IMPROVING LEARNERS' COMPETENCY IN PLANTING SEEDS THROUGH STEP-BY-STEP DEMONSTRATION VIDEOS IN AGRICULTURE LESSONS

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Abstract

This study investigated the effectiveness of step-by-step demonstration videos in improving Grade 4 learners' competency in planting seeds during Agriculture lessons under Edukasyong Pantahanan at Pangkabuhayan (EPP). A quasi-experimental one-group pretest–posttest design was implemented at Balayang Elementary School, Victoria, Tarlac, involving Grade 4 learners who completed performance-based assessments before and after exposure to the video intervention. Learners' competency was measured using a teacher-made rubric that evaluated key seed-planting indicators, including seed selection, soil preparation, planting depth and covering, spacing, watering, safety practices, and adherence to the correct sequence of procedures.

Pretest results showed that learners were moderately competent overall (M = 2.23), with the weakest performance observed in spacing and correct planting depth. After the step-by-step demonstration videos were integrated into instruction and followed by guided practice, learners' competency improved to a competent level (M = 3.16). A paired-samples t-test confirmed that the performance improvement was statistically significant ($t = 11.96$, $p = 0.001$), indicating that the video-based approach had a meaningful positive effect on learners' seed-planting skills. Qualitative findings further revealed that learners encountered challenges such as the fast-paced nature of videos, unfamiliar technical terms, poor audio-visual quality, limited device access, distractions during viewing, and the need for teacher clarification during application.

Overall, the study suggests that step-by-step demonstration videos can strengthen procedural agricultural competencies among young learners, particularly when supported by teacher guidance and opportunities for hands-on practice.

Keywords: Seed Planting, Demonstration Videos, Learner Competency, Agriculture Education, Procedural Skills, Grade 4, EPP, Video-Based Instruction

1. Introduction

Agriculture education at the elementary level plays an important role in helping learners build practical life skills and develop an early appreciation for food production and environmental responsibility. In many basic education programs, Agriculture is not taught only as a body of knowledge but as a competency-based subject that requires students to perform procedures correctly, safely, and consistently. For example, in the Philippine basic education curriculum under Edukasyong Pantahanan at Pangkabuhayan (EPP) and Technology and Livelihood Education (TLE), learners are expected to demonstrate foundational competencies such as proper tool use, safety practices, and practical agricultural tasks, including planting and propagating crops (Department of Education [DepEd], 2019). Because these competencies are performance-based, instructional methods must ensure that learners can observe correct procedures, practice repeatedly, and receive feedback that strengthens accuracy and confidence.

Among the basic agricultural skills introduced in the elementary years, planting seeds is considered one of the most essential. Seed planting requires learners to follow a sequence of steps—selecting appropriate seeds, preparing the soil or planting medium, ensuring correct depth and spacing, watering properly, and maintaining cleanliness and safety. These steps may appear

simple, but they demand careful attention to detail. When learners plant seeds incorrectly—for example, by placing them too deep or too shallow, or by overcrowding—germination rates and plant health are affected. In classroom contexts, these errors can discourage learners, reduce motivation, and create a cycle in which students avoid hands-on agricultural activities because they perceive them as difficult or prone to failure.

However, teaching procedural skills to young learners can be challenging, mainly when instruction depends heavily on one-time teacher demonstrations. In a typical classroom, the teacher demonstrates the process once and then asks learners to practice. While this approach is common, it has limitations. Learners may not have equal visibility during demonstrations; some may miss key steps, and others may quickly forget procedures once practice begins. These problems become more pronounced when classroom time is limited and when teachers must monitor several learners simultaneously. As a result, even when teachers provide clear instructions, learners may still perform tasks inconsistently due to uneven exposure and limited opportunities to revisit the procedure.

Instructional video demonstrations have increasingly been recognized as a promising approach to address these challenges. Demonstration videos offer learners a consistent model of correct performance and, more importantly, allow repeated viewing. This feature aligns with how procedural skills are developed—through observation, repetition, and gradual refinement. The value of modeling for learning is supported by Social Learning Theory, which emphasizes that individuals learn behaviors and skills through observing others, retaining the observed information, reproducing the behavior, and being motivated to perform it (Bandura, 1977). In the context of elementary Agriculture, learners can observe correct seed-planting behaviors through video, store the procedural sequence in memory, and then apply it during practice.

Beyond modeling, video demonstrations also align strongly with the principles of multimedia learning. According to the Cognitive Theory of Multimedia Learning, learners understand concepts more deeply when instruction is presented through both verbal and visual channels rather than through words alone (Mayer, 2009). In agricultural skills training, videos can demonstrate actions (e.g., how deep to plant seeds) while also explaining the rationale for each step (e.g., preventing seed rot or supporting germination). This dual-channel presentation can reduce confusion and help learners build clearer mental models of what successful performance looks like.

A key advantage of step-by-step demonstration videos is that they support self-paced learning. Learners can pause, replay, and review difficult steps—features that are rarely available in live demonstrations. This is particularly helpful for young learners who may need more time to process information or who learn at different speeds. Video modeling resources in educational practice also recommend creating distraction-free viewing contexts, ensuring that learners have access to materials while watching, and integrating videos at moments when the skill is naturally practiced (Vanderbilt Kennedy Center, n.d.). When structured properly, videos can be embedded into classroom routines so learners can watch and immediately apply what they see, strengthening retention and skill accuracy.

Even with these benefits, it is important to recognize that video demonstrations are not automatically effective unless they match learners' needs and learning contexts. Some learners may struggle with pacing, technical vocabulary, or unclear audio-visual quality. Others may have limited access to devices or may become distracted during viewing. Evidence-based resources on video modeling emphasize that successful implementation depends on careful planning—such as ensuring accessibility, checking comprehension, and providing guided practice afterward (Ohio Center for Autism and Low Incidence [OCALI], n.d.). Although some evidence-based practice materials on video modeling focus heavily on learners with special needs, the underlying instructional value of clear modeling and repeated exposure is equally relevant for general education contexts. In a competency-based subject like Agriculture, where procedural accuracy

matters, a structured, video-based approach may provide the scaffolding that helps learners progress from partial understanding to mastery.

In the Philippine elementary setting, the need for improved teaching strategies in practical Agriculture is also shaped by real classroom conditions. Teachers often face limited resources, large class sizes, and time constraints. Practical activities such as planting may be difficult to conduct repeatedly due to a lack of planting materials or school garden space. In such contexts, videos offer a cost-efficient support tool. Teachers can use the same video repeatedly across classes, share it with learners for home viewing when possible, and use it as a standardized reference for expected performance. Furthermore, DepEd learning resources and modules for EPP Agriculture already acknowledge the importance of practical application and step-by-step competency development, reinforcing the alignment of video demonstrations with curriculum goals (DepEd, 2019).

Given these considerations, investigating the effectiveness of step-by-step demonstration videos in improving seed-planting competency among Grade 4 learners is both timely and relevant. While educational technology is often associated with higher grade levels, elementary learners also benefit significantly when instructional materials match their developmental needs—especially when the task is procedural. When learners can clearly see what to do, understand why it matters, and practice with confidence, they are more likely to achieve competency and develop positive attitudes toward agricultural learning.

This study, therefore, focuses on using step-by-step demonstration videos as an instructional intervention to strengthen Grade 4 learners' competency in planting seeds in Agriculture lessons. Specifically, it examines learners' competency levels before and after the intervention, determines whether the changes are statistically significant, and explores the challenges learners encounter when using video instruction. Understanding both the benefits and the limitations of video demonstrations can help teachers refine instructional design, improve learner outcomes, and support the overall goal of competency-based learning in elementary Agriculture education.

2. Method

2.1 Research Design

The study employed a quasi-experimental research design, specifically a one-group pretest–posttest approach, to determine the effectiveness of step-by-step demonstration videos in improving Grade 4 learners' competency in planting seeds. This design was selected because it allows the researcher to measure changes in learners' performance over time using the same group of participants, making it appropriate for classroom-based interventions where random assignment and control groups may not be feasible. In this study, learners' seed-planting competency was first assessed through a pretest performance evaluation to establish baseline skill levels. After the pretest, the instructional intervention was implemented through step-by-step demonstration videos that guided learners through the correct procedures for planting seeds. Following exposure to the intervention and guided practice, a posttest performance assessment was administered using the same rubric to determine whether learners demonstrated measurable improvement. The resulting pretest and posttest scores were then compared using appropriate statistical analysis, such as a paired-samples t-test, to establish whether the observed differences were significant and attributable to the instructional strategy.

2.2 Participants

The participants of the study were Grade 4 learners enrolled in Agriculture lessons under Edukasyong Pantahanan at Pangkabuhayan (EPP) at Balayang Elementary School, located in Barangay Balayang, Victoria, Tarlac. The selection of participants followed a purposive

sampling approach through total enumeration, wherein all learners in the identified Grade 4 class section were included to ensure complete representation of the target group. These learners were chosen because seed planting is a required competency in the Grade 4 Agriculture curriculum and because classroom observations indicated the need to strengthen procedural skills in planting. As the primary beneficiaries of the intervention, the participants underwent both pretest and posttest performance assessments. They participated in step-by-step demonstration video sessions, enabling the study to examine measurable changes in their seed-planting competency within an authentic classroom context.

2.3 Instrumentation

The study used a set of research instruments to measure learners' competency in planting seeds and to capture the contextual challenges encountered during the intervention. The primary instrument was a teacher-made performance assessment rubric aligned with the Grade 4 Agriculture learning competencies under EPP, which served as the basis for evaluating learners' procedural performance during both the pretest and posttest. The rubric covered key indicators of seed-planting competency, including selecting appropriate seeds, preparing materials, following the correct planting depth and spacing, applying proper watering techniques, maintaining cleanliness and safety, and observing the correct sequence of steps. To supplement quantitative findings and enrich the interpretation of results, the study also employed learner feedback/reflection prompts and teacher observation notes to document learners' experiences as they used the step-by-step demonstration videos. These qualitative tools were used to identify recurring issues in comprehension, pacing, accessibility, and the application of video-demonstrated procedures during hands-on practice, thereby providing a more comprehensive understanding of the intervention's effectiveness and limitations.

2.4 Data Analysis

Data analysis in the study involved both descriptive and inferential procedures to determine the effectiveness of step-by-step demonstration videos in improving learners' seed-planting competency. Quantitative data from the pretest and posttest performance assessments were first summarized using descriptive statistics, including mean scores and standard deviations for each competency indicator and overall performance. These values were interpreted using the study's competency rating scale to describe learners' baseline and post-intervention skill levels. To determine whether the observed improvements were statistically significant, the study used a paired-samples t-test, which compared the mean pretest and posttest scores within the same group of participants and assessed whether the difference could be attributed to the intervention. Qualitative data gathered through learner feedback and teacher observation notes were analyzed using thematic grouping, wherein recurring statements and patterns were clustered into common themes reflecting the challenges learners encountered while using the video-based instruction. The integration of these quantitative and qualitative analyses provided both statistical evidence of learning gains and contextual insight into factors affecting implementation and learner performance.

3. Results

The study found that step-by-step demonstration videos led to a marked improvement in Grade 4 learners' seed-planting competency. Prior to the intervention, learners demonstrated an overall moderately competent performance level, with a pretest mean score of M = 2.23, and the weakest skills observed in precision-based indicators such as seed spacing (M = 1.92) and planting depth and covering (M = 2.05). Following exposure to the video-based instruction and guided practice, learners' performance increased to an overall competent level, reflected by a posttest mean score of M = 3.16, with gains evident across all rubric indicators,

including those previously identified as challenging. The improvement between the pretest and posttest scores was statistically significant, as confirmed by the paired-samples t-test ($t = 11.96$, $p = 0.001$), indicating that the intervention had a meaningful effect on learners' competency. In addition to these quantitative gains, qualitative findings revealed that learners encountered implementation-related challenges, including difficulty following the video's pacing, unfamiliarity with technical terms, unclear audiovisual quality, limited device access, distractions during viewing, and the continued need for teacher clarification during hands-on application. Overall, the results suggest that step-by-step demonstration videos are effective instructional supports for strengthening procedural agricultural skills, particularly when complemented by teacher guidance and immediate practice opportunities.

4. Discussion

The findings of this study demonstrate that step-by-step demonstration videos are effective instructional supports for improving Grade 4 learners' competency in planting seeds. The statistically significant increase in posttest performance suggests that learners benefited from repeated exposure to a clear and consistent procedural model. This improvement is consistent with theoretical perspectives that emphasize learning through observation and imitation. Social Learning Theory posits that learners acquire new behaviors by attending to a model, retaining observed sequences, reproducing them through practice, and sustaining performance through motivation and reinforcement (Bandura, 1977). In the context of seed planting, the videos served as a stable model of expected performance, enabling learners to revisit specific steps such as seed spacing, planting depth, and sequencing—components that are often missed during one-time classroom demonstrations. This modeling advantage is significant in elementary competency-based instruction, where mastery depends on accurate procedural execution rather than recall alone. Moreover, the use of demonstration videos aligns with the EPP/TLE curriculum's emphasis on developing practical life skills through application-oriented learning experiences, making the intervention relevant to the competency-based goals of Philippine basic education (Department of Education [DepEd], 2023).

The improvement in learners' performance may also be explained through multimedia learning principles, which highlight how combining verbal explanations with visual representations supports deeper understanding and skill acquisition. The Cognitive Theory of Multimedia Learning argues that learners process information through dual channels—visual and verbal—and build stronger mental representations when they can integrate spoken or printed explanations with images and demonstrations (Mayer, 2009). Seed planting requires learners to understand not only what to do but also how to do it precisely, such as gauging correct depth, spacing seeds evenly, and applying appropriate covering techniques. Demonstration videos provide a form of guided procedural visualization that reduces ambiguity, particularly for learners who struggle with abstract instructions. In addition, the videos allow learners to control the pacing of learning by pausing and replaying difficult portions, reinforcing retention and increasing confidence during hands-on practice. Practical guidance on video modeling emphasizes that this approach is most effective when learners can clearly see and hear the modeled behavior and when the modeled skill is embedded in routines that allow learners to apply what they observe immediately (Vanderbilt Kennedy Center, n.d.).

Although the quantitative results confirm the intervention's effectiveness, the qualitative findings highlight important implementation constraints that may influence learning outcomes in real classroom settings. Learners reported difficulty keeping up with the video's pacing, challenges understanding technical terms, and issues with audio-visual clarity, all of which can limit comprehension and reduce the effectiveness of video-based instruction. These challenges align with evidence-based recommendations for video modeling, which stress that videos should be deliberately designed with learner needs in mind—using clear visuals, manageable segments,

minimal distractions, and accessibility supports such as structured guidance and opportunities for clarification (OCALI, n.d.). This reinforces the idea that demonstration videos function best as scaffolding tools rather than replacements for teacher instruction. In practical Agriculture lessons, teacher facilitation remains essential for ensuring learners understand key vocabulary, correcting misconceptions in real time, and providing feedback as learners translate observed procedures into actual performance. Furthermore, access barriers such as limited devices and distractions during viewing indicate that video integration must be planned with contextual realities in mind, particularly in settings where learning resources may be unevenly distributed. Overall, the study supports integrating demonstration videos into a blended, practice-driven approach to competency development, provided that teachers address design quality, pacing, and guided application to maximize learning gains.

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