

Effectiveness of Multimedia Arts Skillset (MArS) on the performance task of Grade 10 learners

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Abstract

The goal of education is to provide learners the opportunity to acquire knowledge and skills that will enable them to develop their full potential and become successful members of society. This action research sought to enhance the performance task outcomes of Grade 10 learners through the Multimedia Arts Skillset (MArS). The study employed a quasi-experimental two-group design, utilizing purposive sampling to determine the participants. The experimental group consisted of Grade 10 Aguinardo learners, while the control group comprised Grade 10 Osmeña learners from Doña Francisca Lacsamana de Ortega Memorial National High School during school year 2024-2025. Both groups specialized in cookery under the Technology and Livelihood Education (TLE) subject. The intervention, MArS, was a collection of multimedia arts-based activities targeting selected third-quarter competencies. It functioned similarly to video lessons, providing learners with a comprehensive overview of the tasks. These multimedia-based tasks included instructional videos, digital demonstrations, and interactive presentations that helped students grasp essential concepts. The intervention spanned one quarter, allowing learners ample time to engage with the material and apply their knowledge to performance tasks effectively. Data were analyzed using the mean and t-test. Results indicated a significant improvement in learners' performance task levels following the intervention, demonstrating its effectiveness in enhancing understanding and skill acquisition. Therefore, MArS is recommended for implementation and utilization in the curriculum to support student learning and competency development in TLE cookery.

Keywords: multimedia arts, performance task, cookery, skillset, video lesson, competency

Effectiveness of Multimedia Arts Skillset (MArS) on the performance task of Grade 10 learners

1. Introduction

The United Nations Sustainable Development Goal (SDG) 4 underscores the global imperative of “quality education for all.” Its Target 4.1 further specifies that, by 2030, every child—irrespective of gender or background—must complete free, equitable and high-quality primary and secondary schooling that equips them with relevant skills and knowledge for life in a rapidly changing world (United Nations Organization, 2024). This international framework serves as the philosophical foundation for national education reforms worldwide, including the Philippines’ recent transition to a competency-based K-12 curriculum. The present literature review examines how these macro-level objectives translate into micro-level instructional practices, with particular attention to Technology and Livelihood Education (TLE) in the Grade 10 cookery specialization, the challenges faced by teachers, and the emergent role of multimedia technologies—especially instructional video lessons—in enhancing learner performance.

SDG 4 and the Philippine K-12 Reform - The Philippine Department of Education’s (DepEd) adoption of the K-12 system in 2012 was guided by a dual mandate: to align local curricula with international standards while fostering competencies that resonate with national developmental goals (United Nations Organization, 2024). The enhanced, streamlined, and competency-based design seeks to shift assessment from rote memorization toward mastery of practical skills. In the context of TLE—a curriculum strand that blends theory and hands-on practice—this approach demands resources that support experiential learning. However, SDG 4’s emphasis on “high-quality” education is inherently contingent upon the availability of both material and human capital. As Basal (2022) observes, teachers of TLE frequently contend with outdated equipment and insufficient resources, conditions that undermine the curriculum’s competency focus. When educators lack the tools to facilitate authentic skill acquisition, the very purpose of SDG 4—preparing learners for real-world challenges—is compromised.

The Role of Technology and Livelihood Education - TLE occupies a unique position in the Philippine K-12 framework: it is both an academic subject and a vocational pathway that prepares students for immediate employment or further study (United Nations Organization, 2024). In Grade 10, specialization options such as cookery allow learners to explore culinary arts while developing transferable competencies—time management, teamwork, safety protocols—that are valued in the broader economy. The theoretical underpinnings of TLE emphasize experiential learning. The curriculum’s design calls for “hands-on activities” that enable students to translate abstract knowledge into tangible products (United Nations Organization, 2024). Yet Basal (2022) highlights a persistent gap between theory and practice due to resource constraints. This mismatch is particularly acute in rural or underfunded schools where kitchen facilities, modern appliances, or even adequate ingredients may be lacking. The Philippine legislative environment provides some support for addressing these gaps. Section 10.3 of the Enhanced Basic Education Act of 2013 explicitly encourages the creation and advancement of locally made educational resources (Section 10.3). This provision signals a national commitment to developing context-specific materials—potentially including multimedia content—that can mitigate resource shortages.

Multimedia Technologies as Pedagogical Catalysts - The shift from passive to active learning is facilitated by integrating digital media into instructional design. Multimedia technologies enable learners to engage with content dynamically, fostering higher levels of cognitive processing and retention (Kotiash et al., 2022). In the context of TLE, video demonstrations can illustrate complex culinary techniques—such as knife skills or sauce preparation—in a way that written text or static images cannot replicate. Kotiash et al. (2022) argue that continuous use of multimedia in education has profound effects on student development, encouraging creativity among both teachers and students. When instructional videos are aligned with competency-based objectives, they serve not merely as supplementary resources but as integral components of the learning trajectory. They can bridge the gap

between theoretical knowledge and practical execution, especially when physical lab equipment is limited.

Instructional Video Lessons in TLE - Instructional video lessons—short, focused segments that depict step-by-step procedures—have emerged as a popular tool for reinforcing classroom instruction (Insorio & Macandog, 2022). Their utility lies in several key attributes:

- Repetition and Accessibility – Students can pause, rewind, or replay sections at their own pace, facilitating mastery of skills that require precision.
- Visual Demonstration of Process – For kinesthetic learners, seeing a chef manipulate ingredients provides contextual cues that written recipes cannot deliver.
- Consistency Across Sites – Videos standardize the quality of instruction, mitigating disparities caused by teacher expertise or resource availability.

Insorio and Macandog (2022) report that when video lessons are used in tandem with modular text-based materials, learners' comprehension of core concepts improves markedly. This synergistic effect aligns well with the competency-based aims of TLE: students not only learn to cook but also understand the underlying principles—nutrition science, food safety regulations, and cultural significance.

The Multimedia Arts Skillset (MArS) Initiative - Recognizing the pedagogical potential of video lessons, the current study introduces the Multimedia Arts Skillset (MArS)—a structured program that trains students in creating their own instructional videos for TLE subjects. MArS is premised on two interrelated learning outcomes:

- Skill Development – Students acquire technical competencies in filming, editing, and storytelling, which are valuable beyond the classroom.
- Content Mastery – By producing video tutorials on cookery tasks, learners reinforce their own understanding of culinary techniques and safety protocols.

The rationale for MArS stems from the observation that a lack of consistent and comprehensive video tutorials hampers TLE delivery (Basal, 2022). Moreover, the unavailability of functional school laboratories intensifies the need for alternative instructional modalities. MArS offers a dual solution: it compensates for physical resource deficits while fostering digital literacy.

Gaps in Existing Research - While the literature affirms the benefits of multimedia and video instruction, empirical studies specifically targeting Grade 10 cookery learners within the Philippine K-12 context remain sparse. Most investigations either focus on general science or mathematics instruction (e.g., Kotiash et al., 2022) or evaluate technology integration at a national level without delving into subject-specific performance outcomes. Additionally, there is limited evidence on how structured multimedia production programs like MArS affect both learner achievement and teacher facilitation. Basal (2022) notes that TLE teachers struggle with outdated equipment, but does not examine whether student-generated video content can alleviate this challenge or enhance instructional quality.

Alignment with Research Questions -

The proposed action research seeks to address these issues by empirically examining the impact of MArS on learner performance in a controlled experimental setting. The three research questions—concerning pre- and post-intervention performance levels, statistical significance of differences between control and experimental groups, and mean percentage increases—directly correspond to the gaps identified above. By focusing on measurable outcomes (performance task scores) before and after the intervention, the study operationalizes SDG 4's emphasis on evidence-based improvement. Moreover, it evaluates whether a multimedia-centric strategy can deliver tangible gains in competency attainment, thereby informing policy decisions about resource allocation for TLE schools.

Research Questions - This action research aimed to improve the performance task of grade 10 cookery learners through Multimedia Arts Skillset (MArS). Specifically, it sought answers to the following questions:

1. What is the level of the performance task of the control and experimental groups before and after the utilization of the intervention?
2. Is there a significant difference in the performance task of the control and experimental groups before and after the utilization of the intervention?
3. What is the mean percentage increase in the performance task of the learners in both the control and experimental groups?

2. Methodology

Research Design - This study adopted the quasi-experimental using the two-group design. The design incorporates selecting groups to test the variable in which the control of all the key factors is not possible or practical. Moreover, this is used to evaluate the effects of an intervention or establish a cause-and effect relationship between independent and dependent variables. Apparently, the researcher considered this design in as much as the participants in the classes stayed as one group, incapable of disintegration.

Participants - The subjects of this research were on the Grade 10 Aguinaldo and Grade 10 Osmeña students at Doña Francisca Lacsamana de Ortega Memorial National High School for the academic year 2024-2025. Within these classes, the learners were categorized into experimental and control groups. For their performance-based task, students were organized into four groups, each consisting of five members. The experimental group was made up of the four groups from Grade 10 Aguinaldo, while the control group consisted of the four groups from Grade 10 Osmeña. The researcher employed purposive sampling to establish the control and experimental groups, resulting in 20 students in each group, thereby ensuring a thorough and fair representation of both groups.

Intervention - The intervention used in this study is called Multimedia Arts Skillset (MArS). It is a collection of activities formatted as multimedia arts of varying durations which aimed to improve the performance task of grade 10 learners. This is similar to video lessons but only the learners are made to view a full demonstration video to give learners a bird's eye view of the performance task then followed by a one step at a time footage to let the learners follow every step of the activity. What is new in this tool is that, after the learners have finished working with the output, they have the chance to reflect and assess by looking at the different standards set by the Multimedia Arts Skillset (MArS) and have the chance to improve their output before the finalization and submission. It also includes a file copy of the ingredients and the step-by-step procedure as well as the rubrics to be used for the learners to be guided on how their performance task will be evaluated. The video was shared with the learners through their messenger group chat before they engaged in their respective performance task. In addition to that, learners have the flexibility to watch the instructional videos more than once to ensure they receive proper guidance. To ensure the instructional videos' validity, the researcher sought assistance from the validating committee of the school using the DepEd tool designed for validating non-print tools. The intervention was given before their scheduled performance task activity for the third grading period for the school year 2024-2025.

Instrumentation and Data Collection - The researcher developed an instructional video intended as a learning resource to assess the performance task levels of learners. Following the validation of the video and the selection of participants, the researcher proceeded with the intervention. Both pre-laboratory and post-laboratory activities related to the required competencies for the third quarter were conducted with the participants to evaluate their performance task levels. Their performance tasks were assessed using a rubric adopted from the Self-Learning Module of Cookery 10 for the third quarter. The intervention was specifically applied to the experimental group, who viewed the instructional video prior to the scheduled performance task activity, with further discussion incorporated into their class sessions. The outcomes from the pre-laboratory and post-laboratory activities of both the control and experimental groups were compiled for subsequent analysis.

Data Analysis - To answer the first question, the mean score was used to determine the level of performance task of learners before and after the utilization of the intervention. To answer the second question, to determine the significant difference in the performance task of learners before and after the utilization of the intervention, independent t-test was used. Moreover, question number 3 was answered using the formula $\text{posttest mean} - \text{pretest mean} \div \text{pretest mean} \times 100$.

3. Results

3.1 Level of performance task of the control and experimental group before and after the utilization of the intervention

Table 1 presents the level of performance task of the control and experimental groups before and after the utilization of the intervention.

Table 1

Level of performance task of the control and experimental group before and after the utilization of the intervention

	Pre-Lab		Post-Lab	
	Mean Score	Descriptive Equivalent	Mean Score	Descriptive Equivalent
Control	44.25	Satisfactory	53.75	Outstanding
Experimental	45.25	Satisfactory	57.75	Outstanding

Legend: 40.00-49.00 Satisfactory 50-00.60.00 Outstanding

As seen on the table, the control group achieved a mean score of 44.25 in the pre-laboratory activity, which is categorized as Satisfactory. In contrast, the post-laboratory activity resulted in a mean score of 53.75, classified as Outstanding. Notably, the mean score for the post-laboratory activity exceeded that of the pre-laboratory activity, signifying a clear improvement. In a similar manner, Table 1 shows that the experimental group achieved a pre-laboratory mean score of 45.25, which is classified as Satisfactory. Conversely, the post-laboratory assessment yielded a mean score of 57.75, categorized as Outstanding. It is important to note that the post-laboratory mean score surpasses the pre-laboratory score, demonstrating a significant improvement.

More specifically, both groups exhibited a clear upward trajectory in performance, moving from the “Satisfactory” band to the “Outstanding” band after the laboratory activity. The mean score of the control group rose by 9.5 points (from 44.25 to 53.75), representing approximately a 21 % relative increase, whereas the experimental group’s mean increased by 12.5 points (from 45.25 to 57.75), a roughly 28 % relative rise. The larger absolute and relative gains observed in the experimental cohort suggest that the Multimedia Arts Skillset (MArS) intervention amplified learning outcomes beyond what conventional laboratory instruction alone could achieve. When comparing post-intervention results, the experimental cohort’s mean score of 57.75 exceeded the control group’s 53.75 by four points—a difference that translates to an additional $\approx 7\%$ improvement over the control’s gain. The pre-lab scores were very close (44.25 vs 45.25), indicating that random assignment or baseline equivalence was reasonably achieved. Consequently, any post-intervention divergence can plausibly be attributed to the intervention rather than pre-existing disparities.

Practical Implications for SDG 4 - The transition from “Satisfactory” to “Outstanding” aligns with the SDG 4 Target 4.1 objective of ensuring that all learners complete high-quality secondary education that leads to relevant learning outcomes. By elevating students’ performance scores into the upper band, the MArS intervention demonstrates a concrete pathway toward meeting this global mandate within the Philippine K-12 context.

3.2 Test of difference in the level of performance task of the control and experimental groups before and after the utilization of the intervention

Table 2 presents the difference in the Level of performance task of the control and experimental groups before

and after the utilization of the Intervention. As gleaned on the table, the calculated p-value (0.19) exceeds the critical value of 0.05 before the intervention was applied. This suggests that there is no significant difference in the performance levels of learners in either group prior to the intervention. Conversely, the table shows that the computed p-value (0.01) falls below the critical value of 0.05 after the intervention was implemented. This indicates a significant difference in the performance tasks of learners in both the control and experimental groups after the utilization of the intervention

Table 2

Significant differences in the level of performance task of the control and experimental groups before and after the utilization of the intervention

		Mean Score	P-Value	Remarks
Control	Pre-Laboratory	44.25	0.19	Not significant
	Post-Laboratory	53.75		
Experimental	Pre-Laboratory	45.25	0.001	Significant
	Post-Laboratory	57.75		

Legend: alpha at 0.05 level of significance

More specifically, table 2 reports the statistical comparison of mean performance-task scores for the control and experimental cohorts before and after the laboratory intervention. Prior to the intervention, the mean score of the control group was 44.25 ($p = .19$), while the experimental group's pre-lab mean was 45.25 ($p = .001$). In both cases the p-values exceeded the conventional alpha level of 0.05, indicating that there were no statistically significant differences in baseline performance between the two groups. After the laboratory activity, the post-lab means rose to 53.75 for the control group and 57.75 for the experimental group. The computed p-value for this post-intervention comparison fell below the alpha threshold ($p \approx 0.01$), revealing a statistically significant difference in performance levels between the two groups once the intervention had been applied. Thus, while baseline equivalence was confirmed, the MARs-enhanced laboratory produced a measurable improvement that set the experimental group apart from the control cohort at the 5 % significance level.

3.3 Mean percentage increase in the level of performance task of the learners both in the control and experimental groups

Table 3 presents the mean percentage increase in the level of performance task of the learners both in the control and experimental group before and after the utilization of the intervention. The data indicates a significant increase of 21.47% in the performance task levels for the control group, while the experimental group experienced a 27.62% increase. Furthermore, the findings demonstrate that the experimental group achieved a higher mean percentage increase compared to the control group.

Table 3

Mean percentage increase in the level of performance task of the learners both in the control and experimental group

	Pre-Laboratory	Post-Laboratory	Difference	Percentage Increase
Control	44.25	53.75	9.50	21.47
Experimental	45.25	57.75	12.50	27.62

More specifically, table 3 presents the mean percentage increase in the performance task scores of the learners in the control and experimental groups from the pre-laboratory to the post-laboratory assessment. The control group obtained a mean pre-laboratory score of 44.25, which increased to 53.75 in the post-laboratory assessment. This represents a mean difference of 9.50 points, equivalent to a 21.47% increase. Meanwhile, the experimental group obtained a mean pre-laboratory score of 45.25 and a post-laboratory mean score of 57.75. The increase of 12.50 points corresponds to a 27.62% improvement from the pre-laboratory assessment. These results indicate that both groups demonstrated improvement in their performance task scores after the instructional period. However, the experimental group showed a greater improvement than the control group. Specifically, the percentage increase of the experimental group was 6.15 percentage points higher than that of the control group. The larger gain

observed among learners in the experimental group suggests that the intervention may have contributed to greater improvement in their performance task outcomes compared with the learning experience received by the control group.

It is also noteworthy that the pre-laboratory mean scores of the two groups were relatively close, with only a 1.00-point difference between them. After the intervention, the difference between their mean scores increased to 4.00 points in favor of the experimental group. This pattern provides descriptive evidence that learners exposed to the intervention demonstrated greater progress over the course of the study. Nevertheless, the mean percentage increase alone does not establish whether the observed difference between the two groups is statistically significant. Appropriate inferential statistical analysis is therefore necessary to determine whether the improvement in the experimental group can be attributed to the intervention rather than to chance or other possible factors.

4. Discussions

4.1 Level of performance task of the control and experimental groups before and after the utilization of the intervention

The findings revealed that both the control and experimental groups demonstrated improvement in their performance task scores from the pre-laboratory to the post-laboratory assessment. The control group improved from a mean score of 44.25, described as *Satisfactory*, to 53.75, described as *Outstanding*. Similarly, the experimental group improved from a mean score of 45.25 to 57.75, moving from *Satisfactory* to *Outstanding*. Although both groups exhibited improvement, the experimental group obtained the higher post-laboratory mean score, suggesting that exposure to the Multimedia Arts Skillset (MArS) may have provided additional support for learners in performing the required cookery tasks. The improvement in both groups may be explained partly by continued exposure to classroom instruction, laboratory activities, practice, and familiarity with the required competencies. However, the greater improvement observed among learners in the experimental group suggests that MArS provided instructional support beyond ordinary classroom and laboratory experiences. Rather than relying solely on verbal explanation or written procedures, the learners were provided with a complete visual demonstration followed by step-by-step footage of the task. They were also given access to the ingredients, procedures, assessment standards, and rubrics associated with the activity. Moreover, they could view the instructional materials repeatedly before undertaking the performance task.

These features are particularly relevant in Cookery, where many learning outcomes involve procedural and psychomotor skills. Learners are expected not only to remember information but also to perform a sequence of actions accurately and safely. Seeing a procedure demonstrated may help learners understand details that are sometimes difficult to communicate through written directions alone, such as the order of procedures, handling of materials, preparation techniques, timing, and expected characteristics of the final product. The findings are consistent with Aboc (2024), who reported that cookery students recognize the advantages of online video tutorials and that visual and auditory demonstrations can assist learners in developing cooking skills. In a skills-oriented subject, video-based materials may serve as useful supplements to classroom demonstration because learners can review the procedures according to their individual learning pace. Unlike a teacher demonstration that occurs only at a particular moment in class, a recorded demonstration can be paused, replayed, and reviewed when learners need clarification.

The results also support the findings of Bullo (2021), who reported the usefulness of video lessons in facilitating learners' understanding even when direct teacher assistance is limited. Although the context of the present study differs, the underlying instructional principle is similar: video materials provide learners with an additional source of explanation and demonstration that can be accessed when needed. In the case of MArS, the multimedia materials did not replace the teacher but supplemented classroom instruction and provided learners with continuing guidance as they prepared for the performance task. The findings can also be understood in relation

to the nature of the MArS intervention itself. MArS extends beyond merely presenting a video. After learners complete their initial output, they are given an opportunity to reflect on their work using established standards and to make improvements before final submission. This feature may support the development of self-assessment and self-regulated learning. Learners are not only shown *how to perform a task*; they are also encouraged to consider *how well they performed it* and what needs to be improved. Therefore, the movement of the experimental group from Satisfactory to Outstanding performance suggests that multimedia-supported instruction can be meaningfully integrated into competency-based TLE instruction. For practical subjects such as Cookery, multimedia resources may be particularly valuable when learners need repeated demonstrations, when instructional time is limited, or when access to individual teacher guidance during laboratory work cannot always be provided.

4.2 Test of difference in the level of performance task of the control and experimental groups before and after the utilization of the intervention

The statistical findings showed that the control and experimental groups did not significantly differ in their performance before the intervention. This is an important finding because it indicates that the two groups began the study with relatively comparable levels of performance. Their pre-laboratory mean scores were also very close, with the control group obtaining 44.25 and the experimental group obtaining 45.25. The small difference at baseline provides a reasonable basis for comparing their subsequent performance. In quasi-experimental research, establishing initial comparability is important because the researcher works with naturally existing groups rather than randomly assigning individual learners. The absence of a significant difference before the intervention suggests that the groups were sufficiently similar in terms of their initial performance task outcomes for the purposes of the study. Consequently, the differences observed following the intervention are less likely to be explained simply by large pre-existing differences between the two groups.

Following the implementation of MArS, however, the experimental group obtained a higher post-laboratory mean score than the control group, and the statistical analysis indicated a significant difference in their post-intervention performance. This finding provides evidence that the use of MArS was associated with improved performance task outcomes among the learners who received the intervention. The result may be attributed to several instructional characteristics of MArS. First, the multimedia presentation provided learners with a clear model of the expected procedure and output. Second, the step-by-step presentation may have reduced uncertainty by dividing a complex cookery task into manageable stages. Third, the opportunity to replay the material enabled learners to revisit procedures that they had not fully understood during the first viewing. Fourth, the availability of assessment criteria and rubrics made performance expectations more explicit. Finally, the reflection and revision component encouraged learners to evaluate their own output before final submission.

The finding is also consistent with Ducena and Ducena (2024), who reported that both lecture-demonstration and contextualized video-assisted instruction were effective in teaching cookery-related skills, with video-assisted lessons demonstrating greater effectiveness in improving learners' performance. This supports the use of video not as a substitute for classroom instruction but as an instructional enhancement that can reinforce teacher demonstration and provide learners with repeated access to procedural information. Similarly, De Chavez (2024) found that procedural video-aided instruction was beneficial in the teaching and learning of Cookery and was associated with improvement in students' academic performance compared with reliance on traditional methods alone. The present findings therefore add to emerging evidence supporting video-assisted approaches in skill-based learning environments.

From a pedagogical perspective, the significant post-intervention difference may also indicate that the effectiveness of multimedia instruction depends not merely on the presence of technology but on the way the multimedia material is organized. MArS combines visual modeling, sequential instruction, repeated access, explicit performance standards, and opportunities for reflection. Thus, its contribution may lie in the structured integration of these elements rather than in video viewing alone. The findings further suggest that multimedia-assisted instruction can complement experiential learning in TLE. Cookery remains a hands-on subject, and actual

performance cannot be replaced by watching a video. Nevertheless, multimedia materials can prepare learners for hands-on activity by enabling them to observe the procedure beforehand, anticipate the sequence of actions required, recognize appropriate standards, and enter the laboratory with a clearer understanding of what they are expected to accomplish.

4.3 Mean percentage increase in the level of performance task of the learners in the control and experimental groups

The findings showed improvement in both groups; however, the magnitude of improvement was greater among learners exposed to MArS. The control group increased from a mean score of 44.25 to 53.75, representing an increase of 9.50 points or 21.47%. In comparison, the experimental group increased from 45.25 to 57.75, representing an increase of 12.50 points or 27.62%. Thus, the experimental group demonstrated a percentage increase that was *6.15 percentage points higher* than that of the control group. Although the improvement of the control group indicates that regular classroom and laboratory instruction was also beneficial, the larger increase observed in the experimental group suggests that MArS provided additional instructional value. The greater percentage increase may be associated with learners' ability to access and revisit the multimedia materials before engaging in their performance tasks. In a conventional demonstration, learners must simultaneously observe, remember, and later reproduce several procedures. Important details may be missed, particularly when a task consists of multiple stages. MArS reduces this limitation because learners can repeatedly examine particular steps and compare their understanding with the demonstrated process. This finding is consistent with Krishnankuttyrema and Shilov (2020), who examined the use of pre-laboratory videos and observed improvements in students' learning outcomes following the implementation of the videos. Pre-activity multimedia materials may therefore function as a form of preparation that enables learners to become familiar with procedures before actual laboratory work.

For the present study, the usefulness of MArS may also extend beyond advance preparation. Learners received a complete overview of the performance task and subsequently viewed the procedure one step at a time. They could then examine the standards and rubric and use these as a basis for reflecting on and improving their own work. This cycle of *previewing, observing, performing, evaluating, and improving* may help explain why the experimental group demonstrated a greater gain. The results also indicate that multimedia resources can support learner autonomy. When students can independently review instructional content rather than relying exclusively on immediate teacher assistance, they are able to take greater responsibility for clarifying procedures and preparing for tasks. This may be especially beneficial in classes where the teacher must simultaneously supervise several groups of learners engaged in practical activities. Nevertheless, the percentage increase should be interpreted together with the statistical findings rather than as independent evidence of statistical significance. Percentage gain describes the magnitude of improvement, while inferential analysis determines whether observed differences are statistically meaningful. Taken together, the descriptive and inferential findings of the study provide converging evidence that the experimental group demonstrated stronger performance outcomes after being exposed to MArS. Overall, the findings suggest that Multimedia Arts Skillset can serve as a useful supplementary instructional strategy in Grade 10 Cookery. Its value lies not simply in introducing technology into instruction but in using technology to make processes visible, repeatable, accessible, and connected to explicit standards of performance.

5. Conclusion

This action research examined the effectiveness of the Multimedia Arts Skillset (MArS) in improving the performance tasks of Grade 10 Cookery learners. Based on the findings, both the control and experimental groups improved from the pre-laboratory to the post-laboratory assessment. However, learners in the experimental group demonstrated a greater improvement and obtained higher post-intervention performance scores than those in the control group. The findings indicate that MArS can be an effective supplementary instructional strategy for teaching performance-based competencies in Cookery. By providing learners with a complete demonstration of

the task, step-by-step video guidance, written procedures, assessment rubrics, opportunities for repeated viewing, and opportunities for reflection and improvement, MARs offers multiple forms of support throughout the learning process.

The effectiveness of MARs should therefore not be attributed to video presentation alone. Rather, its instructional value appears to lie in the combination of visual demonstration, procedural scaffolding, learner-controlled review, explicit performance criteria, and self-assessment. These features provide learners with greater opportunities to understand what they are expected to perform and to evaluate the quality of their own work. The study further demonstrates how digital resources can complement, rather than replace, hands-on learning. Practical competencies in Cookery still require actual manipulation of materials, application of procedures, observation of safety practices, and production of tangible outputs. Multimedia instruction can support these activities by preparing learners before laboratory work and providing an accessible reference when procedures need to be reviewed.

While the results are encouraging, they should be interpreted within the context of the study. The research involved Grade 10 learners from two existing classes in one school and employed purposive sampling within a quasi-experimental design. Therefore, the findings should not automatically be generalized to all Grade 10 learners, TLE specializations, or school settings. Further implementation with larger groups, additional competencies, other grade levels, and different TLE specializations would provide stronger evidence regarding the broader applicability of MARs. Nevertheless, within the context of this action research, the findings provide practical evidence that a carefully designed multimedia intervention can strengthen performance-based instruction and support competency development among Grade 10 Cookery learners.

Implications for teachers - The findings highlight the important role of teachers in designing multimedia materials that support, rather than merely digitize, instruction. Teachers may consider developing short and focused video demonstrations for procedures that learners commonly find difficult. These resources can be used before laboratory activities to familiarize learners with the task and can remain available during the learning process for review. MARs also demonstrates the importance of connecting instructional materials with assessment. Providing learners with the rubric and performance standards before completing a task can make learning expectations more transparent. Teachers may therefore integrate demonstrations, step-by-step procedures, and assessment criteria so that learners understand not only what to do but also what constitutes high-quality performance. Moreover, multimedia materials may help teachers manage practical classes more effectively. When learners have access to reusable instructional demonstrations, some routine procedural questions can be addressed through the learning resource, allowing teachers to devote more attention to learners who require individualized assistance. However, teacher guidance remains essential, particularly in monitoring safety, correcting misconceptions, providing feedback, and facilitating actual skill development. Teachers should also view multimedia materials as resources that can be continuously improved. Learner difficulties and feedback can be used to identify portions of the video that require clearer demonstrations, additional examples, slower explanations, or supplementary instructions.

Implications for Learners and Learning - For learners, MARs provides opportunities for more flexible and self-directed learning. The ability to pause, replay, and review instructional materials allows learners to proceed according to their own level of understanding. This may be particularly useful in procedural subjects, where learners differ in the amount of repetition required before they can confidently perform a task. The intervention may also encourage learners to become more active participants in their own learning. Instead of depending solely on the teacher for immediate explanations, students can consult the instructional materials, compare their performance with established standards, identify areas needing improvement, and revise their work. Such practices can contribute to the development of self-monitoring, responsibility, and independent learning habits. The reflection component of MARs is particularly important. Encouraging learners to examine the quality of their output before submission shifts assessment from being solely teacher-driven toward a process in which learners themselves become involved in evaluating their performance. Over time, this practice may help students develop a clearer understanding of quality and become more capable of identifying and correcting their own errors. At the

same time, multimedia learning should not reduce opportunities for actual performance. Viewing instructional videos is most beneficial when it leads to active application. Therefore, MArS should remain closely connected with laboratory work, practice, feedback, and authentic performance tasks.

Implications for the School - At the school level, the findings suggest that investment in well-designed digital learning resources can strengthen the delivery of competency-based subjects such as TLE. Schools may encourage teachers to develop, validate, organize, and share instructional video materials that address competencies requiring repeated demonstrations. A school-based repository of validated multimedia resources may be developed so that instructional materials can be reused and improved across school years. Such a repository could reduce duplication of effort among teachers and provide learners with more consistent access to quality instructional support. School administrators may also consider providing professional development related to instructional video production, multimedia design, assessment integration, and responsible use of digital technologies. Teachers do not necessarily require highly sophisticated equipment; what is more important is that multimedia materials are accurate, understandable, aligned with curriculum competencies, and appropriate for the learners.

The findings also have implications for resource-constrained settings. Multimedia demonstrations cannot replace essential laboratory facilities, ingredients, equipment, or actual hands-on experience. However, they may help schools maximize available resources by preparing learners before they enter the laboratory, reducing unnecessary repetition of demonstrations, and allowing instructional materials to remain available even outside scheduled classroom periods. Finally, school leaders may support the systematic evaluation of innovations such as MArS rather than adopting technology solely because it is available. The present action research demonstrates the value of examining learner outcomes before and after an intervention. Similar evidence-based approaches can help schools determine which instructional innovations should be retained, revised, expanded, or discontinued.

Implications for Future Practice and Research - Future implementation of MArS may examine its use across other TLE competencies and specializations in which procedural knowledge and performance are central. Further studies may also involve larger samples, multiple schools, longer intervention periods, and additional indicators of learning such as retention, learner engagement, self-efficacy, and ability to perform skills independently. Researchers may also investigate which components of MArS contribute most strongly to learning—for example, the full demonstration, step-by-step video, repeated viewing, provision of rubrics, or reflection component. Such research would help refine the intervention and identify the most effective combination of multimedia and pedagogical features. Future research could additionally examine learners' perceptions of MArS, including which features they find most useful, what difficulties they experience when accessing the materials, and how frequently they replay or consult specific portions of the instructional resources. These findings could provide a more complete understanding of not only whether MArS works, but also how and why it supports learning.

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