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Integration of Downloaded Video in Learning Agriculture and Test Scores Among Students

Joselyn G. Abcede[1*] and Alexander N. Morados[1,2]
[1]*Camiguin Polytechnic State College*
[*]*joselyn.galvadores@deped.gov.ph*, [2]*alexandermorados8@gmail.com*

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ABSTRACT

This study examined the integration of downloaded instructional videos in learning Agriculture and the test scores of Grade 9 students at Mahinog National High School II during School Year 2025-2026. A quasi-experimental pretest-posttest design was used with two intact heterogeneous classes: 36 learners in the control group and 36 learners in the experimental group. The control group received lecture-based instruction without digital aids, while the experimental group received multimedia presentations and downloaded video demonstrations on second-quarter Agriculture lessons. A 30-item teacher-made multiple-choice test was administered before and after the three-week intervention. Frequency, percentage, mean, standard deviation, independent-samples t-test, and regression analysis were used. The experimental group obtained higher mean scores than the control group in both the pretest ($M = 7.61$, $SD = 1.49$ versus $M = 7.34$, $SD = 1.94$) and posttest ($M = 8.44$, $SD = 1.04$ versus $M = 8.20$, $SD = 1.59$). However, the direct comparison between groups was not statistically significant, $t(70) = 0.74$, $p = .46$. The reported regression model was significant, $F(3, 68) = 32.66$, $p < .001$, and explained 59% of the variance in posttest scores ($R^2 = .59$). The reported interaction term was significant ($p = .03$), suggesting that the relationship between pretest and posttest performance varied across instructional conditions. The findings indicate that downloaded videos may support learning consistency and modest score gains, but the intervention did not produce a statistically significant direct advantage over lecture-based instruction. Further studies with clearer regression specifications, larger samples, and longer interventions are recommended.

Keywords: *Agriculture education, downloaded videos, Grade 9 students, multimedia instruction, quasi-experimental design, test scores*

INTRODUCTION

Agriculture contributes to livelihood, employment, food security, and sustainable economic development. Its importance is reflected in the Sustainable Development Goals, particularly SDG 2 on zero hunger, SDG 4 on quality education, and SDG 8 on decent work and economic growth (United Nations, 2015). Strengthening agriculture education is therefore important for developing learners' understanding of agricultural processes and their readiness to engage with sustainable practices.

Teaching Agriculture can be challenging when instruction relies heavily on verbal explanation or textbook-based presentation. Agricultural concepts and procedures often involve observable processes, tools, demonstrations, and real-world applications. Multimedia resources, including instructional videos, may help students visualize complex procedures and connect classroom content with practical situations. Video-based learning can also support repeated viewing and offline access when internet connectivity is inconsistent.

Research on educational videos suggests that multimedia resources can enhance engagement, understanding, and retention when videos are aligned with learning objectives and integrated purposefully into instruction (Berk, 2009; Hsin & Cigas, 2013; Kay, 2012; Zhang et al., 2006). In agriculture education, video-

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supported learning may be useful because it can demonstrate practical processes that are difficult to explain through lecture alone (Jumintono et al., 2021).

This study examined whether the integration of downloaded instructional videos was associated with improved test scores among Grade 9 students in Agriculture. It also described the learners' profile and examined a reported moderation effect involving pretest and posttest performance across instructional conditions.

Literature Review

Video-Based Learning and Student Achievement

Instructional videos can provide visual and auditory explanations that support comprehension and retention. Berk (2009) discussed the instructional value of video clips in classroom teaching, while Kay (2012) synthesized literature on video podcasts in education. Hsin and Cigas (2013) found that short videos can improve student learning in online education. Zhang et al. (2006) likewise examined the impact of interactive video on learning effectiveness. These studies indicate that video resources are most useful when they are aligned with instruction rather than presented as isolated materials.

Educational Technology in Agriculture Education

Agriculture education benefits from demonstrations because many concepts involve procedures, tools, and observable stages of production. Nwike and Onyejegbu (2013) reported that instructional materials can support cognitive achievement in agricultural science. Jumintono et al. (2021) examined video-based learning in a post-harvest handling subject and highlighted the value of visual materials in making technical concepts easier to understand. More broadly, Xu et al. (2023) reviewed the impact of educational technology in agriculture education and emphasized the importance of studying how digital tools are used in specific instructional contexts.

Downloaded Videos as an Offline Learning Resource

Downloaded instructional videos are particularly relevant in settings where stable internet connectivity cannot be assumed. Once downloaded, videos can be viewed offline, replayed during lessons, and integrated into classroom discussions without requiring continuous access to an online platform. Their value depends on the quality of the content, the clarity of the explanation, and the teacher's ability to connect the video with learning objectives, guided activities, and assessment.

Prior Knowledge and Learning Outcomes

Pretest performance is commonly used as an indicator of prior knowledge. When pretest and posttest scores are examined together, researchers can determine whether instructional conditions influence the relationship between baseline understanding and subsequent achievement. In the present study, the regression analysis was used to examine the reported moderation effect across instructional conditions.

METHODS

Research Design

The study employed a quasi-experimental pretest-posttest design using intact classroom groups. This design was appropriate because the participants were drawn from existing heterogeneous Grade 9 sections rather than randomly assigned. The control group received lecture-based instruction without digital aids, while the experimental group received instruction supported by downloaded video demonstrations and multimedia presentations.

Research Locale

The study was conducted at Mahinog National High School II in Barangay Poblacion, Mahinog, Camiguin. The school serves junior and senior high school learners under the K to 12 Basic Education Curriculum.

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Participants and Sampling Technique

The participants were 72 Grade 9 students enrolled during School Year 2025-2026. Two intact heterogeneous sections were included: Grade 9-Aristotle and Grade 9-Joules. Each section consisted of 36 learners. One section served as the control group, while the other served as the experimental group.

Research Instrument

A teacher-made 30-item multiple-choice test was used to assess the learners' knowledge of three consecutive second-quarter Agriculture lessons. Each lesson was represented by 10 items. The same assessment format and content were administered during the pretest and posttest. The source manuscript states that the instruments underwent validation and pilot testing before implementation.

Instructional Intervention

The intervention was implemented for three weeks. The experimental group received Agriculture instruction using multimedia presentations and downloaded video demonstrations. The control group received conventional lecture-based instruction without digital aids. Both groups were taught the selected Agriculture lessons and were assessed before and after the instructional period.

Data Gathering Procedure

The researcher obtained authorization from the school head and division office. Informed consent was secured from the students and their parents or guardians. Both groups completed the pretest before instruction and the posttest after the three-week intervention. The test papers were objectively scored, encoded, and analyzed.

Data Analysis

Frequency and percentage were used to describe the participants' profile. Mean and standard deviation were used to summarize pretest and posttest scores. An independent-samples t-test was used to compare the control and experimental groups. Regression analysis was used to examine the reported relationship between pretest and posttest performance and the reported interaction effect across instructional conditions.

Ethical Consideration

The study observed informed consent, voluntary participation, confidentiality, anonymity, and secure data handling. Participants were informed of the purpose and procedures of the study and their right to withdraw without academic penalty. The intervention was conducted with fairness and respect for the participants' welfare.

RESULTS AND DISCUSSION

Profile of the Respondents

Table 1. *Profile of the Respondents (N = 72)*

Variable	Category	Frequency	Percentage
Sex	Male	34	47.22%
	Female	38	52.78%
Family monthly income	Less than ₱13,727	59	81.94%
	₱13,727-₱27,454	7	9.72%
	₱27,454-₱54,909	5	6.94%
	₱54,909-₱109,818	1	1.39%
	₱109,818-₱219,636	0	0.00%
	Above ₱219,636	0	0.00%
Household size	3-4 persons	21	29.17%
	5-6 persons	30	41.67%
	7-8 persons	16	22.22%
	9 or more persons	5	6.94%

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Slightly more than half of the respondents were female (52.78%). Most learners came from households with a monthly income below ₱13,727 (81.94%), and the largest household-size category was five to six persons (41.67%). These characteristics provide context for the use of downloadable offline resources, which may be practical when access to stable internet connectivity is limited.

Pretest and Posttest Scores With and Without Downloaded Videos

Table 2. *Test Scores During the Pretest and Posttest*

Assessment	Instructional Condition	n	Mean	SD
Pretest	Control: without downloaded videos	36	7.34	1.94
	Experimental: with downloaded videos	36	7.61	1.49
Posttest	Control: without downloaded videos	36	8.20	1.59
	Experimental: with downloaded videos	36	8.44	1.04

Both groups obtained higher posttest means than pretest means. The control group's mean increased from 7.34 to 8.20, while the experimental group's mean increased from 7.61 to 8.44. The experimental group had slightly higher mean scores and a smaller posttest standard deviation (SD = 1.04) than the control group (SD = 1.59). The smaller dispersion suggests that the posttest scores in the video group were more consistent. However, descriptive differences alone do not establish a statistically significant treatment effect.

Independent-Samples t-Test

Table 3. *Independent-Samples t-Test Comparing Test Scores With and Without Downloaded Videos*

Comparison	t-calculated	t-critical	df	p-value	Decision	Interpretation
Control versus experimental groups	0.74	1.99	70	.46	Fail to reject H0	Not significant

The independent-samples t-test yielded $t(70) = 0.74$, $p = .46$. Because the p-value was greater than .05, the null hypothesis was not rejected. The direct difference between the control and experimental groups was not statistically significant. Therefore, the observed mean advantage for the downloaded-video group should be interpreted cautiously.

Regression Analysis and Reported Moderation Effect

Table 4. *Regression Analysis Summary*

Model	F	df	Model p-value	R^2	Interaction p-value
Pretest, instructional condition, and interaction term predicting posttest score	32.66	3, 68	< .001	.59	.03

The reported regression model was statistically significant, $F(3, 68) = 32.66$, $p < .001$, and accounted for 59% of the variance in posttest scores ($R^2 = .59$). The reported interaction term was also significant ($p = .03$). As presented in the source manuscript, this suggests that the relationship between pretest and posttest performance differed across instructional conditions. In practical terms, prior knowledge was strongly related to posttest performance, and the use of downloaded videos may have changed the strength of that relationship.

The regression finding should be interpreted alongside the nonsignificant direct comparison. The video-supported lessons may have influenced learning patterns without producing a statistically significant overall score difference between groups. Additional studies with larger samples and a clearly documented regression specification are needed to confirm the moderation effect.

Interpretation of the Findings

The results are consistent with the view that videos can supplement classroom instruction by showing processes visually and allowing repeated explanation. The experimental group demonstrated slightly higher posttest performance and lower score variability. Similar literature emphasizes that instructional videos can strengthen learning when they are purposefully integrated into teaching and connected with assessment and guided activities (Berk, 2009; Hsin & Cigas, 2013; Kay, 2012; Zhang et al., 2006).

At the same time, the nonsignificant t-test indicates that downloaded videos should not be treated as an automatic substitute for sound teaching. Their value depends on lesson design, the quality and relevance of the content, the duration of the intervention, and the teacher's facilitation of discussion and practice.

CONCLUSION

The integration of downloaded instructional videos in Grade 9 Agriculture lessons was associated with slightly higher posttest scores and more consistent performance in the experimental group. However, the direct difference between learners taught with downloaded videos and those taught through lecture-based instruction was not statistically significant at the .05 level. The regression model reported in the source manuscript explained 59% of the variance in posttest scores and included a significant interaction term, suggesting that instructional condition may have influenced the relationship between prior knowledge and posttest performance. Overall, downloaded videos show promise as a supplementary offline instructional resource, but the available evidence does not establish a definitive treatment advantage.

Recommendation

1. Teachers may use downloaded instructional videos as supplementary resources in Agriculture lessons, especially when visual demonstrations can clarify procedures and concepts.
2. Downloaded videos may be paired with guided questions, short reflection tasks, demonstrations, and follow-up activities so that viewing remains aligned with learning objectives.
3. Schools may curate and quality-check offline video resources for use in settings with limited or unstable internet access.
4. Future studies may use larger samples, longer intervention periods, and multiple Agriculture topics to determine whether the observed mean differences become statistically significant.
5. Researchers may report the complete regression specification, coding of the instructional-condition variable, coefficient estimates, standard errors, and confidence intervals to support interpretation of the moderation effect.
6. The original data file may be rechecked before journal submission because the source manuscript contains minor inconsistencies in the reported profile thresholds, section-distribution table, and statistical labels.

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