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The impact of video integrated with Bloom's Taxonomy on the improvement of English-speaking performance

[1]Ranta Butarbutar*, [2]Seli Marlina Radja Leba, [3]Angla F Sauhenda

[1,2]*Department of English Education, Faculty of Teacher Training and Education, University of Musamus Merauke, Papua, Indonesia*

[3]*Department of Indonesian Language and Literature, Faculty of Teacher Training and Education, University of Musamus Merauke, Papua, Indonesia*

Speaking has an essential role in students' performance in the English language subject. This study aims to investigate 30 English language students who are given video in the experimental class. The results show that there is an improvement of participants' English-speaking performance which is indicated by the increase of scores between pre-test and post-test through four speaking components, such as fluency, precision, lexical, and syntactical. The most significant increase is found in the precision aspect with a pre-test value of 1.00 and a post-test value of 3.07. The results also reveal that both written and verbal communication can be improved by using the method of video integrated with Bloom's taxonomy. However, the limited participants of the study and the length of drilling speaking are confirmed as the limitation of the study. Besides, it implies video integrated taxonomy Bloom for reducing anxiety in learning speaking and classroom activities research (CAR) investigation are recommendations for future study.

Keywords: Video; Bloom's Taxonomy; Speaking; Performance

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*Correspondence:
Ranta Butarbutar
ranta@unmus.ac.id

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INTRODUCTION

Speaking has been classified as a productive skill in the English language (Saed, Haider, Al-Salman, & Hussein, 2021). Thus, it has an essential role during classroom activities which includes the performance of students. In line with the Indonesian national curriculum, speaking attracts attention primarily for being practiced at the secondary level (Bashori, van Hout, Strik, & Cucchiarini, 2021). Previous studies have already been made to improve students' English-speaking performances in classroom activities which can be done through the use of video (Chien, Hwang, & Jong, 2020; Zheng, Wang, & Chai, 2021).

The use of video increases students' interest in participating in discussions (Dahlstrom-Hakki, Alstad, & Banerjee, 2020), which makes it easier to retrieve student cognitive abilities that trigger the increase of speaking skills including awareness, attention, noticing, and understanding. Video could also maximize the achievement of learning objectives in a short time and stimulate students' interest in learning to be more independent (Wagener, 2006). A few great theories supporting integrating video into speaking performance are explained in (Briggs & Wager, 1981; Gagne, Briggs & Wager, 1979; Hannum & Briggs, 1982). Briggs' theory emphasizes characteristics based on the stimulus hence using video, it can elicit rather than the medium itself, i.e., the suitability of these stimuli for student characteristics, assignments, learning, materials, and rhythm.

On the other hand, Briggs identified the kinds of media used in the teaching and learning process, including object models, live sound, audio recordings, films, television, and pictures.

Referring to those perspectives, video can effectively stimulate students' behavior by encouraging them to be active and responsive when speaking. Furthermore, several investigations integrating video in speaking performance were conducted by (Butarbutar, R., Uspayanti, R., Bawawa, M., & Leba, S. M. R. (2020), Crompton, Burke, & Lin, 2019; Köksal & Ulum, 2018; Rosell-Aguilar, 2017) They evaluated mobile applications for learning languages in which the results show that mobile devices and their features which includes potential audio, visual, play-back, pause and voice recording facilitate students in learning language development.

Along with applying taxonomy, speaking performance features are also highlights of renowned level learning that is much publicized by Bloom's Taxonomy. It clusters students' learning into six levels, namely remembering, comprehending, implementing, analyzing, synthesizing, and evaluation.

Additionally, (Adams, 2015; Köksal & Ulum, 2018; Mohammadi, Kiany, Samar, & Akbari, 2015; Nur et.al, 2019; Stanny, 2016) agreed that Bloom's Taxonomy can help teachers highlight and evaluate students' language performance improvement. Although research has shown that video is useful for English as a foreign language (EFL) learners' speaking, further research is needed to determine the degree to which Bloom's taxonomy will help student speaking skills especially when it is integrated with the video. In a similar fashion, Butarbutar, R., et al. (2021a, 2021b) mentioned that using technology was essential to improve learners' performance in technology grow particular. They emphasized that using technology during speaking activities might as a main or alternative source.

To the best of our knowledge, only a few studies have looked into integrating video with Bloom's taxonomy to improve students' speaking performance. Therefore, this study aims to fill this research gap and to investigate the differences in English-speaking performance outputs between pre and post video integrated with Bloom's taxonomy. To make better understanding obviously, the study narrows down and covered the research questions, how does the impact of video integrated with taxonomy Bloom on speaking students' performance?

METHODS

Participants

The participants consisted of 30 secondary school students who took English lessons. There were twenty females and thirteen males. Their ages average between 15 and 18 years. For detailed information, all participants used Indonesian as their first language and for communicating at school. Referring to the speaking assessment, participants' speaking ability was categorized as poor.

Research Instruments

Underpinning research questions, pre-test, post-test, and watching videos were applied to gather data. At the first meeting, the participants were invited to personally describe pictures and topics chosen regarding four speaking performances (fluency, precision, syntactic complexity and lexical complexity. Participants were then given a topic-based video and continued to the post-test by comparing six levels of Bloom's taxonomy (remembering, comprehending, implementing, analyzing, synthesizing and evaluation). All questions of pre-test and post-test were validated used SPSS application R-Table as 0.3610 (N=30). Whereas the validity test used Cronbach Alpha (0.633).

Research Procedures

Performance in the speaking classroom was activated by referring to Bloom's taxonomy. The speaking test was used to evaluate speaking skills such as fluency, precision, syntactic complexity and lexical complexity. Description, contrast, and interpretation with and without preparation time were aspects and forms of speaking performance that are also studied. The watch, think and speak (WTS) strategy was used in this work. The complete research procedures are shown in Table 1.

TABLE 1 | Research Procedures

Week	Taxonomy categories	Speaking performance
1.	Pre-test session	Fluency, precision, syntactic complexity and lexical complexity
2.	Remembering/knowledge (Indicated by clicking the pause button on the video integrated with Bloom's taxonomy features)	Learning orientation Students watched video provided by teacher entitled Describing something, favorite places, and experiences
3.	Comprehending (Indicated when students have time to implement or to practice speaking to their classmates)	Students watched video about comparing two or more pictures
4.	Implementing	Teachers have exploring chosen pictures
5.	Analyzing (After watching the topic chosen during playback and voice recording, speaking performance)	Analyzing, comparing and showing related each topics
6.	Synthesizing	Planning, revising, justifying and integrating to the new comprehension or knowledge

7.	Evaluating (Supported by images, native speaker's pronunciation video and all features of technological video)	Evaluating, criticizing and revising based on the existing instruction.
8.	Post-test session	Fluency, precision, syntactic complexity and lexical complexity

Table 1 description: pre-test done in the week 1 whereas class performance employed during seven weeks and the last week took post-test. Importance to be remembered, those activities spent time for nine minutes per each week.

Data Analysis

The study used one pre-test and one post-test design experimental approach. In this case, a quantitative method was used and multivariate analysis of variate (MANOVA) with Games-Howell of a significant 0.05 level was applied to investigate the difference in students' performance on pre-test and post-test.

RESULTS AND DISCUSSION

The formed research question in this work is how do students who got videos integrated with Bloom's taxonomy differ from those who did not in their English-speaking performance? And the results of pre-test and post-test can clearly be seen in Table 2. This table shows the mean and standard deviation of students' speaking performances in relation to Bloom's taxonomy before being given the video, in which each category was lower than post-test scores. The pre-test mean score was 1.05 whereas the post-test mean score was 3.11. It shows a difference of 2.06 points, meaning the videos improved students' score at 2.06 for each Bloom's taxonomy level and speaking performance at the same time.

TABLE 2 | Results of pre-test and post-test based on Bloom's taxonomy

Descriptive Statistics				
	Taxonomy	Mean	Std. Deviation	N
Pre-test	Remembering	1.27	.450	30
	Comprehending	1.00	.263	30
	Implementing	1.03	.183	30
	Analyzing	1.00	.000	30
	Synthesizing	1.00	.000	30
	Evaluation	1.00	.000	30
	Total	1.05	243	180
Post-test	Remembering	3.17	.531	30
	Comprehending	3.07	.640	30
	Implementing	2.90	.403	30
	Analyzing	2.83	.379	30
	Synthesizing	3.03	.183	30
	Evaluation	3.63	.490	30
	Total	3.11	.523	180

Table 3 then informs that each speaking component was increased by integrating video with Bloom's taxonomy. The results show the increase of participant's score between pre-test and post-test of four speaking components. The most significant increase was precision aspect (pre-test = 1.00 SD=.263; post-test= 3.07 SD=.640).

TABLE 3 | Students' Speaking Performance Comparison

Speaking test	N	Pre-test Mean	Pre-test Std. Deviation	Post-test Mean	Post-test Std. Deviation
1. Fluency	30	1.27	.450	3.17	.531
2. Precision	30	1.00	.263	3.07	.640
3. Syntactic complexity	30	1.03	.183	2.90	.403
4. Lexical complexity	30	1.00	.000	2.83	.379
Valid N (list wise)	30				

The improvements of speaking performance when thematic videos were used based on Bloom's taxonomy are then shown in Table 4 (see appendix). It can be observed that there are improvements in each of the four speaking components.

Regarding research question as mentioned above, how does the impact of video integrated with taxonomy Bloom on speaking student's performance? The study confirmed that video integrated with taxonomy Bloom was useful and helpful improve students speaking performance significant statistically. All the scores evidence were clearly seen in Table 4, Table 5, Table 6, Table 7, Table 8, Table 9 (see appendices), students' speaking performance increased between pre-test and post-test. The most significant increase was the precision aspect. The results mean that there is an effective impact on improving speaking performances by integrating video with Bloom's taxonomy. Previous authors have examined the positive impact of video on speaking performance. For instance, according to (Crompton et al., 2019; Köksal & Ulum, 2018; Rosell-Aguilar, 2017), students become more active, enthusiastic, and comprehending through video. Importantly, participants of the study as foreign learners paid more attention to the native speaker's intonation in the video and then they watched the video several times. Thus, their Bloom's taxonomy level (remembering) developed simultaneously.

Based on a series of learning processes carried out by students in this study, they have progressed in speaking performance which was seen toward four elements, i.e., fluency, lexical, syntactical and precision. Some of these conditions were also found in previous work (Spring, Kato, & Mori, 2019). It was also found in this work that students felt it was easier to understand what speakers said through directly seen body language or gestures shown in the video.

The importance of non-verbal behaviors which affect speaking performance was also found in (Bickmore et al., 2021, Butarbutar, R. (2018).

The ease with which students express themselves, particularly when speaking, is referred to as fluency (De Jong et.al, 2013). Even if there are a few grammar mistakes in the explanation, it should be conveyed in a clear and understandable manner that exhibits their knowledge of the language. In line with this, giving large opportunities for students to describe and compare different pictures in video 1 and video 2 (See Table 6, Table 7 and Table 8) were best practices to attract Bloom's taxonomy level of synthesizing and evaluation.

The results of the study were in line and highlighting (Butarbutar, R., 2021; Crompton, Burke, & Lin, 2019; Köksal & Ulum, 2018; Rosell-Aguilar, 2017) perceptions. They clarified using audio recording was effective and useful for drilling accuracy and fluency. For doing so, students might press stop button or delete button whether recorded voice out of standard measurement. Similarly, (Briggs & Wager, 1981; Gagne, Briggs & Wager, 1979; Hannum & Briggs, 1982) asserted that visual and audio recording are assigned the abilities based on the hierarchical levels of learning, such as, ejection learning stimulus, attracting interest in learning examples of learning behavior, providing external conditions, guiding ways to think, entering knowledge transfer, assessing achievement and providing feedback on speaking performance. In terms of this, video integrated with Bloom's taxonomy implies the development of linguistics and intercultural communication competence simultaneously (synthesizing and evaluation taxonomy level).

Besides, the study noted that video facilitates participants to improve meaning and lexical complexity of previous input media. Thus, the more they are given plenty of chances, the more they produce or speak up by retelling of a video's topic as in alignment with the results in (Richards, 2008).

Accordingly, empowerment of cognitive Bloom's taxonomy internalization and technology pedagogical knowledge contents are the efforts that must be made by teachers to improve speaking performance outcomes. There are various strategies and learning models that can improve technology pedagogical knowledge content as found in (Bragg, Walsh, & Heyeres, 2021; Firestone, Aramburo, & Cruz, 2021; Li, Valcke, Dessein, Badan, & Anderl, 2021). For empirical study clearly, the study also supported (Crompton, Burke, & Lin, 2019; Köksal & Ulum, 2018; Rosell-Aguilar, 2017) which investigated mobile application was insightful used for speaking improvement. For example, student recorded his voice by pressing recording and play-back, and pause button, simultaneously analyzing and evaluating process were occurred. The highest level of taxonomy Bloom is evaluation, and in terms of this, participants of the study might be evaluated their speaking performance after given drills in six weeks meeting and fluency element in particular. All features of video recording as pause, play-back, record, stop button were helpful to empower analyzing, comprehending, synthesizing, and evaluating process.

Furthermore, teachers must also implement an assessment process that supports digital literacy and technology Butarbutar, R., & Simatupang, E. (2020). Pedagogical knowledge content into speaking performance competencies. One must also have a good understanding of how cognitive Bloom's taxonomy internalization and technological pedagogical knowledge contents are applied to speaking performance during classroom activities. In light of speaking performance, teachers are also expected to intertwine interactive video with a factual-based learning approach (Butarbutar, R., 2022, Butarbutar et al., 2019, Leba, S. M. R., Butarbutar, R., & Werang, B. R. (2021), Nakatsuhara, Inoue, Berry, & Galaczi, 2017).

CONCLUSION

This study emphasizes a pedagogical implication for teacher education that video integrated with Bloom's taxonomy has a significant impact on secondary school speaking performance. The results show that video can help them correctly pronounce and use grammar by observing the way the video is pronounced and by watching written text in the video script. We also found that students who got video integrated with Bloom's taxonomy out performed those who did not get the video in terms of English-speaking performance. Their discrepancy is drawn into several levels. Firstly, remember was indicated by clicking the pause button on the video integrated with Bloom's taxonomy features. Secondly, implementing and comprehending were indicated when students had time to implement or to practice speaking to their classmates (by clicking the pause & stop button). Thirdly, after watching the chosen topic during playback and voice recording, speaking performance improved in terms of analyzing and synthesizing. Lastly, the evaluation showed the highest level of speaking performance supported by images, the provided native speaker's pronunciation video, and all features of the video. Due to the potential of video integrated with Bloom's taxonomy, it is recommended for teachers to use video to increase the accuracy and fluency in speaking performance. A similar future study is recommended through a classroom action research (CAR) investigation.

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Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

APPENDICES

TABLE 4 | Speaking performance improvement based on Bloom's taxonomy

No	Speaking components	Thematic video	Bloom's taxonomy level
1	Fluency	Ease to express video topic chosen; not repeating words used twice but once conveyed in a clear and understandable manner; can explain topic in video 1 & 2 and free from too long pauses.	Remembering, comprehending, analyzing
2	Precision	The way video of discussed topic delivered accurately; comparing picture 1 and the rest pictures effectively.	Knowledge, comprehending, synthesizing, analyzing
3	Syntactic complexity	Speaking or explaining topic in video 1 & 2 in good orders; referring grammar correctly	Evaluating, comprehending
4	Lexical complexity	Speaking or performing video topics meaningfully	Comprehending, analyzing, evaluation

TABLE 5 | Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.986	6094.017b	2.000	173.000	.000
	Wilks' Lambda	.014	6094.017b	2.000	173.000	.000
	Hotelling's Trace	70.451	6094.017b	2.000	173.000	.000
	Roy's Largest Root	70.451	6094.017b	2.000	173.000	.000
taxonomy	Pillai's Trace	.411	8.998	10.000	348.000	.000
	Wilks' Lambda	.629	9.014b	10.000	346.000	.000
	Hotelling's Trace	.525	9.030	10.000	344.000	.000
	Roy's Largest Root	.333	11.590c	5.000	174.000	.000

a. Intercept + taxonomy is the design.

b. A precise statistic

c. The statistic is a lower bound on the significance level that is an upper bound on F.

Table 5 illustrates that video was effective as a medium to improve speaking performance with a significance of lower than 0.05.

TABLE 6 | The Equality of Error Test of Levene Variances[a]

	F	df.1	df2	Sig.
pretest	7.656	5	174	.000
posttest	30.409	5	174	.000

The null hypothesis states that the error variance of the dependent variable is the same across groups.
a. Intercept + taxonomy is the design.

TABLE 7 | Between-subjects effects tests

Source	Dependent Variable	Type III Sum of Squares		Mean Square	F	Sig.
Corrected Model	pretest	12.161[a]	5	2.432	11.490	.000
	posttest	1.717[b]	5	.343	6.763	.000
Intercept	pretest	1736.006	1	1736.006	8200.859	.000
	posttest	198.450	1	198.450	3909.091	.000
Taxonomy	pretest	12.161	5	2.432	11.490	.000
	posttest	1.717	5	.343	6.763	.000
Error	pretest	36.833	174	.212		
	posttest	8.833	174	.051		
Total	pretest	1785.000	180			

	posttest	209.000	180
Corrected Total	pretest	48.994	179
	posttest	10.550	179

R Squared =.248 (R Squared Adjusted =.227)

R Squared =.163 (R Squared Adjusted =.139)

Another empirical study supports the impact of videos on speaking performance by developing the Bloom's taxonomy as can be seen in Table 5. Bloom's taxonomy ratings for six subjects (remembering, comprehending, implementing, analyzing, synthesizing, and evaluating) were less than significant .05. On the other hand, those six subjects were significant to improving speaking performance.

TABLE 8 | Post Hoc test taxonomy

Dependent Variable	(I) taxonomy	(J) taxonomy	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
		Implementing	.13	.119	1.000	-.22	.49
		Analyzing	.20	.119	1.000	-.15	.55
		Evaluation	-.60*	.119	.000	-.95	-.25
		Remembering	.47*	.119	.002	.11	.82
		comprehending	.57*	.119	.000	.21	.92
	evaluation	Implementing	.73*	.119	.000	.38	1.09
		Analyzing	.80*	.119	.000	.45	1.15
		Synthesizing	.60*	.119	.000	.25	.95
Pre-test		comprehending	.10	.152	.986	-.35	.55
Games-		implementing	.27	.122	.258	-.09	.63
Howell	remembering	analyzing	.33	.119	.073	-.02	.69
		synthesizing	.13	.102	.782	-.18	.44
		evaluation	-.47*	.132	.010	-.86	-.08
		remembering	-.10	.152	.986	-.55	.35
		implementing	.17	.138	.831	-.24	.58
	comprehending	analyzing	.23	.136	.527	-.17	.64
		synthesizing	.03	.121	1.000	-.33	.40
		evaluation	-.57*	.147	.004	-1.00	-.13
		remembering	-.27	.122	.258	-.63	.09
		comprehending	-.17	.138	.831	-.58	.24
	implementing	analyzing	.07	.101	.986	-.23	.36
		synthesizing	-.13	.081	.570	-.37	.11
		evaluation	.00	.058	1.000	-.17	.17
		remembering	-.23*	.058	.001	-.41	-.06
		comprehending	.03	.058	1.000	-.14	.21
	implementing	analyzing	.03	.058	1.000	-.14	.21
		synthesizing	.03	.058	1.000	-.14	.21
		evaluation	.03	.058	1.000	-.14	.21
		remembering	-.27*	.058	.000	-.44	-.09
		comprehending	.00	.058	1.000	-.17	.17
	analyzing	implementing	-.03	.058	1.000	-.21	.14
		synthesizing	.00	.058	1.000	-.17	.17
		evaluation	.00	.058	1.000	-.17	.17
		remembering	-.27*	.058	.000	-.44	-.09
		comprehending	.00	.058	1.000	-.17	.17
	synthesizing	implementing	-.03	.058	1.000	-.21	.14
		analyzing	.00	.058	1.000	-.17	.17
		evaluation	.00	.058	1.000	-.17	.17
		remembering	-.27*	.058	.000	-.44	-.09
		comprehending	.00	.058	1.000	-.17	.17
	evaluation	implementing	-.03	.058	1.000	-.21	.14
		analyzing	.00	.058	1.000	-.17	.17
		synthesizing	.00	.058	1.000	-.17	.17

Post-test Games-Howell	remembering	comprehending	.27	.095	.074	-.02	.55
		implementing	.23	.089	.114	-.03	.50
		analyzing	.27*	.082	.032	.02	.52
		synthesizing	.27*	.082	.032	.02	.52
		evaluation	.27*	.082	.032	.02	.52
	comprehending	remembering	-.27	.095	.074	-.55	.02
		implementing	-.03	.058	.993	-.21	.14
		analyzing	.00	.048	1.000	-.15	.15
		synthesizing	.00	.048	1.000	-.15	.15
		evaluation	.00	.048	1.000	-.15	.15
	implementing	remembering	-.23	.089	.114	-.50	.03
		comprehending	.03	.058	.993	-.14	.21
		analyzing	.03	.033	.914	-.07	.13
		synthesizing	.03	.033	.914	-.07	.13
		evaluation	.03	.033	.914	-.07	.13
	analyzing	remembering	-.27*	.082	.032	-.52	-.02
		comprehending	.00	.048	1.000	-.15	.15
		implementing	-.03	.033	.914	-.13	.07
		synthesizing	.00	.000	.	.00	.00
		evaluation	.00	.000	.	.00	.00
	synthesizing	remembering	-.27*	.082	.032	-.52	-.02
		comprehending	.00	.048	1.000	-.15	.15
		implementing	-.03	.033	.914	-.13	.07
		analyzing	.00	.000	.	.00	.00
		evaluation	.00	.000	.	.00	.00
	evaluation	remembering	-.27*	.082	.032	-.52	-.02
		comprehending	.00	.048	1.000	-.15	.15
		implementing	-.03	.033	.914	-.13	.07
		analyzing	.00	.000	.	.00	.00
		synthesizing	.00	.000	.	.00	.00

On the basis of observed means.
Mean Square (Error) =.052. * is the error term.
At the.05 level, the mean difference is significant.

TABLE 9 | Estimated Margins Means Taxonomy

Dependent Variable	taxonomy	Mean	Std. Error	95% Confidence Interval Lower Bound	Dependent Variable Upper Bound
Post-test	remembering	3.167	.084	3.001	3.332
	comprehending	3.067	.084	2.901	3.232
	implementing	2.900	.084	2.734	3.066
	analyzing	2.833	.084	2.668	2.999
	synthesizing	3.033	.084	2.868	3.199
	evaluation	3.633	.084	3.468	3.799
Pre-test	remembering	1.267	.041	1.185	1.348
	comprehending	1.000	.041	.919	1.081
	implementing	1.033	.041	.952	1.115
	analyzing	1.000	.041	.919	1.081
	synthesizing	1.000	.041	.919	1.081
	evaluation	1.000	.041	.919	1.081