

Knowledge, Attitude, and Practice on YouTube as a Supplementary Learning Tool in Mathematics: A Descriptive-Correlational Study Among Grade 10 Students

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Abstract

Students' awareness and attitudes toward YouTube influence its use in mathematics learning. This study examined the relationship between students' knowledge, attitude, and practice in using YouTube as a supplementary learning tool among Grade 10 students. A total of 186 students from Dulag National High School, selected through stratified random sampling, participated in the data collection. Using descriptive analysis, the findings revealed that students have a very high level of knowledge ($M = 4.23$), a positive attitude ($M = 3.98$) and often practice ($M = 3.77$) using YouTube as a supplementary learning tool in mathematics. Using correlation analysis, the result showed a moderate, positive, and significant relationship between students' knowledge and practice ($r = 0.534$, $p < 0.001$), suggesting that a higher level of knowledge is positively associated with more frequent use of YouTube as a supplementary learning tool in mathematics. Furthermore, a moderately strong, positive, and significant relationship was found between students' attitude and practice ($r = 0.677$, $p < 0.001$), indicating that students with a more positive attitude are more likely to use YouTube often as a supplementary learning tool in mathematics. The findings suggest that educators and school should provide activities or programs that enhance students' knowledge of YouTube and fosters a positive attitude towards its educational use.

Keywords: Knowledge; attitude; practice; YouTube; supplementary learning tool; mathematics

1. Introduction

YouTube, regarded as the leading video-sharing platform (Armetrics, 2026), has accumulated more than 2.70 billion monthly active users as of February 2026 globally (Global Media Insight, 2026). Among the top 10 biggest YouTube user bases, the Philippines sits in the 9th position having about 59.6 million users, representing 50.96% of the country's total population as of late 2025 (Global Media Insight, 2026). Since its launch in 2005, it has been widely used as a platform for watching and sharing videos online for a variety of purposes (i.e., entertainment and education).

In education, YouTube videos are considered an avenue for learning. Video creators do not only create a video that include discussions, tutorials, and explanations in a simplified manner, but also to seek comments from the audience (Dagohoy, 2023). This may be a reason why people, especially learners, spend their time watching YouTube videos (Chukwuere, 2022). Because YouTube is a powerful and accessible educational tool, its use as supplementary learning tool among students helps them complete tasks, review for upcoming assessments (i.e., exams, quizzes), visualize complex topics, and develop skills. In mathematics education, the vast array of YouTube videos, such as problem-solving demonstrations and various tutorial videos, serves as a learning pathway, a new way of supplementing classroom instruction (Hafiz & Azmi, 2023). Thereby, optimizing its potential may lead to improved students' overall performance.

Numerous studies in international contexts and varying fields have explored how positive perceptions of the platform have contributed to learning. These include mastery of vocabulary among Indonesian students (Mokodompit et al., (2020); completion of course assignments and study tasks ((Sakkir et al., 2020); and the fostering of learning skills and motivation (Gracella & Rahman Nur, 2020). Moreover, the effectiveness across disciplines is evident in various empirical studies, including improving algebraic understanding, particularly complex concepts; learning anatomy; entrepreneurship education; English language and vocabulary proficiency; technological literacy; performing arts; learning optics in physics; and computer skills (Aliyu et al., 2025; Jaffar, 2012; Eamchareon, 2024; Tawaqal & Rizqyan, 2023; Almurashi, 2016; DeWitt et al., 2020; Mulya et al., 2021; Ndiokubwayo & Uwamahoro, 2021; Ebied et al., 2016). This effectiveness can be attributed to the platforms' accessibility, which results in independent learning and enhances engagement both in and out of classroom instruction.

While the platform can be a powerful educational tool, its utilization or practice is still dependent on how students understand and appreciate it. Studying the knowledge, attitude and practice regarding the use of YouTube as supplementary tool in mathematics among Grade 10 students is important, given that many students rely on it

as an additional learning resource. However, it remains unclear whether having high knowledge on the platform, such as its features (i.e., playback speed, comments, and timestamp), credibility of channels, and reliability of math videos, leads significantly to utilization. Further, it is also unclear whether positive attitudes, such as motivation, enjoyment and confidence, significantly lead to utilization.

In the Philippines, there are limited studies conducted related to this context and subject area. This may be a pioneering study that utilizes the KAP (Knowledge, Attitude and Practice) framework. With all these in mind, it is imperative that this study aims to address the significant gaps in existing literature by exploring the relationship between students' level of knowledge (level of awareness of YouTube) and attitude (level of agreement) and their practice (level of frequency) in the use of YouTube as a supplementary learning tool in mathematics. Moreover, it aims to collect contextualized data in the Philippine educational system to adequately provide evidence to recommend, suggest, and inform policies, classroom practices, and future research.

1.1 Research Hypotheses

The research sought to examine the relationship between knowledge and attitude and their influence on practice in the use of YouTube as a supplementary learning tool in mathematics. The hypotheses are proposed as follows:

- H_{a1}: There is a significant relationship between students' knowledge and practice in the use of YouTube as a supplementary learning tool in mathematics.
- H_{a2}: There is a significant relationship between students' attitude and practice in the use of YouTube as a supplementary learning tool in mathematics.
- H₀₁: There is no significant relationship between students' knowledge and practice in the use of YouTube as a supplementary learning tool in mathematics.
- H₀₁: There is no significant relationship between students' attitude and practice in the use of YouTube as a supplementary learning tool in mathematics.

2. Methodology

This section describes the research design, study locale and respondents, research instruments, data-gathering procedure, data analysis, and ethical considerations.

2.1 Research Design

The study employed a descriptive-correlational research design to explore the relationship between students' knowledge and attitude and their influence on practice in the use of YouTube as a supplementary learning tool. The descriptive component aimed to analyze the levels of knowledge, attitude, and practice while the correlational component aimed to determine whether the variables are related to another variable without manipulating them.

2.2 Study Locale and Respondents

The study was conducted in Dulag National High School in Dulag, Leyte. A total of 186 Grade 10 students constituted the sample, determined using Slovin's formula with a 5% margin of error. The respondents were selected through a stratified random sampling to ensure that the sample adequately represented the population.

The inclusion criteria were as follows: students who used YouTube for learning mathematics; were enrolled in School Year 2025-2026; owned a gadget or digital device used to access math YouTube videos; had internet access; had been using YouTube at least half a year; and were willing to participate voluntarily in the study. The rationale for selecting Grade 10 students over other grade levels was their higher technological exposure, greater academic maturity, and increased learning autonomy.

2.3 Research Instrument

The KAP survey questionnaire was the instrument utilized for data collection, adapted from the KAP CQ-39 (Robledo et al., 2024). The instrument underwent modifications to suit the study's objectives. The modified

version underwent expert validation to measure content validity, and through the Lawshe Content Validity Index (CVI) of 0.80, the instrument’s content was deemed valid and acceptable.

The survey questionnaire was divided into three parts: level of knowledge, level of attitude, and level of practice; each section used a five-point Likert scale. Following pilot testing, Cronbach’s Alpha was computed on the instrument, resulting in the following:

<i>Constructs</i>	<i>No. of Items</i>	<i>Cronbach’s Alpha (α)</i>
Level of Knowledge	10	0.87
Level of Attitude	10	0.85
Level of Practice	10	0.88
Overall Reliability		0.87

Based on Table 1, an overall reliability of $\alpha = 0.87$ from a pilot testing indicates that the instrument has high internal consistency and reliability.

2.4 Data Gathering Procedure

Collection of data was accomplished with strict compliance with ethical and legal considerations. These entail the provision of informed assent and consent, and compliance with RA 10173, or “The Data Privacy Act of 2012”. The process commenced with securing approval from University’s Research Ethics Committee. Successive approvals were obtained via a Letter of Request from Schools Division of Leyte to Dulag South, and finally to the Office of School Principal. Grade 10 teachers were informed through a written and electronic communication.

The KAP survey questionnaire was administered digitally via Google Form to guarantee that students could respond at the most convenient way and time. Since the sample was minors, informed consent from parents and informed assent from students were obtained. To safeguard respondents’ anonymity and confidentiality, no identifying information were collected, and all the data were kept in encrypted files, to which only the researcher had full access.

2.5 Data Analysis

Data collected were entered and analyzed using JAMOVI (Version 2.6) at a significance level of $p < 0.05$. Descriptive statistics, such as mean and weighted mean, were calculated to describe the levels of knowledge, attitude, and practice regarding YouTube as a supplementary learning tool in Mathematics. Shapiro-Wilk Test was conducted to assess the distribution of scores for each variable, and it resulted in $p < 0.01$, indicating that the scores were not normally distributed. Although, normality was not met, considering the large sample size ($n = 186$), the scores are assumed to be approximately normally distributed according to Central Limit Theorem. With this assumption, a parametric test, specifically Pearson’s Correlation Coefficient at a significant level of 0.05 was employed.

2.6 Ethical Considerations

Prior to the administration of the survey questionnaire, the researcher acquired an approval from the University Research Ethics Committee. The committee validated the informed assent and informed consent forms to ensure that they contained all necessary information regarding the respondents’ benefit, risk and discomfort, confidentiality, data security, voluntary participation, and necessary ethical considerations. Across the conduct of the study, compliance with ethical guidelines and legal procedures was strictly observed.

3. Results and Discussion

This section presents the results, interpretations, discussions, and the implications derived from the data collected through the survey.

3.1. Level of Knowledge

Table 2. Mean Scores of Students’ Knowledge on YouTube as a Supplementary Learning Tool in Mathematics

<i>Statement</i>	<i>Mean</i>	<i>SD</i>	<i>Interpretation</i>
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1. I know how to search for quality math tutorial videos on YouTube.	4.05	0.89	HK
2. I can identify credible YouTube channels for learning mathematics.	3.91	0.93	HK
3. I know how to identify and adjust playback speed and captions for better understanding.	4.30	0.86	VHK
4. I know how to use YouTube’s “save” or “playlist” features for math learning.	4.29	0.88	VHK
5. I can identify which YouTube math tutorial videos are reliable and accurate.	4.09	0.88	HK
6. I know how to evaluate if a video is helpful for my lessons.	4.28	0.84	VHK
7. I know how to access YouTube offline (download videos or save for later).	4.40	0.81	VHK
8. I am aware that YouTube videos can supplement classroom lessons.	4.30	0.81	VHK
9. I know that YouTube offers step-by-step math problem solutions.	4.34	0.83	VHK
10. I am aware of different YouTube features that can enhance math learning (comments, timestamps, etc.).	4.31	0.84	VHK

Legend: Very Highly Knowledgeable VHK (4.21-5.00); Highly Knowledgeable HK (3.41-4.20); Moderately Knowledgeable MK (2.61-3.40); Slightly Knowledgeable SK (1.81-2.60); Not Knowledgeable NK (1.00-1.80)

Table 2 presents the respondents’ level of knowledge on YouTube as supplementary learning tool in mathematics. Means scores ranged from 3.91 to 4.40, indicating a high to a very high levels of knowledge. Standard deviations ranged from 0.81 to 0.93, indicating that respondent’s answers were relatively consistent.

Respondents were very highly knowledgeable on the following indicators: accessing offline videos (Mean = 4.40); understanding the step-by-step solutions offered by the platform (Mean = 4.34); and being aware of different YouTube features that can enhance math learning (e.g., comments, timestamps) (Mean = 4.31). On the other hand, respondents were only highly knowledgeable on the following indicators: identifying reliable and accurate videos (Mean = 4.09); searching for quality math videos (Mean = 4.05); and identifying credible YouTube channels (Mean = 3.91).

3.2. Level of Attitude

Table 3. Mean Scores of Students’ Attitude on YouTube as a Supplementary Learning Tool in Mathematics

Category	Mean	SD	Interpretation
1. I enjoy learning math through YouTube videos.	4.01	0.89	PA
2. YouTube helps me understand math lessons better.	4.08	0.82	PA
3. I feel motivated to study math when I use YouTube.	3.85	0.92	PA
4. YouTube makes math less intimidating for me.	3.87	0.96	PA
5. I believe YouTube is an effective supplementary tool for math learning.	4.11	0.87	PA
6. Teachers should recommend YouTube channels for math topics.	3.95	0.99	PA
7. I feel confident solving math problems after watching tutorials.	4.02	0.91	PA
8. YouTube is not a distraction when studying math.	3.96	0.91	PA
9. I think YouTube should be integrated into classroom activities.	3.78	0.97	PA
10. I would suggest YouTube as a resource to my classmates for learning math.	4.13	0.88	PA

Legend: Very Positive Attitude VPA (4.21-5.00); Positive Attitude PA (3.41-4.20); Neutral Attitude NuA (2.61-3.40); Negative Attitude NeA (1.81-2.60); Very Negative Attitude VNA (1.00-1.80)

Table 3 presents the respondents’ level of attitude toward YouTube as a supplementary learning tool in mathematics. Means scores ranged from 3.78 to 4.13, all interpreted as “Positive Attitude”. Standard deviations ranged from 0.82 and 0.97, indicating that respondents’ answers were relatively consistent.

Respondents expressed their highest positive attitude on the following indicators: “I would suggest YouTube as a resource to my classmates” (Mean = 4.13); “I believe YouTube is an effective supplementary tool

for math learning” (Mean = 4.11); and “YouTube helps me understand math lessons better” (Mean = 4.02). Conversely, respondents expressed their lowest levels of positive attitude on the following indicators: “I think YouTube should be integrated into classroom activities” (Mean = 3.78); “I feel motivated to study math when I use YouTube.” (Mean = 3.85); and “YouTube makes math less intimidating for me.” (Mean = 3.87).

3.3 Level of Practice

Table 4. Mean Scores of Students’ Practice on YouTube as a Supplementary Learning Tool in Mathematics

<i>Category</i>	<i>Mean</i>	<i>SD</i>	<i>Interpretation</i>
1. I watch YouTube math videos after school for review.	3.63	0.97	OP
2. I use YouTube tutorials before quizzes or exams.	3.60	1.07	OP
3. I pause or replay videos to understand solutions better.	4.09	0.99	OP
4. I take notes while watching YouTube math tutorials.	3.72	1.08	OP
5. I subscribe to math-focused YouTube channels.	3.56	1.28	OP
6. I share math tutorial videos with classmates.	3.35	1.20	SP
7. I use playlists or “Watch Later” for organizing math videos.	3.73	1.15	OP
8. I practice solving problems after watching a YouTube tutorial.	4.00	1.09	OP
9. I watch YouTube videos whenever I do not understand the teacher’s explanation.	4.01	1.00	OP
10. I look for alternative solutions on YouTube if I find a problem difficult.	4.06	0.97	OP

Legend: Always Practiced AP (4.21-5.00); Often Practiced OP (3.41-4.20); Sometimes Practiced SP (2.61-3.40); Rarely Practiced RP (1.81-2.60); Never Practiced (1.00-1.80)

Table 4 presents the students’ level of practice on YouTube as supplementary learning tool in mathematics. Data show that 9 out of 10 indicators received an “Often Practiced” rating, while 1 indicator as “Sometimes Practiced”. Mean scores ranged from 3.35 and 4.09, indicating that students were sometimes or often practiced on using YouTube. Standard deviations ranged from 0.97 and 1.28, suggesting that while students often practiced, the frequency of these practices varied slight across indicators.

The indicators with the highest frequency of practice based on the mean scores were: “I pause or replay videos to understand solutions better” (Mean = 4.09); “I look for alternative solutions on YouTube if I find a problem difficult” (Mean = 4.06); and “I watch YouTube videos whenever I do not understand the teacher’s explanation” (Mean = 4.01). Conversely, the indicators with lowest level of frequency based on the mean scores were: “I share math tutorial videos with classmates.” (Mean = 3.35); “I subscribe to math-focused YouTube channels” (Mean = 3.56) and “I use YouTube tutorials before quizzes or exams” (Mean = 3.60).

Table 5. Mean Scores of Students’ Level of Knowledge, Attitude, and Practice

<i>Level</i>	<i>Mean</i>	<i>SD</i>	<i>Interpretation</i>
Knowledge	4.23	0.857	Very Highly Knowledgeable
Attitude	3.98	0.912	Positive Attitude
Practice	3.77	1.08	Often Practice

Table 5 summarizes the means score for each level. Respondents demonstrated a very high knowledge, positive attitude and often practice on YouTube as supplementary learning tool in Mathematics.

A very high level of knowledge indicates that the students are generally aware of the features and important contribution of YouTube to learning mathematics. This finding supports the study by Okri et al. (2025), who reported that 59% of the students of Ikom LGA were aware of YouTube software as a tool for learning mathematics. Moreover, a review of YouTube utilization in the Philippine classrooms has stated that YouTube is recognized as an enhancement tool in educational contexts, suggesting that the students are aware of the platform’s educational application.

A positive attitude indicates that students enjoy, are motivated by, and appreciate the assistance provided by YouTube in learning mathematics. This finding is further supported by Okri et al. (2025), who reported that

56% of the students of Ikom Local Government Area (LGA) demonstrated a positive attitude toward YouTube software as a tool for learning mathematics. Additionally, Faye (2015) reported that high perception and strong preferences contributed to the development of a positive attitude regarding the use of YouTube as a supplementary learning tool in mathematics.

An “often practiced” level indicates that students consistently use the platform in learning mathematics. This corroborates previous studies highlighting that YouTube is widely utilized given that it provides students with opportunities to clarify difficult topics, follow step-by-step tutorials, and supplement classroom instruction (Dreon et al., 2011; Alwehaibi, 2015). Moreover, this may be attributed to the fact that YouTube is free, mobile friendly, available anytime and can provide immediate support when students struggle to complete homework or other tasks without teacher assistance.

Table 6. Normality of Scores in Knowledge, Attitude, and Practice using Shapiro-Wilk Test

<i>Level</i>	<i>N</i>	<i>Mean</i>	<i>Shapiro-Wilk Test</i>		
			<i>SD</i>	<i>W</i>	<i>p</i>
Knowledge	186	4.23	0.664	0.919	< .001
Attitude	186	3.98	0.723	0.934	< .001
Practice	186	3.77	0.832	0.944	< .001

Table 6 presents the Shapiro-Wilk test for normality of scores in the levels of knowledge, attitude, and practice. Results show that Knowledge ($W = 0.919, p < .001$), Attitude ($W = 0.934, p < .001$), and Practice ($W = 0.944, p < .001$), all have p-values less than .001, indicating that distributions of the three levels are not normally distributed. However, considering the large sample size ($n = 186$), the scores are assumed to be approximately normally distributed according to Central Limit Theorem. With this assumption, parametric test, specifically Pearson’s Correlation Coefficient will be employed.

Table 7. Correlation Between Knowledge and Practice Using Pearson’s Correlation Coefficient (r)

<i>KNOWLEDGE OVERALL MEAN</i>	<i>PRACTICE OVERALL MEAN</i>	
	Pearson’s r	0.543
df	184	
p-value	<.001	

Table 6 presents the Pearson’s Correlation Coefficient between students’ level of knowledge and practice on YouTube as a supplementary learning tool in mathematics. Results indicate a moderate positive relationship ($r = 0.543, p\text{-value} < .001$), which is statistically significant at $\alpha = .05$. This finding suggests that students who demonstrate a high level of knowledge are more likely to frequently practice using YouTube as a supplementary learning tool in mathematics. Moreover, the strength of this correlation indicates that knowledge plays an important role in students’ behavior, particularly in the utilization of YouTube. This finding is consistent with the study by Greeves et al. (2024), which reported that students who recognize and value the educational benefits of YouTube are more engaged in using it for learning activities.

Table 7. Correlation Between Attitude and Practice Using Pearson’s Correlation Coefficient (r)

<i>ATTITUDE OVERALL MEAN</i>	<i>PRACTICE OVERALL MEAN</i>	
	Pearson’s r	0.677
df	184	
p-value	<.001	

Table 7 presents the Pearson’s Correlation Coefficient between students’ level of attitude and practice on YouTube as a supplementary learning tool in mathematics. Results indicate a moderate to strong positive relationship ($r = 0.677, p\text{-value} < .001$) and is statistically significant at $\alpha = .05$. This finding suggests that students with more positive attitude are more likely to frequently practice using YouTube as a supplementary learning tool in mathematics. Moreover, the strength of this correlation suggests that attitude plays a bigger role in predicting practice. This finding is consistent with the previous research, which reported that students’ positive attitude toward educational technology are significantly related their actual use, suggesting that favorable attitudes can predict student behavior (Celik et al., 2019).

Summary and Conclusions

Descriptive analysis revealed that students demonstrated a very high knowledge, a positive attitude, and often practice in the use of YouTube as a supplementary learning tool in mathematics. Demonstrating a very high level of knowledge suggests that students recognize the significant contributions and features of YouTube as an ancillary tool for learning mathematics. A positive attitude indicates that students perceive the platform not only as a source of entertainment but also as a meaningful educational resource. More fairly, the often practice of using YouTube implies that students consistently utilize the platform as supplementary learning tool.

Correlation analysis revealed a moderate positive relationship between students' knowledge and practice in using YouTube for learning. This suggests that students who have higher levels of knowledge are more likely to engage in the practical use of YouTube for learning mathematics. Furthermore, analysis revealed a moderate to strong positive relationship between students' attitude and practice. This suggests that students with more favourable attitude are more likely to engage in frequent use of YouTube as a supplementary learning tool in mathematics.

Based on these findings, it is recommended that the schools and educators provide initiatives, activities or programs that enhance students' knowledge of YouTube and fosters positive attitude toward its educational use. Such initiatives may include guided tutorials, classroom integration, or awareness campaign about credible and reliable resources available on YouTube.

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