

SHS Students' Perception Towards YouTube as an Alternative Instruction in Physical Science

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Abstract

This study aimed to determine the relationship between the students' perception of using YouTube and their perceived learning outcomes in the field of Physical Science. It investigates the potential of YouTube as an instructional material and source of information in learning Physical Science. This research utilized a correlational research design and involved 50 grade 12 students from Dagatan National High School as respondents, who were selected using a simple random sampling technique. A Likert Scale questionnaire survey was utilized to collect data for this study. Mean, standard deviation, and Pearson product-moment correlation were the statistical methods employed in the analysis of the data. The analysis of the data indicated a significant relationship between the students' perception of using YouTube and their perceived learning outcomes in the field of Physical Science. The results revealed that YouTube has emerged as a valuable tool for enhancing educational instruction and providing effective learning resources for teaching science in high schools.

Keywords: youtube, alternative instruction, physical science

1. Introduction

Many statements proved that Physical Science is the one of the difficult subjects in secondary school level. Some of the difficulties in Physical science that students face when studying it are the unfamiliar words, meaning, context, theories and having a logical problem solving (G.Yashoda, 2020). According to Semeon and Mutekwe (2021), students encountered the difficulties in Physical Science particularly with the meaning of the non-technical words use in context. The difficulty of Physical Science was confusion in the unfamiliar context and lack of convincing explanations of meaning of the words in teaching and learning. The personal factors of difficulties stated that all the respondents in BSU, Philippines found difficulties in learning socio-cultural language that related in learning Physical Science (Natividad-Franco, 2022).

Physical Science can be challenging subject to study in academic due its complex and abstract concepts. Many students struggled to understand the principles of physical science and apply them to real-world situation. On the other hand, YouTube can be used as a tool for learning physical science, as there are many educational videos on the platform that discuss various concepts in this field.

YouTube is one of the most popular video sharing platforms in the world. According to Cihangir and Coklar (2021), YouTube in education and lifelong learning has been seen in some studies that YouTube as a learning tool has benefits and has potential benefits with its popularity. The statement's shows that YouTube can be use in the educational process and it is beneficial for the teachers to enhance the skills of the students. YouTube

videos enhance students' engagement, depth of understanding and overall satisfaction in higher education courses. According to Buzzetto-More (2014), the use of YouTube in the teaching and learning process enhanced instruction with the students most likely to visit video sharing services from mobile devices.

YouTube has become a global platform for learning and teaching. It designs as a social medium. Its rapidly growing content and obscurity of its search and recommendation system, however, frequently leave users with suboptimal result (Tadbier & Shofan, 2021). Kabooha & Zylas (2018) said that YouTube provide statistically significant effect on the student vocabulary acquisition, these findings of the study indicate that the participants positively viewed the use of YouTube in their lessons and revealed significant improvement in the student's vocabulary achievements.

2. Literature Review

2.1 YouTube

Social media has deeply penetrated space of our lives (Dr. Sharma & Sharma, 2021). Our every little necessity is now just a click away which has made our lives comparatively much easier and convenient. Social media like YouTube has proved to be an effective educational tool as it connects academicians, educators, and researchers from all over the world and provide interesting, knowledgeable, and engaging content which has added a new dimension to education by making it innovative as well as creative.

YouTube as an educational tool has been, recently receiving a great deal of attention from researchers and teachers (Maziriri, Gapa, & Chuvhu, April 2020). The studying question therefore investigates this phenomenon to this end, a modified conceptual model based on the technology acceptance model (TAM) was proposed to test student perceptions, attitudes, and intentions to adopt YouTube as an educational tool.

Srinivasacharlu (2020) stated that educators are increasingly understanding and adopting new methods of teaching laced with digitalization. YouTube is an important off shoot of digitalization, is leading the charge as the most multipurpose medium for content transactions in the classroom and outside the classroom not only provides digital entertainment but also provides a great environment for learning.

YouTube videos enhance student engagement, depth of understanding, and overall satisfaction in higher education courses while text-based resources have remained the standard for centuries, they do not appeal to the hyper-stimulated visual learners of today (A, 2014). Hasan (2021) mentioned that education and lifelong learning been seen in some studies that YouTube as a video learning tool has benefits and potential benefits with its popularity and easy to access.

Fleck et al. (2014) stated that people have a positive perception of using YouTube for education. It stimulates differentiated approach for learning new material. YouTube has a novelistic way to convey classroom learning context through real life situation and examples. With the advancement of technology and time, YouTube has come up as a unique teaching pedagogy which to promote scientific concepts. YouTube is a perfect educational tool to bring diversity of content in classroom.

2.2 Physical Science

The goal of the new Thirteenth edition is to stimulate students' interest in and gain knowledge of the physical sciences (Shipman, Willson, & Higgins, 2012). Presenting content in such a way that students develop the critical reasoning and problem-solving skills that are needed in an ever-changing technological world, the authors emphasize fundamental concepts as they progress through the five divisions of physical sciences: physics, chemistry, astronomy, meteorology, and geology. Ideal for a non-science majors' course, topics are treated both descriptively and quantitatively, providing instructors the flexibility to emphasize an approach that works best for their students. Shu-Chuan et al. (2017) explores the impact of problem-solving instruction on 126 middle school students learning a physical science in terms of their scientific knowledge scientific, concept dependent reasoning and problem-solving ability. Resulting that the problem-solving significantly outperform the traditional hands-on learning for both immediate and retaining effect regardless of scientific knowledge,

scientific concept of dependent reasoning and scientific problem-solving abilities.

Two main instructional practices are found in Physical Science education: one is prevalent, while the other is emerging (Maestre, 2017). They have all experienced the prevalent practice, which arises from the so-called transmission model of instruction. In this model, students are exposed to content through lectures, presentations, and readings, and are expected to absorb the transmitted knowledge in ready to use form. Although it is not a model of learning per se, the transmission model does make a pivotal assumption about learning, namely that the message the student receives is the message the teacher intended. In this study the authors set out to better understand the relationship between teacher knowledge of science and student learning (Sadler & Gerhand, 2016). The authors administered identical multiple-choice assessment items both to teachers at middle school physical science and to their students throughout the school year. The authors found that teachers who have strong content knowledge and can identify students' most common misconceptions in science are more likely to increase their students' science knowledge than teachers who do not.

3. Methodology

This study used correlational research design because it aimed to determine the relationship between the students' perception of using YouTube and their perceived learning outcomes in the field of Physical Science. According to Elizabeth et al. (2016), a correlation is a statistical test to determine the tendency or pattern for two (or more) variables or two sets of data to vary consistently.

This study determined if YouTube can be an alternative instruction in learning Physical Science. The group of respondents are determined using sampling technique. The sampling technique used is the simple random sampling. The respondents are consisted of 50 Grade 12 students in total at Dagatan National High School only. Sarjinder (2013) defined simple random sampling as the simplest and most common method of selecting a sample, in which the sample is selected unit by unit, with equal probability of selection for each unit at each draw. In other words, simple random sampling is a method of selecting a sample s of n units from a population Ω of size N by giving equal probability of selection to all units. It is a sampling scheme in which all possible Simple Random Sampling (SRS) is the simplest and most common method of combinations of n units may be formed from the population of N units with the same chance of selection.

After determining the respondents of the study, the researchers prepared a Likert scale for them to answer. According to Pritha and Kassian (2020), a Likert scale is a rating scale used to measure opinions, attitudes, or behaviors. It consists of a statement or a question, followed by a series of five or seven answer statements. Respondents choose the option that best corresponds with how they feel about the statement or question. Furthermore, according to (McLeod, 2019) Likert scale (typically) provides five possible answers to a statement or question that allows respondents to indicate their positive-to-negative strength of agreement or strength of feeling regarding the question or statement.

To answer if there is a significant relationship between the students' perception of using YouTube and their perceived learning outcomes in the field of Physical Science, the Pearson Product moment of Correlation was used. Turney (2022) defined Pearson correlation coefficient (r) as the most common way of measuring a linear correlation.

4. Results and Discussion

This chapter contains the tables which display the results of the study, explanation, and examination of the collected data. The progression and exploration of the study were directed by the problem statement outlined in Chapter 1, aiming to reach conclusions and make recommendations.

Table 1. Perception of the students in using YouTube in terms of Instructional Material.

Indicators	Mean	SD	Interpretation
As a student, I use YouTube because...			
1. it is a helpful alternative instruction.	3.48	.65	Strongly Agree
2. it is helps me to process my memory recall efficiency.	2.98	.74	Agree
3. I can grasp the content easier.	3.22	.55	Agree
4. the subject matter is easy to follow.	3.18	.77	Agree
5. I find it engaging.	3.30	.67	Strongly Agree
Overall	3.23	.68	Agree

Legend: 3.50-4.00- Strongly Agree (Very High); 2.50-3.49- Agree (High); 1.50-2.49- Disagree (Moderate); 1.00-1.49- Strongly Disagree (Low)

Table 1 shows the perception of the students in using YouTube in terms of instructional materials. Indicator 1 which states that “As a students, I use YouTube because it is a helpful alternative instruction” obtained the highest mean of 3.48 and a standard deviation of 0.65 with an interpretation of “strongly agree” while indicator 4 which states that “As a student, I use YouTube because it is helps me to process my memory recall efficiency” obtained the lowest mean of 2.98 and standard deviation of 0.74 with an interpretation of “agree”.

Taken as a whole, the perception of the student in using YouTube in terms of Instructional Material has a mean of 3.23 and standard deviation of 0.68 interpreted as “agree”. Since the overall interpretation on the perception of the students is “agree”, it can be implied that YouTube as an instructional material has a big involvement to the senior high school students.

YouTube educational materials could be adopted as an instructional material in the classroom situation and provide a well-informed and straightforward answers about classroom teaching process (Abubakar and Muhammed, n.d.).

Table 2. Perception of the students in using YouTube in terms of Source of Information.

Indicators	Mean	SD	Interpretation
When using YouTube,			
1. I gather some useful information in physical science.	3.08	.60	Agree
2. I apply what I’ve seen when studying physical science.	2.98	.65	Agree
3. I obtain additional knowledge about physical science for free access.	3.16	.68	Agree
4. I learn complex concepts by watching educational videos.	3.30	.71	Strongly Agree
5. I gain important experience and information.	3.36	.69	Strongly Agree
Overall	3.18	0.67	Agree

Legend: 3.50-4.00- Strongly Agree (Very High); 2.50-3.49- Agree (High); 1.50-2.49- Disagree (Moderate); 1.00-1.49- Strongly Disagree (Low)

Table 2 shows the perception of the students in using YouTube in terms of source of information. Indicator 5 which states that “When using YouTube, I gain important experience and information” obtained the highest mean of 3.36 and a standard deviation of 0.69 with an interpretation of “strongly agree” while indicator 2 which states that “When using YouTube, I apply what I’ve seen when studying physical science” obtained the lowest mean of 2.98 and standard deviation of 0.65 with an interpretation of “agree”.

Taken as a whole, the perception of the students in using YouTube in terms of Source of Information has a mean of 3.18 and standard deviation of 0.67 interpreted as “agree”. This data implied that YouTube can be a valuable source of information and has made significant contributions to the senior high students for their studies.

According to Aboundahr (2020), YouTube has become one of the main sources of learning in the student’s life at the present time which provides scalability of knowledge and ease of searching for sources of knowledge. It also provides the student with a large area of self-learning and provision of knowledge according to the desire of the student.

Table 3: Student perceptions in Learning Physical Science in terms of Fundamental Theories when YouTube is use as an Alternative Instruction.

Indicators	Mean	SD	Interpretation
YouTube...			
1. helps me to understand difficult concepts of physical science.	3.26	.60	Strongly Agree
2. helps me to comprehend and learn more about physical science.	3.12	.75	Agree
3. helps me to understand how our world functions on easier manner.	2.98	.71	Agree
4. guides me to know the basic principles of physical science.	3.00	.76	Agree
5. assists me to identify the implications of the fundamental theories in physical science.	2.90	.76	Agree
Overall	3.05	.72	Agree

Legend: 3.50-4.00- Strongly Agree (Very High); 2.50-3.49- Agree (High); 1.50-2.49- Disagree (Moderate); 1.00-1.49- Strongly Disagree (Low)

Table 3 shows the students’ perception in learning Physical Science c. Indicator 1 which states that “It helps me to understand difficult concepts of Physical Science” obtained the highest mean of 3.26 and standard deviation of 0.60 with an interpretation of “strongly agree” while indicator 5 which state that “It assist me to identify the implications of the fundamental theories in Physical Science” obtained the lowest mean of 2.90 and standard deviation of 0.76 with an interpretation of “agree”.

Taken as a whole, the students’ perception in learning Physical Science in terms of fundamental theories when YouTube is used as an alternative instruction has a mean of 3.05 and standard deviation of 0.72 interpreted as “agree”. These data implied that YouTube could become a valuable resource for accessing information on a wide range of topics including fundamental theories.

According to Baranov and Pivovarov (2018), YouTube is an effective instrument of transmitting lecture information, it contained theoretical fundamentals which created the necessary background for lectures in the classroom, where some of the studies are based on theories from video lectures were discussed.

Table 4: Student perceptions in Learning Physical Science in terms of Scientific Method when YouTube is use as an Alternative Instruction.

Indicators	Mean	SD	Interpretation
YouTube...			
1. helps me understand the process of an experiment.	3.32	.59	Strongly Agree
2. explains the purpose of things on a rational level.	3.14	.64	Agree
3. helps me apply the scientific method to solve problems.	3.00	.73	Agree
4. helps me identify the variables in a scientific experiment.	3.02	.68	Agree
5. makes me comfortable in using the scientific method to analyse data.	3.06	.71	Agree
Overall	3.10	.67	Agree

Legend: 3.50-4.00- Strongly Agree (Very High); 2.50-3.49- Agree (High); 1.50-2.49- Disagree (Moderate); 1.00-1.49- Strongly Disagree (Low)

Table 4 shows the students perceptions in learning Physical Science in terms of Scientific Method when YouTube is used as an alternative instruction. Indicator 1 which states that “I am able to understand the process of a experiments” obtained the highest mean of 3.32 and standard deviation of 0.59 with an interpretation of “strongly agree” while indicator 3 which state that “ I am able to apply the scientific method to solve problems” obtained the lowest mean of 3.00 and standard deviation of 0.72 with an interpretation of “agree”.

Taken as a whole, the students’ perception in learning Physical Science in terms of Scientific Method when YouTube is used as an alternative instruction has a mean of 3.10 and standard deviation of 0.68 interpreted as “agree”. It implied that YouTube in terms of scientific method can use as a tool to communicate a scientific methods and concepts, it utilized some information about scientific contents.

According to Beautemps and Breges (2021), educational videos on digital platforms like YouTube are an attractive way of learning, especially for the student’s generation, as they provide easy, personalize access to a wide variety of content and give an educational video that are highly suitable for scientific content.

Table 5. Correlation between the students' perception of using YouTube and their perceived learning outcomes in the field of Physical Science in terms of Fundamental Theories.

	r-value	p-value	Interpretation
Source of Information	.578	.000	Significant
Instructional Material	.548	.000	Significant

Legend: p-value<0.05 Significant; p-value>0.05 Not Significant

Table 5 shows the result of test correlation between the students' perception of using YouTube and their perceived learning outcomes in the field of Physical Science in terms of Fundamental Theories. It can be seen from table 5 that all variables have p-values of .000. It indicates that variables from YouTube as an alternative instruction are significantly related to learning Physical Science as to fundamental theories.

YouTube can be considered as an effective tool to enhance educational instruction if the videos are scrutinized, diversified, and aimed toward course objectives (Jaffar, 2012). YouTube supports classroom teaching with videos that emphasize applied aspects of anatomy and educational videos. It gives the student effectiveness videos within a problem-based learning curriculum.

Table 6. Correlation between the students' perception of using YouTube and their perceived learning outcomes in the field of Physical Science in terms of Scientific Method.

	r-value	p-value	Interpretation
Source of Information	.565	.000	Significant
Instructional Material	.493	.000	Significant

Legend: $p\text{-value} < 0.05$ Significant; $p\text{-value} > 0.05$ Not Significant

Table 6 shows the result of test correlation between the students' perception of using YouTube and their perceived learning outcomes in the field of Physical Science in terms of scientific method. It can be seen from table 5 that all variables have p-values of .000. It indicates that variables from YouTube as an alternative instruction are significantly related to learning Physical Science of the respondents as to scientific method.

To support the claim, Otchie et al. (2020) proposed the use of YouTube videos as effective learning resources for the teaching of science in high schools. This approach could potentially help to bridge the gap between theory and practice and likewise help the students in understanding the concept of Physical Science in terms of scientific methods.

5. Conclusion

The main purpose of this research is to determine the relationship between the students' perception of using YouTube and their perceived learning outcomes in the field of Physical Science. This research highlights the potential of YouTube as an alternative instruction in addressing the difficulties of the students face in learning Physical science subject.

Likewise, results from this study revealed that there is a significant relationship between the students' perception of using YouTube as an alternative instruction and their perceived learning outcomes in Physical Science with the p-value of .000. This implies that YouTube can be an effective alternative instruction in learning Physical Science in terms of fundamental theories and scientific methods.

The outcome of this study recommends future researchers explore the long-term impact of using YouTube as an alternative instruction tool in Physical Science. This can involve studying the academic performance, motivation, and engagement of students over an extended period. Additionally, investigating the effectiveness of different types of YouTube content (animations, demonstrations, explanations) and the role of active student participation can provide valuable insights for instructional practices.

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