Effect of YouTube Videos on Concept Understanding of the Students of Grade Eight in the Subject of General Science

Aftab Ahmad Khan
Ph.D, Lecturer, Department of Education, University of Jhang.
Email: tabijan71@gmail.com

Ume Haseeba
M. Phil. Scholar, Department of Education, University of Jhang.
Email: umehaseebaanwar@gmail.com

Zeshan Umar
M. Phil. Scholar, Department of Education, University of Jhang.
Email: zeshan.Umar1122@gmail.com

Received on: 29-04-2024 Accepted on: 30-05-2024

Abstract

This study aimed to develop concept understanding in the students of 8th grade through the use of YouTube videos as a teaching method. The population of the study consisted of female students studying in grade eight from public sector schools of district Jhang. Two public sector girls' elementary schools were randomly selected and their students of grade eight served as sample of the study. The researcher developed an achievement test from the textbook of grade eight General Science. The said test was used as a tool for data collection. The tool consisted of three major items and their sub-parts. After administering the pre-test the sample classes were randomly assigned to as the control group (22 students) and the experimental group (23 students). After the termination of the treatment, data was analyzed. The results showed that equal ability students of experimental group performed better after the treatment. To respond a question they used words and phrases beyond the textbook. It was observed that students love to watch videos, which not only helped them learn complex concepts but also helped them improve their listening and punctuation skills. It was also observed that students retain their attention in the classroom. Hence it was concluded that by using YouTube videos as teaching method, enhanced concept understanding of students of experimental group.

Keywords: YouTube, videos, Classroom, Concept Understanding, Students, Learning Abilities, Teaching Methods.

Introduction

Concept understanding of our students is weak. The researcher's experience in the field revealed that Pakistani students struggle with weak conceptual understanding due to several factors. The education system's reliance on rote learning, traditional lecture-based teaching methods, and an overloaded curriculum limit students' ability to engage deeply with concepts. Language barriers, particularly when English is used as the medium of instruction, further hinder comprehension. Resource constraints, including inadequate access to educational materials and insufficient teacher training, exacerbate the problem, especially in rural areas. Socio-economic disparities also contribute, as students from less privileged backgrounds may have limited access to quality education. The exam-oriented system prioritizes memorization over conceptual understanding, and cultural attitudes that discourage questioning further impede deep learning. Addressing these issues requires comprehensive reforms in teaching practices, curriculum design, assessment methods, and resource allocation.

One of the contributing factors towards weak concept understanding is the use of passive methods of teaching like lecture-based methods and the reliance on rote learning. Research proves use of YouTube videos is an active method to be used in the classroom (Rahmatika, Yusuf, & Agung, 2021; Kohler, & Dietrich, 2021; Wahyuni, Utami, & Education, 2021; and Farag, Bolton, & Lawrentschuk, 2020).

Owing to the potential of YouTube videos, current study was designed. This research explored the use of YouTube videos in daily classroom teaching to enhance students' conceptual understanding in general science. YouTube videos are popular among students because they help simplify complex ideas while also improving punctuation and listening skills.

Statement of the problem

The current study is an effort to examine the effect of YouTube videos on concept understanding of the students of grade 8th in the subject of general science".

Objectives of the study

The following were the objectives of the study:

1. To determine 8th grade students' baseline comprehension of General Science concepts.
2. To ascertain how YouTube videos affect eighth-grade students' conceptual understanding of general science.

Review of Related Literature

In this era, students are always engaged in the social media websites, that is why these technologies must not be ignored by teachers , social media is a better way to communicate with students (Ferris and wilder 2013). It can enhance educational outcomes.

Digital media is continuously bringing interactive and unique facilities to coming generation. Students are extra engaged in the social media websites that is why these technologies must not be ignored (Ansari, & Khan, 2020; Ferris and wilder 2013). Social media does not use social networking platform such as Facebook to communicate with students; rather, it uses

all kinds of technology to communicate with various communities.

YouTube is YouTube is commonly used digital media tool and the second-most-visited website in the world (Lu, 2023; Nayaki, & Amuthanayaki, 2023; Sui, Sui, & Rhodes, 2022); Liu, 2020; Arthurs, Drakopoulou, & Gandini, 2018), and today many teachers and learners use YouTube for educational purposes (Pattier, 2021; Pratama, Arifin, & Widianingsih, 2020; Sakkir, Dollah, & Ahmad, 2020; Binmahboob, 2020). It has been found that YouTube videos offer effective directions, approaches, and recommendations to achieve educational benefits (Pratama et al., 2020; Wu, Hou, Zhu, Zhang, & Peha, 2002). It is a valuable addition to the classroom and makes it easier for students to access necessary learning and concepts in the classroom (Maziriri, Gapa, & Chuchu, 2020). More difficult concepts and points can be explained shortly and interestingly. It keeps students engaged and connected to learning (Shoufan, & Mohamed, 2022; Roddt & Peier 2013). Using YouTube videos is an innovative and effective tool for enhancing student achievement and making teaching material more engaging and relatable (Pratama et al., 2020; Almurashi, 2016).

In case of virtual classroom, YouTube video is a great addition to the classroom (Manegre, & Sabiri, 2022; Jiménez, Ponce, & Vázquez-Cano, 2021). This makes it easier for students to access necessary learning and concepts in the classroom. More difficult concepts and points can be explained shortly and interestingly through YouTube videos than in textbooks and short notes (Pires, Masanet, & Scolari, 2021; Ndihokubwayo, Uwamahoro, & Ndayambaje, 2020). The use of YouTube videos in education has been shown to improve students' attitudes towards the content and learning process, leading to enhanced performance (Adipat, Laksana, Busayanon, Asawasowan, & Adipat, 2021). This approach is particularly beneficial for students who struggle with traditional textbook learning, helping them become more effective and engaged learners. Teaching in the classroom using YouTube YouTube videos helps students recall their old information and knowledge with greater clarity (Yaacob, Amir, Asraf, Yaakob, & Zain, 2021; Pratama et al., 2020).

Methodology

The study was quasi-experimental in nature and Nonequivalent control group design was used.

Population

The population of the research comprised female students in 8th grade in public sector female elementary schools in district Jhang during the session of 2023–2024.

Sample of the Study

Two female elementary schools were randomly selected, using a simple random sampling technique. The selected schools were typical government schools. Two intact classes from these schools were included in the sample. These classes were randomly assigned to as control and experimental groups. The Experimental group included 23 female students, and the control group included 22 female students.

Duration of the Study

Duration of the study was six weeks. The experimental group students were taught by the

researcher using YouTube videos. Another teacher with similar qualification and experience taught the control group using routine talk and chalk method.

In order to ensure the generalizability, a number of other were taken care of, for example, selected schools were representative of typical public sector schools with similar facilities in schools, the school environment, the socioeconomic status of the students, their family background, teacher qualifications, the process of teachers recruitment and promotion, the supplies of the AV aid, etc.

Instruments of the Research

The researcher used self-developed test for measuring concepts of general science. The test was developed on the basis of constructed response question pattern. The instrument was validated using the opinions of the experts in the field.

Analysis

Table 1 *Comparison of the control and experimental group before the treatment on items relating to the analysis of a given situation*

Title	T-score	Group	N	Mean	SD	*t*	*df*	*p*
Items relating to the analysis of the given situation	20	Control	22	5.91	2.92	-2.85	43	.18
		Experimental	23	3.48	2.77			

Table 1 shows a comparison between the mean scores of the control and experimental groups on pretest items relating to the Analysis of a given situation. The Levene's Test for Equality of variances gives the value of significance equal to .35, which was greater than .05, so equal variance was assumed. The *p*-value for both control and experimental groups was .18 [N =22, Mean = 5.91, SD = 2.92; for the control group and N = 23, Mean = 3.48, SD = 2.92. For the experimental group], t (43) = -2.85 at p > .05. As the p-value was greater than .05, there was no statistically significant difference between the groups before treatment in items relating to the Analysis of the given situation.

Table 2 *Comparison between the control and experimental group before the treatment in provoking thought process*

Title	T-score	Group	N	Mean	SD	*t*	*df*	*p*
Provoking thought process.	20	Control	22	6.73	2.18	1.52	43	.13
		Experimental	23	8.09	3.59			

Table 2 shows a comparison between the mean scores of the control and experimental groups on pretest items relating provoking thought process. Levene's Test for Equality of variances gives value equal to .30, which was greater than .05, so equal variance was assumed. The *p*-value for both control and experimental groups was .13, [N = 21, Mean =6.73 and SD = 2.18

for the control group and N = 23, Mean = 8.09, and SD = 3.59] for the experimental group. *t* value for both control and experimental groups was t (43) = 1.52 at p > .05]. As the p-value was greater than .05, so there was statistically no significant difference between the groups before the treatment on items for provoking thoughts.

Table 3 *Comparison between the control and experimental groups before the treatment for the connection of scientific processes to daily life*

Title	T-score	Group	N	Mean	SD	*t*	df	*p*
Connection of scientific process to daily life.	10	Control	22	1.41	.73	2.56	43	. 10
		Experimental	23	1.39	.64			

Table 3 shows comparison between the mean scores of the control and experimental groups on pretest items for the connection of scientific process to daily life. Levene's Test for Equality of variances gives a significance value equal to .11, which was greater than .05, so equal variance was assumed. The *p*-value for both control and experimental groups was .10 [N = 21, Mean = 1.41 and SD = .73 for the control group and N = 23 Mean = 1.39, SD = .64 for the experimental group. t value for both control and experimental groups was t (43) = 2.56 at p > .05]. As the p-value was greater than .05, so there was statistically no significant difference between the groups before the treatment on items relating to the connection of scientific process to daily life.

Table 4 *Comparison between the experimental and control group after the treatment on items relating to Analysis of a given situation*

Table 4 shows a comparison, after treatment, between the mean scores of the control and experimental groups on items relating to the Analysis of a given situation. Levene's Test for

Title	T-score	Group	N	Mean	SD	*t*	*df*	*p*	*Eta*^{2}
Items relating to the analysis of the given situation	20	Control	22	7.95	3.40	10.01	38.0	.00	0.69
		Experimental	23	16.82	2.44				

Equality of variances gives the value of significance equal to .04, which was less than .05, so equal variance was not assumed. The *p*-value for both control and experimental groups was .00 [N = 22, Mean = 7.95, SD = 3.40, for the control group and N = 23, Mean = 16.82, SD = 2.44 for the experimental group], t (38.0) = 10.01 at p < .05. As p-value was less than .05, there was a statistically significant difference between the groups after the treatment in items relating to Analysis of a given situation. The magnitude of the effect (Eta^2) was 0.69. This was a very large effect that showed the better achievement of the experimental group after the treatment.

Table 5 *Comparison between the control and experimental group after the treatment of provoking thought process*

Title	T-score	Group	N	Mean	SD	*t*	*df*	*p*	*Eta²*
Provoking thought process.	20	Control	22	8.72	2.99	6.85	39.06	.00	0.52
		Experimental	23	16.34	4.36				

Table 5 shows a comparison, after treatment, between the mean scores of the control and experimental groups on items provoking thought processes. Levene's Test for Equality of variances gives significance value equal to .01, which is less than .05, so equal variance was not assumed. The *p*-value for both control and experimental groups was .00, [N = 21, Mean =8.72 and SD = 2.99 for the control group and N = 23, Mean = 16.34, and SD = 4.36] for the experimental group. t value for both control and experimental groups was t (39.06) = 6.85 at p < .05]. As the p-valuable was less than .05, so there was a statistically significant difference between the groups after the treatment on items for provoking thought processes. The magnitude of the effect (Eta^2) was 0.52. This was a very large effect which shows the better achievement of the experimental group after the treatment.

Table 6 *Comparison between the control and experimental group after the treatment on item relating to the connection of scientific process to daily life*

Title	T-score	Group	N	Mean	SD	*t*	df	*p*	Eta^2
Connection of scientific process to daily life.	10	Control	22	4.18	1.14	10.65	37.63	.00	0.72
		Experimental	23	8.91	1.78				

Table 6 shows a comparison, after the treatment, between mean scores of the control and experimental groups on items for connection of scientific process to daily life. Levene's Test for Equality of variances gives a significance value equal to .01, which was less than .05, so equal variance was not assumed. The *p*-value for both control and experimental groups was .00 [N = 21, Mean = 4.18 and SD = 1.14 for the control group and N = 23 Mean = 8.91, SD = 1.78 for the experimental group. t value for both control and experimental groups was t (37.63) = 10.65 at p > .05]. As the *p*-value was less than .05, so there was a statistically no significant difference between the groups after the treatment. The magnitude of the effect (Eta^2) was 0.72. This was a very large effect showing the experimental group's better achievement after the treatment.

Discussion

Before treatment, there was statistically no significant difference the scores of the students of control and experimental groups. It means that both groups performed nearly identically. After the treatment, performance of the students of experimental group was significantly higher than that of students of the control group, with a larger effect size. Their performance was better due to the teaching using YouTube videos. Through YouTube videos, teacher facilitated the students learning and made complex concepts easy for them. This enabled

learners to understand concepts and enhance their ability to understand concepts. During the experiment, students showed a great interest in classroom learning. Students became very happy when they watched videos related to the topic. They chose many more YouTube videos related to their items for analysis of the situations, provoking thought Process, and the connection of scientific Processes to daily life. Through the use of YouTube videos, student's interest level was high, and they were motivated. On the other hand, students developed skills like listening, watching, communication, and language.

YouTube videos include step-by-step instructions that can be easily followed to understand the concept. This is evident from the high mean achievement score of the experimental group students. These results are in alignment with Pires, Masanet, & Scolari 2021; Adipat, Laksana, Busayanon, Asawasowan, & Adipat, 2021; Ndihokubwayo, Uwamahoro, & Ndayambaje, 2020.

Conclusions

The students of the control and experimental groups performed nearly equally before the treatment on items relating to analyzing the given situation, provoking thought processes, and connecting scientific processes to daily life, as shown in the 8th grade General Science textbook. After the treatment, the mean achievement of the students of the experimental group was higher on all the stated items, as compared to the students of the control group.

On the basis of the findings of the study, it was concluded that using YouTube videos in classroom has a significant effect on making students understand the content they learn. Such YouTube videos enhanced the understanding of the academic materials and develop the student's concepts in a better way. Use of YouTube videos was under the supervision of the teacher. This classroom activity enhanced their interest and has given rise to a powerful understanding. While answering to the questions on the posttest, students of experimental group didn't reproduced the bookish language and used words and ideas from their everyday life experiences. This again indicates that using YouTube videos has contributed to developing understanding concepts included in General Science textbook. This provides evidence that using YouTube videos is a better method for developing concept understanding in learners.

Recommendations

On the basis of findings and conclusion of the study following recommendations are made:

1. School administrators make arrangements for using YouTube videos in the classrooms.
2. They should develop a source bank of YouTube videos and provide links of the videos in a catalog book so that the teacher can find relevant videos easily.
3. Curriculum developers should recommend useful YouTube videos relevant to each topic included in the curriculum.
4. Textbook writers should add links to YouTube videos related to the topic at the end of each chapter.

References

1. Almurashi, W. A. (2016). The effective use of YouTube videos for teaching English language in classrooms as supplementary material at Taibah University in Alula. *International Journal of*

English Language and Linguistics Research, *4*(3), 32-47.

2. Ferris, S. P., & Wilder, H. A. (2013). The Plugged-In Professor: Tips and Techniques for Teaching with Social Media. *Oxford, UK, Chandos Publishing*
3. Wu, D., Hou, Y. T., Zhu, W., Zhang, Y. Q., & Peha, J. M. (2001). Streaming video over the Internet: approaches and directions. *IEEE Transactions on circuits and systems for video technology*, *11*(3), 282-300. DOI: https://doi.org/10.1109/76.911156
4. Yaacob, A., Amir, A. S. A., Asraf, R. M., Yaakob, M. F. M., & Zain, F. M. (2021). Impact of YouTube and Video Podcast on Listening Comprehension among Young Learners. *International Journal of Interactive Mobile Technology*, *15*(20), 4-19. DOI: https://doi.org/10.3991/ijim.v15i20.23701
5. Pratama, S. H. H., Arifin, R. A., & Widianingsih, A. W. S. (2020). The use of YouTube as a learning tool in teaching listening skill. *International Journal of Global Operations Research*, *1*(3), 123-129. DOI: https://doi.org/10.47194ijgor.v1i3.50
6. Adipat, S., Laksana, K., Busayanon, K., Asawasowan, A., & Adipat, B. (2021). Engaging students in the learning process with game-based learning: The fundamental concepts. *International Journal of Technology in Education*, *4*(3), 542-552. DOI: https://doi.org/10.46328/ijte.169
7. Ndihokubwayo, K., Uwamahoro, J., & Ndayambaje, I. (2020). Effectiveness of PhET simulations and YouTube videos to improve the learning of optics in Rwandan secondary schools. *African Journal of Research in Mathematics, Science and Technology Education*, *24*(2), 253-265. DOI: https://doi.org/10.1080/18117295.2020.1818042
8. Pires, F., Masanet, M. J., & Scolari, C. A. (2021). What are teens doing with YouTube? Practices, uses and metaphors of the most popular audio-visual platform. *Information, communication & society*, *24*(9), 1175-1191. DOI: https://doi.org/10.1080/1369118X.2019.1672776
9. Manegre, M., & Sabiri, K. A. (2022). Online language learning using virtual classrooms: An analysis of teacher perceptions. *Computer Assisted Language Learning*, *35*(5-6), 973-988. DOI: https://doi.org/10.1080/0958821.2020.1770290
10. Jiménez, M. A. S., Ponce, P., & Vázquez-Cano, E. (2021). YouTube videos in the virtual flipped classroom model using brain signals and facial expressions. *Future Internet*, *13*(9), 224. DOI: https://doi.org/10.3390/fi13090224
11. 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 and English Literature*, *9*(6), 13-22. DOI: https://doi.org/10.7575/aiac.ijalel.v.9n.6p.13
12. Sakkir, G., Dollah, S., & Ahmad, J. (2020). Students" perceptions toward using YouTube in EFL classrooms. *Journal of Applied Science, Engineering, Technology, and Education*, *2*(1). DOI: https://doi.org/10.35877/454RI.asci2125
13. Pattier, D. (2021). Teachers and YouTube: The use of video as an educational resource. *Ricerche di Pedagogia e Didattica. Journal of theories and research in Education*, *16*(1), 59-77. DOI: https://doi.org/10.6092/issn.1970-2221/11584
14. Nayaki, N. K., & Amuthanayaki, V. P. (2023). A Study on Impact of YouTube Advertisement Viewers Purchase Behavior and Attitudes. *IJRAR-International Journal of Research and Analytical Reviews (IJRAR)*, *10*(3), 612-622. DOI: https://doi.org/10.4038/jbt.v5i0.54
15. Sui, W., Sui, A., & Rhodes, R. E. (2022). What to watch: Practical considerations and strategies for using YouTube for research. *Digital Health*, *8*, 1-13. DOI: https://doi.org/10.1177/2055207622123707
16. Ansari, J. A. N., & Khan, N. A. (2020). Exploring the role of social media in collaborative learning the new domain of learning. *Smart Learning Environments*, *7*(1), 9. DOI: https://doi.org/10.1186/s40561-020-00118-7
17. Wahyuni, A., Utami, A. R., & Education, E. (2021). The use of YouTube video in encouraging speaking skill. *Pustakailmu. id*, *7*(3), 1-9. Retrieved from http://pustakailmu.id/index.php/pustakailmu/article/view/62 on 10-02-2024.

18. Rahmatika, R., Yusuf, M., & Agung, L. (2021). The effectiveness of YouTube as an online learning media. *Journal of Education Technology*, *5*(1), 152-158. DOI: https://doi.org/10.23887/jet.v5i1.33628
19. Farag, M., Bolton, D., & Lawrentschuk, N. (2020). Use of YouTube as a resource for surgical education—clarity or confusion. *European urology focus*, *6*(3), 445-449. DOI: https://doi.org/10.1016/j.euf.2019.09.017
20. Kohler, S., & Dietrich, T. C. (2021). Potentials and limitations of educational videos on YouTube for science communication. *Frontiers in communication*, *6*, 581302. DOI: https://doi.org/10.31235/osf.io/w4d9c
21. Arthurs, J., Drakopoulou, S., & Gandini, A. (2018). Researching YouTube. *Convergence the International Journal of Research into new Media Technologies*, *24*(1), 3-15. DOI: https://doi.org/10.1177/1354856517737222
22. Lu, J. (2023). Trending Videos on YouTube. *Journal of Education, Humanities and Social Sciences*, *7*, 84-91. DOI: https://doi.org/10.54097/ehss.v7i.4016
23. Liu, C. (2020). YouTube for Undergraduates-FINAL EdTech. Retrieved from https://www.scribd.com/document/671660306/YouTube-for-Undergraduates-FINAL-EdTech on 15-02-2024
24. Maziriri, E. T., Gapa, P., & Chuchu, T. (2020). Student Perceptions Towards the use of YouTube as An Educational Tool for Learning and Tutorials. International Journal of Instruction, 13(2), 119-138. DOI: https://doi.org/10.29333/iji.2020.1329a
25. Shoufan, A., & Mohamed, F. (2022). YouTube and education: A scoping review. *IEEE Access*, *10*, 125576-125599. DOI: https://doi.org/10.1109/ACCESS.2020.3225419
26. Roddt, S., and Peier, D. (2013). Using YouTube in the Classroom for the Next Generation of Students: *Issues in Informing Science and Information Technology, 10, 473–488.* DOI: https://doi.org/10.28945/1823