
R3	Female	Visual Communication Designs
R4	Male	Visual Communication Designs
R5	Male	Visual Communication Designs
R6	Female	Visual Communication Designs
R7	Female	Visual Communication Designs
R8	Female	Visual Communication Designs
R9	Male	Visual Communication Designs
R10	Female	Visual Communication Designs

Table 4. Perceptions of Netflix in Learning English to Improve the Language Skills

why do you use Netflix to learn English?	How do you think Netflix can affect learning English?	how do you use Netflix to help you learn English?
R2 "Because there are usually some vocabulary words that I don't understand or are still unfamiliar to me, I can learn them	R3 "Yes, it can. Because usually if I watch Netflix I can get new words and it's also difficult to	R1 "We can follow along with it to help us understand what's being said in the film and what's being said in

and write them down, especially for new vocabulary.” R4 “I consider Netflix as my guide or lesson in English. There are various languages in Netflix, for example English, Mandarin, there is also Indonesian, just from all over the country, international. I take it from English.” R6 “because there are various languages on Netflix, especially English, so when I watch Netflix, I often use English subtitles.” R7 “Actually, it can, because in Netflix there are many foreign films. For example, there are American films, British films, and other films from other countries. So, from there you can improve the ability to speak English. So in my opinion, Netflix is useful for improving learning English.”	write. So yes, I can do it. Because those words are not usually learnt at school so there are a lot of new vocabulary.” R5 “it does. So, when I was watching Netflix, I watched a film. In that film, there were some English words that I didn’t know, I didn’t understand the meaning of. And then I just find the meaning of it.” R7 “from watching films with subtitles. So, I know what it is, how the word is written and how it is read and its meaning. Well, of course, from the subtitles, it can improve my writing skills because with subtitles it can increase our vocabulary.”	the world so it’s not just the sound of the subtitles. It can also help us to memorise or remember or write because it’s obvious that we want it to be a learning concept.” R3 “It’s like watching a lot of foreign films that speak English. Then it can help develop our skills too from what I said earlier like new words. Then like how to write the words too.” R10 “I watch a lot of foreign films using English rather than others to improve skills, the most important thing is to use subtitles because the pronunciation method sometimes there must be new foreign ones and of course the subtitles are in English.”	watch it twice. Sometimes Indonesian first, then English. So, I understand the English subtitles first, then later in English I’m like “oh this is the vocabulary”. R4 “it has subtitles. We can just copy from the text, so it’s possible. I also sometimes don’t activate the subtitles. So, there I learn without subtitles, and I listen. But sometimes I switch them on.” R6 “There can be, when I watched Netflix, it was like Oh it turns out that the use of words is good, it’s good to be like this, like this Then for a long time I wrote more and more often Than I became confident in uploading my own writing. Yes, absolutely. That’s right, the first vocabulary bar. Well, from the new vocabulary, I will study it again, then I will make it into a story. Well, later I will upload the story. Well, I uploaded it. So I wrote a lot From the vocabulary, then from the structuring of the word, I am from Netflix to write a piece of my writing.” R8 “there are vocabularies that we don’t understand in a text in the subtitles So we can translate-in After that look, after that write from the subtitles.”	then word placement again. That’s really what makes my writing skills develop from year to year, it’s more about structuring vocabulary, and word retrieval, we have to be smart in sorting out the words.” R9 “Of course, the use of English subtitles is really helpful for helping our English writing. so, we can also know the correct writing, how to do it.” R10 “From subtitles again. well, subtitles really have an impact. So, from the subtitles, I can be helped to improve my writing skills.”	vocabulary, I learnt about it, how to pronounce it, and how to write it.” R6 “Believe it. Because I used to like watching films, right Now I often watch films, I want to have aspirations to become a writer So it’s like how can I become a writer, finally I try to like watching Oh so I explore what’s in the film like the use of words, vocabulary Well, after that I just made it into writing thanks to this Netflix So I understand how to do it, how to arrange the words in addition to Netflix. So, I believe Netflix can help improve my writing skills.” R8 “I believe, because from the films that I like I can write their conversations so I can be diligent because I often watch them too. Netflix It can be very helpful too to motivate us to write.” R9 “The use of subtitles, and then also sometimes in certain films, the characters are shown writing letters and all kinds
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Table 3. Perceptions of Netflix in Learning English to Improve Writing Skills

Are there any contributions that can have an impact on improving writing skill?	Which things can improve your writing skills after watching Netflix?	Do you believe that Netflix can help to improve your writing skills? (If yes why and if no why)
R2 “yes it can, it really can. in my opinion because it has English subtitles. I usually	R6 “from new vocabulary that I see on Netflix, and	R2 “I really believe it. because from subtitles I can get a new

*of things, so
we can learn
from the
letters written
by the
characters."*

B. Discussion

Based on the research data that the researchers have presented previously to investigate what are the problems or obstacles students have in answering the students' Perceptions of Netflix in Learning English to Improve Writing Skills. The data collected for this study was from interviews using a semi-structured interview as the interview guide. The protocol during the interview session was open-ended questions which allowed engagement between the interviewer and the respondents. The results will be described in the following further discussion below.

1. The Understanding and How Long-Time Actively of Netflix

From the results of the researcher interviews with 10 DKV students of SMK Budhi Warman II the results show that many of them understand the Netflix platform and also many uses Netflix to learn English. They are active until now; they are still in SMK.

2. How Netflix Can Influence in Learning English

The results showed that students' shows that students' perceptions that Netflix is very helpful and very useful for learning English. students' enthusiasm for Netflix is very high for learning English. from the responses of students, all of them think that Netflix is very useful for learning English and can improve writing skills.

Educational Series: Educational Series: Develop or offer educational movies that concentrate on writing and language skills in particular. These shows can be made to make studying vocabulary, grammar, and writing skills interesting and fun.

3. How Netflix Can Influence and Contribute to Improve Writing Skill

a) Subtitle Education.

It is recommended that students consume content with subtitles and in a language other than their native tongue. Their vocabulary, grammar, and sentence structure can all be improved by this.

To help viewers acquire new languages, give them the choice to switch between subtitles in their own tongue and the language of the video.

b) Original Text.

Emphasize the Netflix original films and television shows that are known for their excellent writing. Highlight the writing of gifted authors and illustrate the power of effective narrative. Make instructional resources focused around original material, like debate guidelines or writing exercises concerning particular shows or films. Discussion is the most important part of the entire contents of scientific articles. The objectives of the discussion are: answering research problems, interpreting findings, integrating findings from research into existing sets of knowledge and composing new theories or modifying existing theories.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

Based on research results and discussion, there are several points from the results and discussion about the students' perceptions of Netflix in learning English to improve writing skills at SMK Budhi Warman II which would be conclude as follows:

Based on the data collection and analysis shows that, students' perspectives on Netflix to help students learn to understand English and the contribution to improving writing skills are very significant. From the perceptions of the students who have been interviewed, all of them think that Netflix can help to learn English and can help improve their writing skills. subtitles and conversion in Netflix movies are one of the most influential contributions to help learn English and improve English writing skills. because from the subtitles and conversation, students can know good vocabulary so that they can be implemented into their writing or help them know when they feel wrong with what they have not understood so far. with a lot of practice and often watching English movies, students will continue to be able to improve their writing skills.

B. Suggestion

Students can use speech or situations from shows or films as a source of inspiration for writing assignments in addition to watching.

They can attempt to pick up the plot from a specific point or reconstruct the scene in their own words. It is believed that by putting these recommendations into practice, students will find that using Netflix may be a useful tool for developing their English writing skills in a relevant and enjoyable way.

REFERENCES

- Chetia, B., & Bhatt, D. (2021). The film life of pi as a multimedia tool in English language classrooms of engineering colleges in Gujarat- An ESP approach. In Rupkatha Journal on Interdisciplinary Studies in Humanities (Vol. 12, Issue 5). Aesthetics Media Services. <https://doi.org/10.21659/RUPKATHA.V12.N5.RIOC1S23N6>
- Damanik, I. J., & Katemba, C. V. (n.d.). NETFLIX AS A DIGITAL EFL LEARNING AID FOR VOCABULARY IMPROVEMENT: COLLEGE STUDENTS' PERSPECTIVE.
- Dengel, A., Gehrlein, R., Fernes, D., Görlich, S., Maurer, J., Pham, H. H., Großmann, G., & Eisermann, N. D. genannt. (2023). Qualitative Research Methods for Large Language Models: Conducting Semi-Structured Interviews with ChatGPT and BARD on Computer Science Education. Informatics, 10(4). <https://doi.org/10.3390/informatics10040078>
- Fatihah Shahril, N., Teknologi MARA, U., Alam, S., Darul Ehsan Nor Eleyana Abdullah, S., & Darul Ehsan, S. (2022). University Students' Perceptions on Netflix and Subtitles for English as a Second Language Learning. In Journal of Creative Practices in Language Learning and Teaching (CPLT) (Vol. 10, Issue 2).
- Godwin-Jones, R. (2021). Evolving technologies for language learning. In Language Learning & Technology ISSN (Vol. 25, Issue 3). <http://hdl.handle.net/10125/73443>
- Haouamria, R., & Haridi, M. S. (2022). People's Democratic Republic of Algeria Ministry of Higher Education and Scientific Research Option: Linguistics A Dissertation submitted to the Department of Letters and English Language in Partial Fulfillment of the Requirements for the Degree of Master in Language and Culture Investigating EFL
- Student's Attitudes towards the Impact of English Movies on Proficiency Improvement.
- Hasby, M. A. (2021). The English Movies Watching Reports to Improve Students' Writing Performance, Does It Work? English Department of UMMU Journal (EDU Journal), 1(2). <http://www.jurnal.umm.ac.id/index.php/edu>
- Kuscu-Ozbudak, S. (2022). The role of subtitling on Netflix: an audience study. Perspectives, 30(3), 537–551. <https://doi.org/10.1080/0907676X.2020.1854794>
- Manullang, H. E., & Katemba, C. V. (2023). STUDENTS' PERCEPTION TOWARD INSTAGRAM USAGE IN WRITING SKILL (Vol. 17, Issue 1). <http://ejournal.uika-bogor.ac.id/index.php/ENGLISH>
- Mutoharoh, A., 'Ulya, A. Z., Nawangsari, E., Fatin, S. R., & Mualim, M. (2022). Use of YouTube As A Medium for Teaching English Writing Skill During Covid-19 Pandemic. Tarling : Journal of Language Education, 5(2), 129–147. <https://doi.org/10.24090/tarling.v5i2.5748>
- Prof. Dr. Sugiyono. (2016). Metode Penelitian Pendidikan (23rd ed.). Alfabeta.
- Roberts, R. E. (2020). Qualitative interview questions: Guidance for novice researchers. In Qualitative Report (Vol. 25, Issue 9, pp. 3185–3203). Peace and Conflict Studies. <https://doi.org/10.46743/2160-3715/2020.4640>
- Rodríguez-Peñarroja, M. (n.d.). INTEGRATING PROJECT-BASED LEARNING, TASK-BASED LANGUAGE TEACHING APPROACH AND YOUTUBE IN THE ESP CLASS: A STUDY ON STUDENTS' MOTIVATION. In Teaching English with Technology (Vol. 22, Issue 1). <http://www.tewtjournal.org>
- Sánchez-Auñón, E., Férez-Mora, P. A., & Monroy-Hernández, F. (2023). The use of films in the teaching of English as a foreign language: a systematic literature review. In Asian-Pacific Journal of Second and Foreign Language Education (Vol. 8, Issue 1). Springer Science and Business Media B.V.

<https://doi.org/10.1186/s40862-022-00183-0>