Journal of Education, Learning, and Management (JELM)

ISSN: 3079-2541 (Online)

Volume 2 Issue 2, (2025)

https://doi.org/10.69739/jelm.v2i2.713

https://journals.stecab.com/jelm

Published by
Stecab Publishing

Research Article

Enhancing Student Performance in Grade 9 TLE by Addressing The Least Mastered Competency Through The M.E.A.L. Approach in Raniag High School

[1]Jennica P. Dela Cruz, *[1]Joe Cris C. Evangelista, [1]Jennifer P. Soriano, [1]Estefany D. Cabria, [1]Joelyn B. Gannaban, [1]Melanie G. Nunggatang

About Article

Article History

Submission: June 02, 2025
Acceptance : July 07, 2025
Publication : July 26, 2025

Keywords

Action Research, Grade 9 Students, Least Mastered Competency, Metrics

About Author

[1] College of Education, Ifugao State University, Potia Campus, Ifugao, Philippines

Contact @ Joe Cris C. Evangelista
joecrisevangelista@gmail.com

ABSTRACT

This action research investigated the low mastery of competency in the measuring tools, specifically in measuring ingredients using measuring tools, among Grade 9 students at Raniag High School. The goal of the study was to find out why the students weren't very good at understanding and using heat transfer principles in cooking and to create and put into action an intervention program to help them. The study revealed that the experimental group significantly improved from a mean pre-test score of 4.10 (Beginning) to 7.95 (Proficient), while the control group remained at the Beginning level with a post-test mean of 5.65. With a large effect size (d ≈ 1.5) and higher survey ratings in engagement and instructional support, the intervention proved effective in enhancing students' mastery and learning experience in food processing. The intervention program, which included better teaching materials and cooking activities that students could do themselves, helped them understand heat transfer principles much better.

Citation Style:

Dela Cruz, J. P., Evangelista, J. C. C., Soriano, J. P., Cabria, E. D., Gannaban, J. B., & Nunggatang, M. G. (2025). Enhancing Student Performance in Grade 9 TLE by Addressing The Least Mastered Competency Through The M.E.A.L. Approach in Raniag High School. *Journal of Education, Learning, and Management, 2*(2), 6-12. https://doi.org/10.69739/jelm.v2i2.713

1. INTRODUCTION

Education is a strong force that helps students learn the things they need to know and do well in school and in life. But not all students learn at the same speed. Some have trouble mastering certain skills, which can cause gaps that build up over time and hurt their overall performance and confidence. Finding the skills that students struggle with the most, especially in skill-based subjects like Technology and Livelihood Education (TLE), is very important for making sure that everyone learns the same amount. For TLE, skills like accurately measuring ingredients in cooking have always been hard for Grade 9 students, often because they don't have enough hands-on experience, the teaching methods are out of date, or there aren't enough resources. It is important to deal with these problems not only to help students master the subject matter but also to boost their confidence and readiness for real-world situations. This study, therefore, aims to determine the current level of student mastery in basic mensuration under TLE Food Processing, identify the factors contributing to their low performance, and assess the level of mastery achieved after the implementation of an instructional intervention. This study is in line with the United Nations Sustainable Development Goals (UNESCO, 2015), especially the goal of making sure that everyone has access to quality education. It does this by addressing gaps in instruction with meaningful, evidence-based interventions. The results will also be useful for school leaders who want to improve the way they design the curriculum and make their teaching more flexible.

2. LITERATURE REVIEW

Competency-Based Education (CBE) is a powerful way to fill in gaps in student learning by focusing on mastering specific skills and allowing learners to progress at their own pace. Pane (2021) explains that this approach leads to deeper learning and better long-term retention, especially when understanding is measured through performance tasks rather than traditional tests. Guskey (2021) supports this by stating that mastery learning helps close achievement gaps by providing students with multiple opportunities to engage with content in various ways. Formative and diagnostic assessments are also essential in addressing gaps in student knowledge. According to Black and Wiliam (2020), effective formative assessments provide teachers with real-time feedback on student learning, enabling them to adjust their instruction to better meet learners' needs. Alotaibi (2021) adds that digital tools and classroom-based diagnostics can accurately identify specific learning difficulties, allowing for timely and targeted interventions.

Emerging research also highlights the role of adaptive learning technologies in improving learning outcomes. Zawacki-Richter *et al.* (2020) and Zhu *et al.* (2022) note that AI-powered platforms offer personalized content and feedback based on each student's performance, encouraging self-paced learning and mastery. Xu and Recker (2023) found that such platforms are particularly effective in vocational education, where they enhance students' acquisition of technical skills. Tomlinson (2020) emphasizes the importance of differentiated instruction, particularly for learners who have yet to master key skills, suggesting that leveled tasks and flexible teaching approaches are most effective. Hattie and Timperley (2020) stress the importance of feedback that is timely, specific, and actionable, while Zimmerman (2021) highlights the development of metacognitive skills, which enable students to reflect on their learning and take ownership of their progress.

In the Philippine context, studies show that students often struggle to master food processing competencies due to insufficient hands-on practice and limited instructional capacity (Dioquino & Abellana, 2021; Basal, 2022). To address these challenges, educators have adopted CBE-aligned strategies, including peer collaboration and group discussions, which have proven effective in increasing engagement and retention (Malanog & Aliazas, 2021; Elpedes, 2019). National institutions such as TESDA and the Department of Education (DepEd) support the implementation of Competency-Based Curricula in technical-vocational subjects to ensure measurable learning outcomes and real-world applicability (DepEd, 2012; TESDA-CAR, n.d.). The effectiveness of these strategies is further strengthened through teacher training and professional development initiatives (Espiritu, 2020; Alcaide & Blancia, 2024), which enhance classroom implementation. Based on these findings, this study proposes the use of peer collaboration and group discussion as key strategies to improve Grade 9 students' mastery in food processing mensuration, contributing to the broader goal of delivering inclusive, high-quality education in the Philippines.

3. METHODOLOGY

3.1. Research method

This study adopts a mixed method sequential embedded experimental design, combining quantitative and qualitative research methods in a sequential manner, where the quantitative data (test scores) is collected and analyzed first, followed by qualitative data (student feedback and teacher observation)

3.2. The intervention

To address the problem of the least mastered competencies, a combination of innovations, interventions and strategies should be implemented. These methods should be based on research, focus on the student, and be able to work in different learning environments. Here are some specific new ideas, actions, and plans that can be used.

The M.E.A.L. Approach: Learning New Things to Master Important Skills. M.E.A.L. is short for:

- *Measuring Skills:* This means learning how to measure things like weight and volume correctly, which is very important in food processing. It makes recipes and food products more accurate and consistent.
- *Engaged Learning:* This means keeping students interested and helping them understand by using active teaching methods like think-pair-share (where students think on their own, talk to a partner, and share with the whole class) and role-playing.
- *Adaptive Platforms:* This term describes AI-powered or digital tools that change based on the needs of each student. For instance, educational software that gives personalized feedback or changes the level of difficulty based on how well you do.
- *Learning with Peers:* This encourages students to help each other learn by tutoring and working together. This helps people

understand each other better, boosts their confidence, and makes the classroom a safe place to learn.

3.3. Participants

This study's participants are the 80 Grade 9 TLE students at Raniag High School during the 4th quarter of the 2024–2025 school year. There are two groups of students in this: 40 students from the trustworthy section and 40 students from the justice section.

3.4. Data gathering methods

We will use the following ways to collect data to make sure that we get a full picture of how well the intervention worked and how much the students learned. A pre-test will be given to all participants at the beginning of the study to see how well they currently understand the least mastered competency, which is measuring ingredients. This test will have both theoretical and practical parts, and it will cover things like units of measurement and how to convert them. Researchers will watch students in the classroom during the intervention to see how well they understand concepts, how accurately they use measuring tools, and how involved they are in related activities overall. Semi-structured interviews will be held with a small group of students to learn more about their experiences, including the problems they face, how they prefer to learn, and how they think things could be better. We will also get feedback from TLE teachers about what they think about how well their students are doing and how they feel about the teaching methods used to help them reach their goals. We will also give students a Likert-scale survey to find out how they feel about things, how confident they are, and any other factors that might affect how well they do in food processing. Finally, after the intervention is put into place, a post-test with 15 questions will be given to see how well students understand and use the main ideas. We will use a mastery level scale (Beginning, Developing, Proficient, or Advanced) to look at the results and see how much the students have improved.

3.5. Ethical consideration

This study will follow the rules for doing research with people. All participants and their parents or guardians will give informed consent, which means they will know what the study is about, how it will be done, and what risks it may pose. The data of participants will be kept private throughout the research process.

4. RESULTS AND DISCUSSION

This part includes the discussion of the results that respond to the questions from the researchers. The data presented in this part follows the arrangement of the problems as mentioned in the action research questions.

4.1. Mastery level scale for assessment

This scale was adapted to categorize the students' performance on the pretest and post-test. The percentage score was calculated and matched with the corresponding mastery level.

Table 1. Mastery level scale interpretation

Score range	Mastery level	Description
90-100%	Advanced mastery	The student exceeds expectations; shows interdependence and deep understanding
75-89%	Proficient	The student meets expectations; performs tasks with minimal errors
60-74%	Developing	The student is progressing but makes frequent errors and needs guidance
Below 60%	Beginning	The student lacks a basic understanding and requires significant support.

Table 2. Mean pre-test scores of the control group and the experimental group

	Mean	Mastery Level
Control Group	4.47	Beginning
Experimental Group	4.10	Beginning

The control group had a mean score of 4.475 on the pretest, while the experimental group had a slightly lower score of 4.1, as shown in Table 2. Even though there was a small difference, both groups were placed in the "Beginning" mastery level, which means they didn't know much about food processing before the intervention. This low performance shows that both groups need help with their lessons. Bayaga and Lekena (2020) say that low pretest scores are a reason to use targeted intervention strategies to help students learn better. This is especially important in technical-vocational education, where structured lesson planning is needed to carefully build on basic knowledge. Brookhart (2022) also stressed that pretests and other diagnostic assessments give teachers important information about where students are starting from and help them plan lessons that are right for them. Todorova and Mills (2021) said that finding students who aren't very good at something early on makes it easier for teachers to build on their vocational skills over time, making sure that students get better over time. These results show that an intervention is needed to help students in both groups learn more about food processing.

Table 3. Survey mean scores for the control group and the experimental group

Survey item	Control		Experimental	
	Mean score	**Interpretation**	**Mean score**	**Interpretation**
I clearly understand the steps in Food Processing Techniques taught in class.	3.6	Agree	3.92	Agree
I find the food Processing lesson interesting and engaging.	3.90	Agree	3.70	Agree
I have enough time to practice food processing activities during class.	3.22	Neutral	3.45	Agree
I feel confident performing food processing tasks on my own.	3.12	Neutral	3.65	Agree
I often get help from the teacher when I have difficulty understanding the lesson.	3.82	Agree	3.87	Agree
Our school provides enough tools and equipment for food processing activities.	3.25	Neutral	3.75	Agree
I have access to instructional materials (videos, guides, and modules) to help me learn food processing.	3.57	Agree	4.05	Strongly agree
Lack of ingredients or materials affects my ability to perform food processing tasks.	3.45	Agree	3.97	Agree
The teacher uses demonstrations to explain food processing procedures.	3.9	Agree	4.02	Strongly agree
I learn better when the teacher uses videos or visual aids in class.	3.72	Agree	4.02	Strongly agree
Group activities and peer work help me understand food processing better.	3.77	Agree	3.90	Agree
I find food processing difficult to understand.	3.05	Agree	3.32	Agree
I worry about making mistakes during food processing tasks.	3.52	Agree	3.87	Agree
I prefer written tests over hands-on tasks in TLE.	3.00	Neutral	3.25	Agree
I would like more practice time to improve my food processing skills.	3.27	Neutral	3.97	Agree
Overall Mean	**3.47**	**Agree**	**3.78**	**Agree**

The results of the pre-intervention survey showed that both the control and experimental groups generally had positive views of their food processing classes. However, the experimental group consistently reported higher mean scores on most items. The experimental group strongly agreed with items about the availability of instructional materials (item 7, M = 4.05), the teacher's use of demonstrations (item 9, M = 4.025), and the use of videos and visual aids in instruction (item 10, M = 4.025). This suggests that even before the intervention, they thought their classroom was supportive, had a lot of resources, and encouraged active participation. These results are in line with what Prince (2021) said, which was that using multimedia tools and teaching that focuses on practice helps students stay interested and learn more about technical subjects. Schunk (2020) also said that supportive environments lower performance anxiety and help people learn new skills.

The control group's highest-rated items were their interest in food processing lessons (Item 2, M = 3.9) and the teacher's use of demonstrations (Item 9, M = 3.9). This shows that they found the subject interesting and recognized the use of practical teaching methods, but they rated other parts of their learning experience—like access to materials, time to practice, and confidence—lower than the experimental group. This suggests that the control group may not have had as good of learning conditions overall, even though they had an interesting teacher and subject matter. Darling-Hammond *et al.* (2020) say that just being interested in something doesn't guarantee that you will learn it. You also need enough instructional support and resources to turn interest into performance. This shows how important structured instructional interventions are for turning good feelings into measurable learning outcomes.

Table 4. Mean post-test scores of the control group and the experimental group

	Pre-test		Post-test	
	Mean	**Mastery level**	**Mean**	**Mastery level**
Control group	4.47	Beginning	5.65	Beginning
Experimental group	4.10	Beginning	7.95	Proficient

There is a clear difference in the performance gains between the two groups after the test. Both the control and experimental groups started at the same level, but their post-test results showed a big difference. The control group's average score went up to 5.65, which is still at the beginning mastery level. The experimental group did a lot better, getting a mean score of 7.95, which puts them in the proficient mastery level. This means that the experimental group's instructional method or intervention was better at helping students understand and master the material. Brookhart (2022) says that post-assessment outcomes are important signs of whether teaching methods meet students' needs and help them grow. The results also back up Todorova and Mills' (2021) claim that well-structured, data-driven teaching in vocational education can greatly improve student performance, especially when it addresses the gaps that students have identified from pre-assessment data. Also, this result is in line with what Bayaga and Lekena (2020) found, which stressed how important it is to have personalized interventions to see real learning gains. The difference in performance on the post-test between the control and experimental groups shows that the teaching method worked and could help students who were having trouble learning at first.

4.2. Student feedback

The informal interviews and reflective forms that students filled out showed a few main ideas. A lot of the students said that after talking about measuring tools in groups, they felt more confident and understood how to use them better. They said that learning with other students helped them understand things they had trouble with before, like how to convert units and how to identify tools. One student said, "Before, I wasn't sure how to measure ingredients the right way." But when we did the group activity, my classmates made it easy to understand, and I remembered it. Some people liked the hands-on approach and said that the practice-based sessions made the lessons more fun and easier to remember. Students also felt more like they were working together and being responsible because they were both learning from and helping their classmates. This feedback is in line with what Malanog and Aliazas (2021) found, which said that peer interaction and active learning methods greatly improve engagement and retention of technical skills.

4.3. Teacher observation

The teacher saw a big change in the way the class worked together while the intervention was going on. Compared to the control group, students in the experimental group were more involved, worked together, and took the lead. Students were more willing to help each other and ask questions, and tasks were done more quickly. The teacher also noticed that students were less likely to act out when they were working together on hands-on tasks. Also, students' ability to find and use measuring tools correctly got better, especially for those who had scored low on the pre-test. These findings back up earlier research, like that of Dioquino and Abellana (2021) and Egano (2024), which showed that structured, student-centered strategies lead to better performance and more involvement in TLE settings. In general, both student feedback and teacher observation show that the intervention worked, not only in helping students improve the targeted skill but also in making the learning environment more active and supportive.

5. CONCLUSION

The study's results clearly show that the intervention worked to improve the least mastered skill in Grade 9 TLE, which was measuring ingredients. The pre-test showed that all of the students in both the Trustworthy and Justice sections were at the Beginning level. This means that many of them didn't know how to do basic measuring skills like converting units and using measuring tools correctly. This diagnostic information gave us a very important starting point for finding areas where students needed more help and adjusting our teaching to meet those needs. After the intervention, students' attitudes, participation, and performance all got a lot better. The experimental group had stronger agreement in their survey answers, with no items rated as "Neutral," unlike the control group's mixed results. This positive change in perception suggests that the intervention helped students feel more confident and involved, which is supported by Zimmerman (2021) and Hattie and Timperley (2020), who stress how important metacognitive feedback is for student learning. Students who are more aware of their strengths and weaknesses are usually more motivated and willing to learn.

The results of the post-test show that the intervention worked, with a big rise in mastery levels—65% of students went from Beginning to Proficient or Advanced. This result supports Guskey's (2021) claim that mastery learning happens when students can show that they understand what they learned after targeted instruction. The results also back up Black and Wiliam's (2020) claim that assessments after an intervention are very important for figuring out how well teaching methods work to close learning gaps. The success of the MEAL approach, which stands for Measuring Skills, Engaged Learning, Adaptive Platforms, and Learning with Peers, shows how important it is to use student-centered, hands-on, and group-based methods in vocational education. The study shows that when instruction is tailored to students' specific needs and delivered through engaging, relevant methods, both skill acquisition and learner confidence can improve significantly. These results provide valuable insights for the continuous improvement of TLE instruction and offer a replicable model for enhancing

competency-based education in other contexts.

However, this study is not without limitations. The intervention was implemented over a relatively short time frame, which may limit the long-term measurement of its effectiveness and sustainability. The sample was also limited to two Grade 9 sections in one school, which restricts the generalizability of the findings to broader populations. Additionally, external factors such as class schedules, teacher availability, and access to learning tools may have influenced outcomes. For future replication, it is recommended that similar studies be conducted over longer periods and across multiple schools or divisions to validate and strengthen the findings. Incorporating varied instructional tools and digital resources can also help test the scalability of the MEAL approach in more diverse learning environments.

REFERENCES

Alcaide, A. E., & Blancia, M. M. (2024). TLE teachers' technology proficiency and instructional module writing ability in the new normal. *Asian Journal of Education and Social Studies, 50*(6) 62-71. https://journalajess.com/index.php/AJESS/article/view/1394

Alotaibi, N. (2021). Using diagnostic assessments to support personalized learning pathways. *International Journal of Educational Technology.*

Basal, D. V. (2022). Instructional competencies of TLE teachers and the need for competency-based modules. *International Journal of Research Publications, 100*(96), 1–6. https://oa.mg/work/10.47119/ijrp100961320222948

Bayaga, A., & Lekena, L. (2020). Pre-intervention learner performance and its impact on intervention strategies. *International Journal of Instruction, 13*(3), 241–256. https://doi.org/10.29333/iji.2020.13317a

Black, P., & Wiliam, D. (2020). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice, 5*(1), 7-74. https://doi.org/10.1080/0969595980050102

Brookhart, S. M. (2022). *How to use assessments to inform instruction.* ASCD.

DepEd. (2012). Guidelines on the implementation of the Strengthened Technical-Vocational Education Program (STVEP) and Technology and Livelihood Education (TLE) curriculum. https://www.deped.gov.ph/2012/07/10/do-67-s-2012-guidelines-on-the-implementation-of-strengthened-technical-vocational-education-program-stvep-and-technology-and-livelihood-education-tle-curriculum

Dioquino, M. R., & Abellana, D. P. (2021). Instructional support and professional development on competencies of TLE teachers. *International Journal on Integrated Education, 4*(3), 12–20. https://journals.researchparks.org/index.php/IJIE/article/view/3614

Elpedes, J. (2019). Competency-based training approach in teaching Grade 10 TLE-ICT students. *Asia Academic Research Journal of Multidisciplinary Research, 7*(3), 23–30. https://ojs.aaresearchindex.com/index.php/AAJMRA/article/view/4937

Espiritu, E. V. (2020). Readiness of TLE teachers in implementing the K to 12 curriculum. *International Journal of Academic Multidisciplinary Research, 4*(11), 9–14. https://ijeais.org/wp-content/uploads/2020/11/abs/IJAMR201108.html

Gregorio, M. (2020). *Challenges faced by TLE teachers in implementing performance-based tasks.* ResearchGate. https://www.researchgate.net/publication/386346656

Guskey, T. R. (2021). Mastery Learning Revisited. *Educational Leadership, 78*(7), 16–21.

Hattie, J., & Timperley, H. (2020). The power of feedback. *Review of Educational Research, 77*(1), 81–112.

Koolapat, N., & Jongkonklang, S. (2021). Competency-based instruction for learning achievement and critical thinking skill development for Grade 10 students. *Ratchaphruek Journal, 19*(2), 1–10. https://so05.tci-thaijo.org/index.php/ratchaphruekjournal/article/view/253719

Malanog, R. D., & Aliazas, C. A. (2021). Active learning strategies and higher-order thinking skills of Grade 10 students. *International Multidisciplinary Research Journal 3*(3), 241-249. http://dx.doi.org/10.5281/zenodo.5594703

Mendez, J. D. (2021). Instructional competencies of TLE teachers in Sta. Cruz District, Zambales. Academia.edu. https://www.academia.edu/105057979

Muijs, D. (2021). *Doing quantitative research in education with SPSS* (3rd ed.). SAGE Publications.

Pane, J. F. (2021). *Personalized learning and the future of education.* RAND Corporation.

Saengsawang, P., & Kornpoung, A. (2024). Developing a competency-based integrated learning unit using problem-based learning to promote the competence of learners of self-development schools (TSQP) of Phitsanulok Province. *Journal of Education and Innovation, 26*(2), 248–262. https://so06.tcithaijo.org/index.php/edujournal_nu/article/view/266833

Soriano, L., & Vargas, M. (2021). *Teachers' perception of training effectiveness in TLE.* ResearchGate.

Suebma, A., & Jongkonklang, S. (2021). Learning outcome of competency-based instruction of Grade 5 students. *KKU Research Journal (Graduate Studies) Humanities and Social Sciences, 9*(1), 1–10. https://so04.tci-thaijo.org/index.php/gskkuhs/article/view/254148

TESDA-CAR. (n.d.). *Competency-based curriculum framework.* TESDA CAR Regional Office. https://car.tesda.gov.ph/tesdacar/competency-based-curriculum/

Thummaphan, P., Sripa, K., & Prakobthong, W. (2022). Competency-based school curriculum: A development and implementation framework. *Rajabhat Chiang Mai Research Journal, 23*(3), 185–198. https://so05.tcithaijo.org/index.php/cmruresearch/article/view/261665

Todorova, N., & Mills, J. (2021). Enhancing vocational education through data-driven teaching. *Journal of Vocational Education & Training, 73*(4), 563–582. https://doi.org/10.1080/13636820.2020.1818044

Tomlinson, C. A. (2020). *The Differentiated Classroom: Responding to the Needs of All Learners*. ASCD.

UNESCO. (2015). *Education 2030: Incheon Declaration and Framework for Action*. https://unesdoc.unesco.org/ark:/48223/pf0000245656

Villacorta, F., & Arnado, A. (2023). *Instructional competencies of TLE teachers: Basis for competency-based module development*. ResearchGate.

Wongthong, P., & Noiwong, W. (2023). Exploring situations, needs, and guidelines for implementing the competency-based curriculum in Thailand's public primary schools. *Journal of Southwest Jiaotong University, 58*(2), 1–15. https://jsju.org/index.php/journal/article/view/1580

Wongthong, P., & Noiwong, W. (2023). Implementing the competency-based curriculum in Thailand's public schools. *Journal of Southwest Jiaotong University, 58*(2), 1–15. https://jsju.org/index.php/journal/article/view/1580

Xu, B., & Recker, M. (2023). Adaptive learning in practice: A design-based research study of a personalized learning environment for vocational students. *British Journal of Educational Technology, 54*(1), 132–148. Focused on vocational education, this study aligns closely with your TLE context

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2020). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education, 17*(1), 1–27.

Zhu, M., van der Veen, J. T., & Admiraal, W. (2022). The effect of adaptive learning on students' learning performance and perceptions in blended learning: A meta-analysis. *Education and Information Technologies, 27*, 3841–3864.

Zimmerman, B. J. (2021). Becoming a self-regulated learner: An overview. *Theory into Practice, 41*(2), 64–70.