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Culturally responsive performance-based assessment in BARMM cookery education

Bagambang, Asmerah
MSU Marantao Community High School, Philippines (asmerah.bagambang@lccdo.edu.ph)
Diel, Alicia M.
Lourdes College, Inc., Philippines (alice.diel@lccdo.edu.ph)

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Abstract

Despite the importance of performance-based assessment in cookery education, many existing tools remain focused on written examinations and general practical activities that do not fully measure students' actual culinary competencies, cultural practices, and ethical values. This concern is more evident in the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), where local traditions, halal principles, and Maranao values are rarely reflected in assessment procedures. To address this gap, this study developed and validated a performance-based assessment tool (PBAT) for Grade 10 Technology and Livelihood Education cookery students under the Philippine K to 12 curriculum. Anchored on the ADDIE model and using a quantitative descriptive design, the study involved 30 students, 3 TLE teachers, and expert validators. Data were gathered through expert review, pilot testing, descriptive statistics, and reliability testing. Findings showed that the developed PBAT was aligned with Department of Education standards and effectively measured both technical cookery skills and socio-cultural competencies. The integration of halal practices and Maranao values such as taritib, maratabat, kapamagawid, and kapamagogopa further strengthened its cultural relevance and contextual appropriateness. The study concludes that the PBAT provides a more authentic and culturally responsive means of assessing cookery competencies. Future researchers are encouraged to validate the tool using larger samples, different regions, and other TLE specializations to strengthen its applicability and generalizability further.

Keywords: authentic assessment, cookery competencies, cultural responsiveness, culinary education, culinary practices

Culturally responsive performance-based assessment in BARMM cookery education

1. Introduction

Technology and Livelihood Education (TLE) is a core learning area in the Philippine K to 12 curricula. It equips students with practical skills in food preparation, household management, and entrepreneurship (Dowell et al., 2015). In cookery education, competence requires assessment methods that capture both theoretical knowledge and mastery of hands-on skills. Traditional written examinations, while useful for evaluating concepts, do not adequately measure complex culinary competencies such as sanitation, knife skills, and menu planning (Popham, 2020). Current educational practice highlights the importance of authentic, performance-based assessments that stimulate higher-order thinking and integrate practical skills (Biemans, 2020). Yet, many teachers in the Philippines continue to rely on traditional tests, which fail to probe mastery in practice (Ramirez, 2022). This reliance creates a gap between curricular goals and actual assessment practices.

The challenge is more pronounced in culturally diverse contexts such as the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), where culinary education must integrate halal dietary requirements and indigenous cooking traditions. Studies reveal that existing rubrics and instruments lack validation across varied educational and cultural settings, leaving Muslim communities with inadequate tools for assessing culinary competencies (Dela Cruz, 2021). Although authentic assessment is widely recognized, its systematic development and validation in Philippine cookery education remain limited. This study addresses this gap by developing and validating performance-based assessment instruments for TLE cookery. It seeks to align DepEd competencies with authentic, culturally responsive evaluation methods that measure both technical proficiency and cultural sensitivity.

Contributions of the Study - This study makes several original contributions to the field of TLE cookery assessment. First, it is among the first to systematically develop and validate a performance-based assessment tool specifically designed for Grade 10 Cookery in the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM). Unlike previous instruments that focus solely on technical competencies, this tool integrates indigenous Maranao cultural values, namely taritib (order), maratabat (honor), kapamagawid (care for shared resources), and kapamagogopa (cooperation), into the assessment rubric. Second, the study employs a rigorous multi-stage validation process involving expert review, pilot testing with students, and reliability analysis using Krippendorff's alpha, providing psychometric evidence of the tool's dependability. Third, the research bridges the gap between DepEd's national competency standards and the culturally specific needs of Muslim-majority educational settings, offering a model for contextually responsive vocational assessment that can be adapted across diverse Philippine communities.

2. Review of Related Literature and Studies

Performance-Based Assessment - Research consistently emphasizes the value of authentic and performance-based assessments in bridging theoretical learning with practical application. Villarroel (2024) explains that authentic evaluation enables students to apply academic knowledge in real-world contexts, which is crucial in skill-oriented fields such as culinary arts. Marsh (2022) adds that realistic assignments foster higher-order thinking, reduce anxiety, and increase motivation by engaging learners in problem-solving tasks. In the Philippine context, Pantaleon (2025) develops video-based instructional modules for Grade 10 cookery, which experts rate as "very satisfactory" in terms of content and delivery. Quijano (2024) examines contextualized training in seafood preparation and finds that authentic evaluation significantly improves students' skills in handling, cooking, and presenting food. These studies highlight the role of contextualized and multimedia-enhanced assessments in strengthening both academic and industry-relevant competencies.

Pedagogical Strategies and Teacher Roles - Effective TLE instruction requires teachers to possess broad

content knowledge, technical expertise, and pedagogical skills. Elarco (2023) emphasizes that teachers must not only master their specialization but also facilitate the translation of knowledge into practice. Gomez (2024) documents collaborative initiatives in developing authentic evaluation instruments, stressing the importance of teacher-stakeholder partnerships in contextualizing assessments. Steriopoulos (2022) likewise advocates pragmatic strategies that align classroom activities with industry standards while acknowledging resource limitations.

Experiential and Collaborative Learning - Recent studies highlight the value of experiential and collaborative approaches in enhancing culinary skills. Estolas (2025) introduces "Groupie Journaling," a peer-reflective technique that improves Grade 9 students' interest and performance in cookery. A study in Lipa City, based on Kolb's experiential learning theory, shows that hands-on co-creation and reflection enhance both technical and soft skills, including teamwork and problem-solving (IJMABER, 2025). Mokoka et al. (2023) emphasize the role of self-, peer-, and co-assessment in fostering metacognitive skills and student engagement, while Wahyuni et al. (2021) argue that formative, process-oriented assessments are particularly suited for evaluating complex, real-life competencies.

Local and Global Perspectives - Although literature affirms the value of authentic and performance-based assessments, several critical gaps persist in the Philippine context. First, most existing studies on cookery assessment focus on urban or lowland settings and do not account for the unique cultural, religious, and socioeconomic realities of Muslim communities in BARMM (Dela Cruz, 2021). Second, while scholars have called for culturally responsive evaluation tools, no validated instrument currently integrates Maranao cultural values into performance-based cookery assessment. Third, the existing literature lacks systematic development and validation studies that combine expert review, student pilot testing, and inter-rater reliability analysis within a single framework. Fourth, although DepEd's K to 12 TLE Cookery curriculum prescribes learning outcomes (LO1 to LO4), there is limited evidence of assessment tools that explicitly align with these outcomes while simultaneously addressing halal dietary requirements and indigenous cooking traditions. This study directly addresses these intersecting gaps by developing, validating, and recommending a culturally grounded, curriculum-aligned performance-based assessment tool for Grade 10 Cookery in BARMM.

Research Gap - Although literature affirms the value of authentic and performance-based assessments, several critical gaps persist in the Philippine context. First, most existing studies on cookery assessment focus on urban or lowland settings and do not account for the unique cultural, religious, and socioeconomic realities of Muslim communities in BARMM (Dela Cruz, 2021). Second, while scholars have called for culturally responsive evaluation tools, no validated instrument currently integrates Maranao cultural values into performance-based cookery assessment. Third, the existing literature lacks systematic development and validation studies that combine expert review, student pilot testing, and inter-rater reliability analysis within a single framework. Fourth, although DepEd's K to 12 TLE Cookery curriculum prescribes learning outcomes (LO1 to LO4), there is limited evidence of assessment tools that explicitly align with these outcomes while simultaneously addressing halal dietary requirements and indigenous cooking traditions. This study directly addresses these intersecting gaps by developing, validating, and recommending a culturally grounded, curriculum-aligned performance-based assessment tool for Grade 10 Cookery in BARMM.

Statement of the Problem - This study aims to develop and validate performance-based assessment tools to enhance students' competency in TLE cookery. Specifically, it seeks to answer the following research questions:

- What are the key cookery competencies stipulated in the K to 12 curriculum?
- What performance-based assessment tools can be developed to align with these competencies?
- How do experts evaluate the drafted cookery performance-based tools in terms of validity and cultural relevance?

- What is the reliability of the proposed performance-based tool when applied in classroom settings? and
- What performance-based assessment framework may be recommended for TLE cookery?

3. Research Method

Research Design - The study employed a quantitative research design to validate and test the reliability of the developed performance-based assessment tools in TLE cookery. A descriptive statistical approach was used to examine data gathered from expert validators and pilot testing. This design allowed the researcher to determine the psychometric characteristics of the instruments, including content, construct, and face validity, as well as reliability (Mobaraki-Asl et al., 2019). The quantitative approach provided systematic evidence of the appropriateness of the tools for evaluating student proficiency in cookery.

Participants of the Study

Table 1
Participant of the Study

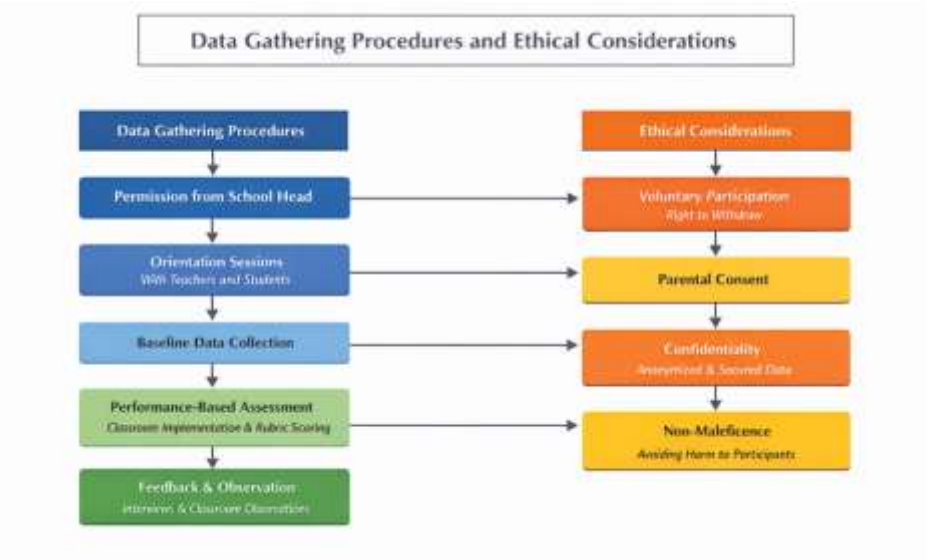
Category	Number of Participants	Role in the Study	Key Contributions
Grade 10 Students	30	Primary participants; purposively selected; aged 15–16	Engaged directly with performance-based assessment tools during pilot testing; provided feedback on usability and reliability
TLE Teachers	3	Instructors and evaluators, experts in cookery and K to 12 curriculum	Guided students during assessments; administered tools; evaluated alignment with curriculum objectives; identified challenges
External Experts	4	Validators in culinary education and curriculum development	Reviewed content, construct, and cultural relevance of tools; provided critical feedback for refinement

The participants of the study were grouped into three categories: Grade 10 students, TLE teachers, and external experts. Thirty Grade 10 students enrolled in TLE cookery served as the primary participants because they directly engaged with the performance-based assessment tools during pilot testing. They were purposively selected, aged between 15 and 16 years, and participated voluntarily with informed consent obtained from both the students and their parents or guardians. Three TLE teachers acted as instructors and evaluators. They guided students during the assessments, administered the tools in classroom settings, and provided feedback on usability, alignment with curriculum objectives, and effectiveness. Their expertise in teaching cookery and familiarity with the K to 12 curriculum ensured that their evaluations were credible and contextually relevant. Finally, four external experts in culinary education and curriculum development validated the drafted tools. They reviewed the instruments for content, construct, and cultural relevance, and their feedback was critical in refining the tools prior to pilot testing.

Research Instruments - The primary instruments were the performance-based assessment tools developed to measure competencies in cookery. These included task sheets, cooking demonstrations, and practical examinations simulating real-world scenarios. A rubric was designed to ensure objective scoring based on criteria such as accuracy, creativity, and mastery of skills. Validation of the instruments was conducted by experts and teachers to establish content, construct, and face validity. Reliability was tested through pilot implementation with students and teachers. Cronbach's alpha was used to measure internal consistency, with values of .70 or higher considered acceptable (Taber, 2018). Test–retest reliability was also examined to determine consistency of results across repeated tasks.

Data Gathering Procedures and Ethical Considerations - Ethical compliance was ensured throughout all phases of the study. Prior to data collection, ethical clearance was obtained from the institutional review body. Full written informed consent was secured from all participants. For the thirty Grade 10 students (aged 15 to 16), parental or guardian consent was obtained in accordance with DepEd policies on the protection of children involved in research. Students themselves provided written assent after being fully briefed on the study's purpose, procedures, potential risks, and their right to withdraw at any time without academic penalty. The three TLE teacher-participants and four external expert validators each signed informed consent forms detailing the scope of

their involvement, confidentiality protections, and voluntary nature of participation. Confidentiality was maintained by anonymizing all participants' names and securing data in password-protected storage accessible only to the researcher. The principle of non-maleficence was strictly observed: no participant was subjected to harm, undue pressure, or coercion. All data were used exclusively for academic purposes and reported truthfully and objectively. Participants were assured that their involvement or non-involvement would have no bearing on their grades, employment status, or professional standing.



The data gathering procedures followed a systematic sequence to ensure accuracy and credibility. First, permission to conduct the study was secured from the school head. Orientation sessions were then conducted with teachers and students to explain the purpose, scope, and procedures of the research. Baseline data on student competencies were collected prior to the use of the tools. The performance-based assessments were subsequently implemented in actual classroom settings, where students completed tasks designed to measure cookery competencies. Rubrics were applied to score performance objectively, and teachers provided structured feedback through interviews and classroom observations, documenting student engagement, instructional flow, and challenges.

Ethical considerations were strictly observed throughout the study. Participation was voluntary, and students were informed of their right to withdraw at any time without penalty. Parental consent was obtained to ensure transparency and accountability. Confidentiality was maintained by anonymizing names and securing data in password-protected storage. The researcher adhered to the principle of non-maleficence by avoiding harm or undue pressure on participants. Finally, all data were used exclusively for academic purposes and reported truthfully and objectively.

Statistical Treatment of Data

Table 2

Summary of Statistical Methods Used in the Study

Statistical Method	Purpose	Expected Outcome
Cronbach's Alpha	To measure internal consistency of rubric items	$\alpha \geq .70$ indicates acceptable reliability (Taber, 2018)
Test–Retest Reliability	To assess stability of results across repeated tasks	Consistent scores across time confirm tool reliability
Cohen's Kappa / % Agreement	To evaluate inter-rater reliability among multiple evaluators	High agreement indicates objective and consistent scoring
Descriptive Statistics	To summarize student performance before and after intervention	Mean, SD, frequency, and percentage reveal trends in competency development
Expert Validation	To establish content, construct, and face validity	Expert feedback confirms alignment with curriculum and cultural relevance
Software Analysis (Jamovi)	To support statistical computations and data interpretation	Ensures accuracy and transparency in data analysis

The study employed a combination of descriptive and inferential statistical methods to ensure the validity and reliability of the developed performance-based assessment tools in TLE cookery. Cronbach's alpha was computed to measure internal consistency among rubric items. A value of .70 or higher was considered acceptable, indicating that the items consistently measured the same construct (Taber, 2018). Test–retest reliability was examined to determine the stability of results across repeated tasks. Consistent scores over time confirmed that the tools produced dependable outcomes. Inter-rater reliability was assessed using Cohen's kappa and percentage agreement, which measured the consistency of scores assigned by multiple evaluators. High agreement values indicated that the rubric provided objective and standardized scoring criteria. Descriptive statistics, including mean, standard deviation, frequency, and percentage, were applied to summarize student performance before and after the implementation of the tools. These measures identified trends in competency development and provided a clear picture of student improvement. Validity was established through expert review, ensuring that the tools aligned with curriculum standards and cultural contexts. Statistical software such as Jamovi was used to support computations and enhance accuracy in data analysis. Collectively, these statistical treatments provided robust evidence that the performance-based assessment tools were psychometrically sound, reliable, and effective in measuring and enhancing student competencies in TLE cookery.

4. Results and Discussion

The findings of the study in line with the research questions. Results are reported objectively, using tables to highlight key data without redundancy.

4.1 Key Cookery Competencies in Grade 10 TLE

The findings confirmed that the BARMM Cookery curriculum adhered to the Department of Education (DepEd) standards while contextualizing lessons to reflect cultural realities. This ensured consistency in competencies, learning outcomes, and assessment practices while adapting instruction to the cultural, social, and economic contexts of Bangsamoro learners (DepEd, 2020). The Grade 10 TLE Cookery curriculum included five core competencies: tool use, maintenance of tools and equipment, mensuration and calculation, occupational health and safety practices (OHSP), and food quality (taste, texture, appearance, and doneness). These competencies were validated as essential elements of cookery education and aligned with national standards.

Table 3
Key Cookery Competencies in Grade 10 TLE

Competency	Description
Use of tools, equipment, and paraphernalia	Correct and safe handling of kitchen implements
Maintenance of tools and equipment	Cleaning, drying, and proper storage
Mensuration and calculation	Accurate measurement and conversion of ingredients
OHSP compliance	Adherence to hygiene, sanitation, and safety protocols
Food quality	Evaluation of taste, texture, appearance, and doneness of prepared dishes

The identified competencies—tool use, maintenance, mensuration, OHSP compliance, and food quality—demonstrated both technical proficiency and procedural knowledge, consistent with Villarreal (2024), who argued that performance-based tasks strengthen higher-order thinking and skill application. The contextualization of competencies in BARMM further highlighted the importance of cultural responsiveness in vocational education. Dela Cruz (2021) noted that cookery education in Muslim-majority regions must incorporate halal practices and indigenous traditions to achieve inclusivity, and the findings affirmed that localized adaptations enhanced learner engagement and relevance, aligning with Quijano (2024), who reported that contextualized training improved performance and cultural appreciation.

The inclusion of food quality criteria—taste, texture, appearance, and doneness—showed that assessment extended beyond procedural correctness to the quality of the final product. This reflects the multidimensional nature of cookery education, where technical execution intersects with creativity and cultural identity. Pantaleon (2025) similarly found that multimedia-enhanced cookery assessments improved both technical and aesthetic competencies. Synthesizing these results, the study contributes to the literature by presenting a framework that

balances national competency standards with cultural contextualization. It demonstrates that authentic assessment in cookery education can measure technical mastery while reinforcing cultural identity and values. This dual alignment strengthens pedagogical relevance and inclusivity, addressing the gap identified by Ramirez (2022), who observed that traditional tests often fail to capture practical mastery in Philippine classrooms.

4.2 Performance-based assessment tool (PBAT)

The Cookery curriculum implemented in the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) was fully aligned with the Department of Education (DepEd) mandated curriculum. BARMM adopted the national standards set by DepEd, ensuring consistency in competencies, learning outcomes, and assessment practices.

Table 4
Grade 10 Cookery Performance Task Tool

Criteria	5 – Exemplary	4 – Proficient	3 – Developing	2 – Beginning	Score
1. Use of Tools, Equipment, and Paraphernalia (K to 12 TLE Cookery LO1)	Uses correct tools and equipment with precision, confidence, and full safety awareness.	Uses tools and equipment correctly with minimal support.	Inconsistent or hesitant use of tools; occasional misuse.	Incorrect, unsafe, or inappropriate use of tools.	
2. Maintenance of Tools and Equipment (K to 12 TLE Cookery LO2)	Cleans, dries, and stores all tools and equipment thoroughly; checks for issues.	Cleans and stores tools properly but misses some steps.	Partial or rushed cleaning and storage.	Leaves tools dirty or poorly maintained.	
3. Mensuration and Calculation (K to 12 TLE Cookery LO3)	All ingredients measured accurately; conversions applied correctly.	Most ingredients measured accurately; minor errors in calculation.	Some measurements inaccurate; needs guidance with conversions.	Lacks understanding of measurement and conversion.	
4. OHSP Compliance (K to 12 TLE Cookery LO4)	Strictly follows kitchen safety protocols, hygiene, PPE use, and sanitation.	Mostly follows safety and hygiene procedures with minimal reminders.	Inconsistent compliance with OHSP; needs frequent reminders.	Frequently disregards safety and hygiene protocols.	
5a. Food Quality: Taste	Well-balanced seasoning; enhances natural flavors of ingredients.	Adequate seasoning; flavors are acceptable.	Lacks flavor balance; either bland or over seasoned.	Poor taste; unappetizing or unpleasant flavor.	
5b. Food Quality: Texture	Excellent texture; vegetables crisp-tender and not over/undercooked.	Mostly good texture; minor inconsistencies in doneness.	Some ingredients over- or undercooked; inconsistent texture.	Very poor texture; mushy or raw vegetables.	
5c. Food Quality: Appearance/Presentation	Neatly plated; vibrant color retained; very appetizing presentation.	Visually acceptable with slight imperfections.	Messy or dull plating; lacks visual appeal.	Poor plating; unappealing appearance.	
5d. Food Quality: Doneness	All ingredients perfectly cooked to desired doneness.	Most ingredients cooked well with few exceptions.	Several ingredients improperly cooked.	Majority undercooked or overcooked.	
6. Time Management	Task completed within time frame without rushing; efficient workflow.	Finished on time with minor delays.	Time poorly managed; required extra time or rushed finish.	Significantly late or failed to complete task.	
7. Teamwork	Excellent collaboration; roles clearly divided and all contributed equally.	Good collaboration; most contributed fairly.	Uneven effort among members; roles unclear.	Poor teamwork; minimal collaboration or conflicts observed.	

The results affirmed that the competencies embedded in the Grade 10 Cookery Performance Task Tool were aligned with the prescribed learning outcomes of the K to 12 TLE Cookery curriculum. The tool integrated technical proficiency, procedural knowledge, and work-related values essential to culinary practice, reflecting the multidimensional nature of cookery education. Core competencies such as tool use (LO1), maintenance of equipment (LO2), mensuration and calculation (LO3), and OHSP compliance (LO4) emphasized precision, sanitation, and safety awareness. These findings support Popham (2020), who stressed that authentic assessment must align with curricular outcomes, and Villarreal (2024), who highlighted the role of performance-based tasks in strengthening higher-order thinking and skill application.

Beyond process-oriented skills, the assessment incorporated food quality indicators — taste, texture,

presentation, and doneness—demonstrating that culinary proficiency was measured not only through procedural correctness but also through the quality of the final product. The inclusion of time management and teamwork further emphasized efficiency, collaboration, and accountability, aligning with broader educational goals. This is consistent with Dela Cruz (2021), who underscored the importance of integrating halal practices and indigenous traditions in Muslim-majority regions, and Quijano (2024), who found that contextualized training enhanced both performance and cultural appreciation. Similarly, Pantaleon (2025) reported that multimedia-enhanced cookery assessments improved technical and aesthetic competencies, reinforcing the value of multidimensional and culturally responsive evaluation in vocational education.

4.3 Experts' reviews on the drafted cookery performance-based tools

The table below presents the expert reviews of the drafted Cookery Performance-Based Assessment Tool, highlighting their observations and culturally grounded recommendations on its alignment with cookery competencies and its integration of Maranao values such as taritib, maratabat, paggalang, and kapamagogopa in assessing learners' performance.

Table 5
Consolidated Experts Review and Recommendations

Expert	Observation	Recommendation
1	I observed that the draft tool focuses mainly on technical cookery competencies and lacks contextualization. Some descriptors in the first draft are general and may be interpreted differently by assessors. This is reflected in the MELC as stipulated in the BARMM but the daft forgot the integration of the Maranao tradition.	Recommended integrating indigenous or local cultural values to make assessment more meaningful Be more explicit behavioral indicators to align in the Muslim cultural cookery perspective. Localize the values of respect, cooperation, and shared responsibility. Contextualize the use of the tool in terms of the food/s that the student will demonstrate in the class.
2	There is a strong alignment of the scaling from basic competencies to complex. Do not use terms that are not applicable in the Maranao culture. There is no contextualisation in the authenticity to increase learner engagement. Competencies are practical and responsive to real kitchen and community practices.	Embed communal responsibility and respect within technical criteria, supporting holistic assessment if needed to enhance the cultural context. The tool should reflect authentic communal cooking values and shared responsibility. Highlight balance of skill and maratabat (honor) in all tasks.
3	Strengthen the affective outcomes related to pride and cultural identity. The performance indicators should reflect learners' social and communal practices to enhance relevance. Actual kailangan	The tool should integrate Maranao values related to discipline, honor, and cooperation within performance indicators. Incorporates Maranao values such as taritib, maratabat, kapamagawid, and kapamagogopa within the different performance levels, thereby ensuring that the assessment tool is culturally contextualized.
1	I observed that the draft tool focuses mainly on technical cookery competencies and lacks contextualization. Some descriptors in the first draft are general and may be interpreted differently by assessors. This is reflected in the MELC as stipulated in the BARMM but the daft forgot the integration of the Maranao tradition.	Recommended integrating indigenous or local cultural values to make assessment more meaningful Be more explicit behavioral indicators to align in the Muslim cultural cookery perspective. Localize the values of respect, cooperation, and shared responsibility. Contextualize the use of the tool in terms of the food/s that the student will demonstrate in the class.
2	There is a strong alignment of the scaling from basic competencies to complex. Do not use terms that are not applicable in the Maranao culture. There is no contextualisation in the authenticity to increase learner engagement. Competencies are practical and responsive to real kitchen and community practices.	Embed communal responsibility and respect within technical criteria, supporting holistic assessment if needed to enhance the cultural context. The tool should reflect authentic communal cooking values and shared responsibility. Highlight balance of skill and *maratabat* (honor) in all tasks.
3	Strengthen the affective outcomes related to pride and cultural identity. The performance indicators should reflect learners' social and communal practices to enhance relevance.	The tool should integrate Maranao values related to discipline, honor, and cooperation within performance indicators. Incorporates Maranao values such as *taritib*, *maratabat*, *kapamagawid*, and *kapamagogopa* within the different performance levels, thereby ensuring that the assessment tool is culturally contextualized.

The panel of experts agreed that the initial draft of the Cookery Performance-Based Assessment Tool

effectively captured technical cookery skills and presented competencies in a logical sequence. However, they noted that the tool leaned heavily on technical aspects and lacked sufficient cultural contextualization, particularly the rich traditions of the Maranao people. Some descriptors were considered overly broad, creating ambiguity for teachers during evaluation. The absence of values such as cultural pride, cooperation, and shared responsibility was also highlighted as a limitation, reflecting the need for assessment tools to address both technical and socio-cultural dimensions of learning (Popham, 2020; Villarreal, 2024).

To address these gaps, the experts recommended integrating Maranao cultural values, including taritib (order), maratabat (honor), kapamagawid (care for shared resources), and kapamagogopa (cooperation). They emphasized that cookery education should transcend technical mastery by fostering respect, collaboration, and cultural identity. Recommendations included refining descriptors for clarity, incorporating real-life cooking scenarios, and using familiar local dishes to enhance relevance. These insights align with Dela Cruz (2021), who stressed the importance of embedding halal practices and indigenous traditions in Muslim-majority regions, and Quijano (2024), who found that contextualized training improved both performance and cultural appreciation. Collectively, the experts' feedback affirmed the need to harmonize technical competence with cultural relevance, ensuring that the revised tool became not only a measure of culinary skill but also a reflection of learners' values and collective identity in the BARMM context.

Table 6
Revised Performance based assessment Tool

Criteria	5 – Exemplary	4 – Proficient	3 – Developing	2 – Beginning	Score
1. Use of Tools, Equipment, and Paraphernalia (K to 12 TLE Cookery LO1)	Uses correct tools and equipment with precision, confidence, and full safety awareness, demonstrating *paggalang* (respect) for communal resources and *taritib* (orderliness), reflecting Maranao values of discipline and responsibility	Uses tools and equipment correctly with minimal support, showing awareness of safety and respect for shared materials.	Inconsistent or hesitant use of tools; occasional misuse, with limited demonstration of communal accountability.	Incorrect, unsafe, or inappropriate use of tools, disregarding safety and communal respect.	
2. Maintenance of Tools and Equipment (K to 12 TLE Cookery LO2)	Cleans, dries, and stores all tools and equipment thoroughly; checks for issues, embodying *kapamagawid* (care for shared property) and *maratabat* (honor) by ensuring resources remain useful for the community.	Cleans and stores tools properly but misses some steps, showing partial responsibility.	Partial or rushed cleaning and storage, reflecting limited commitment to communal upkeep.	Leaves tools dirty or poorly maintained, neglecting cultural values of accountability and respect.	
3. Mensuration and Calculation (K to 12 TLE Cookery LO3)	Measures all ingredients accurately, reflecting *taritib* (order) and *kapamagogopa* (cooperation), ensuring fairness and precision in shared tasks.	Most ingredients measured accurately, showing awareness of order and fairness.	Some measurements inaccurate; needs guidance to align with structured expectations	Lacks understanding of measurement and conversion.	
4. OHSP Compliance (K to 12 TLE Cookery LO4)	Strictly follows kitchen safety protocols, hygiene, PPE use, and sanitation, demonstrating *taritib* (orderliness) and *maratabat* (honor) by respecting communal safety and ensuring harmony in shared spaces	Mostly follows safety and hygiene procedures with minimal reminders.	Inconsistent compliance with OHSP; needs frequent reminders.	Frequently disregards safety and hygiene protocols.	
5a. Food Quality: Taste	Well-balanced seasoning; enhances natural flavors of ingredients, reflecting *kapamagogopa* (cooperation) and respect for traditional Maranao culinary practices.	Adequate seasoning; flavors are acceptable.	Lacks flavor balance; either bland or overseasoned.	Poor taste; unappetizing or unpleasant flavor.	
5b. Food Quality: Texture	Excellent texture; vegetables crisp-tender and not over/undercooked, reflecting *taritib* (order) and attentiveness valued in Maranao cooking	Mostly good texture; minor inconsistencies in doneness.	Some ingredients over- or undercooked; inconsistent texture.	Very poor texture; mushy or raw vegetables.	

5c. Food Quality: Appearance/Presentation	Neatly plated; vibrant color retained; very appetizing presentation, reflecting *maratabat* (honor) and pride in communal sharing	Visually acceptable with slight imperfections.	Messy or dull plating; lacks visual appeal.	Poor plating; unappealing appearance.
5d. Food Quality: Doneness	All ingredients perfectly cooked to desired doneness, reflecting discipline and attentiveness.	Most ingredients cooked well with few exceptions.	Several ingredients improperly cooked.	Majority undercooked or overcooked.
6. Time Management	Task completed within time frame without rushing; efficient workflow.	Finished on time with minor delays.	Time poorly managed; required extra time or rushed finish.	Significantly late or failed to complete task.
7. Teamwork	Excellent collaboration; roles clearly divided and all contributed equally.	Good collaboration; most contributed fairly.	Uneven effort among members; roles unclear.	Poor teamwork; minimal collaboration or conflicts observed.

4.4 Reliability of the proposed performance-based assessment tool

The reliability of the proposed performance-based assessment tool was examined using Krippendorff's alpha (α) to measure consistency among raters. Table 5 presented the inter-rater reliability across multiple performance criteria in the K to 12 TLE Cookery context. The results showed generally high to very high levels of agreement across most competencies, indicating that the tool provided a dependable framework for evaluating student performance. The inclusion of standard error (SE) and confidence intervals (CI) further strengthened the findings by demonstrating both the stability and precision of the ratings. These statistical measures confirmed that the assessment tool produced consistent results across evaluators, supporting its reliability as an instrument for measuring cookery competencies in classroom settings.

Table 7
Inter-Rater Agreement Across Performance Criteria Using Krippendorff's Alpha

Criteria	Krippendorff's alpha	SE	95% CI	
			Lower	Upper
Use of Tools, Equipment, and Paraphernalia (K to 12 TLE Cookery LO1)	0.955	0.048	0.842	1.000
Maintenance of Tools and Equipment (K to 12 TLE Cookery LO2)	0.822	0.088	0.642	0.956
Mensuration and Calculation (K to 12 TLE Cookery LO3)	0.899	0.075	0.727	1.000
OHSP Compliance (K to 12 TLE Cookery LO4)	1.000	0.000	1.000	1.000
Food Quality: Taste	0.846	0.294	-0.017	1.000
Food Quality: Texture	0.846	0.275	-0.017	1.000
Food Quality: Appearance/Presentation	1.000	0.000	1.000	1.000
Food Quality: Doneness	1.000	0.000	1.000	1.000
Time Management	0.890	0.079	0.712	1.000
Teamwork	0.888	0.165	0.553	1.000

Note: Krippendorff's alpha (α) was used to determine the degree of agreement among three raters evaluating 30 students using an ordinal rating scale. The table reports the alpha coefficient, standard error (SE), and 95% confidence interval (CI) for each criterion. Alpha values closer to 1.00 indicate stronger inter-rater agreement, while lower values indicate weaker agreement.

The highest levels of agreement were recorded in competencies that were procedural and highly observable, such as Use of Tools, Equipment, and Paraphernalia (LO1, α = 0.955), OHSP Compliance (LO4, α = 1.000), and both Appearance/Presentation and Doneness (α = 1.000). These results indicated that raters evaluated these skills with minimal ambiguity, as they were anchored in standardized practices and visible outcomes. Proper tool usage, adherence to safety protocols, and the visual inspection of presentation and doneness were consistently assessed, reflecting the clarity of rubric descriptors and the objectivity of criteria. Strong agreement was also evident in Mensuration and Calculation (LO3, α = 0.899) and Time Management (α = 0.890), suggesting that raters shared a common understanding of measurable outcomes such as accuracy and efficiency. By contrast, Maintenance of Tools and Equipment (LO2, α = 0.822) showed slightly lower agreement, which may have been due to differences in how raters interpreted thoroughness in cleaning and storage.

More variability was observed in competencies involving subjective judgment. Taste and Texture (α = 0.846)

demonstrated acceptable agreement but had wider confidence intervals and higher standard errors, reflecting the inherent subjectivity of sensory evaluation. Teamwork ($\alpha = 0.888$) also showed strong but variable agreement, likely due to differences in how raters valued participation, leadership, and cooperation. These findings demonstrated that the tool was highly reliable in evaluating competencies that were objective, procedural, and visually observable, while those involving sensory or interpersonal dimensions required clearer descriptors and rater calibration. This pattern highlighted the importance of specificity in rubric design, consistent with Taber (2018), who emphasized that reliability improves when performance indicators are concrete and observable.

4.5 Cookery Performance-based tool Recommended

Based on expert validation, reliability analysis, and subsequent revisions, the Revised Performance-Based Cookery Assessment Rubric was recommended as the appropriate instrument for assessing student competencies in TLE Cookery. The findings confirmed that the tool was valid, reliable, and aligned with the instructional objectives of the K to 12 TLE Cookery curriculum. Its endorsement was supported by empirical evidence showing that the rubric provided consistent and dependable measures of performance across technical and procedural domains (Popham, 2020; Taber, 2018). The recommended rubric was criterion-referenced and analytic, featuring explicitly defined performance criteria that covered essential aspects of culinary instruction. These included the use and maintenance of tools and equipment, measurement and calculation, adherence to occupational health and safety standards, food quality (taste, texture, appearance, and doneness), time management, and teamwork. Each criterion was organized into four performance levels—Exemplary, Proficient, Developing, and Beginning—ensuring systematic and transparent assessment of student performance in practical cooking activities. The clarity and structure of the rubric supported its usability for both teachers and learners, consistent with Villarreal (2024), who emphasized that performance-based tasks strengthen higher-order thinking and skill application.

Table 8

Recommended Performance-Based Assessment Tool for Halal Cookery

Criteria	5 – Exemplary	4 – Proficient	3 – Developing	2 – Beginning	Score
1. Use of Tools, Equipment, and Paraphernalia (K to 12 TLE Cookery LO1)	Uses correct tools and equipment with precision, confidence, and full safety awareness, demonstrating *paggalang* (respect) for communal resources and *taritib* (orderliness), reflecting Maranao values of discipline and responsibility	Uses tools and equipment correctly with minimal support, showing awareness of safety and respect for shared materials.	Inconsistent or hesitant use of tools; occasional misuse, with limited demonstration of communal accountability.	Incorrect, unsafe, or inappropriate use of tools, disregarding safety and communal respect.	
2. Maintenance of Tools and Equipment (K to 12 TLE Cookery LO2)	Cleans, dries, and stores all tools and equipment thoroughly; checks for issues, embodying *kapamagawid* (care for shared property) and *maratabat* (honor) by ensuring resources remain useful for the community.	Cleans and stores tools properly but misses some steps, showing partial responsibility.	Partial or rushed cleaning and storage, reflecting limited commitment to communal upkeep.	Leaves tools dirty or poorly maintained, neglecting cultural values of accountability and respect.	
3. Mensuration and Calculation (K to 12 TLE Cookery LO3)	Measures all ingredients accurately, reflecting *taritib* (order) and *kapamagogopa* (cooperation), ensuring airness and precision in shared tasks.	Most ingredients measured accurately, showing awareness of order and fairness.	Some measurements inaccurate; needs guidance to align with structured expectations	Lacks understanding of measurement and conversion.	
4. OHSP Compliance (K to 12 TLE Cookery LO4)	Strictly follows kitchen safety protocols, hygiene, PPE use, and sanitation, demonstrating *taritib* (orderliness) and *maratabat* (honor) by respecting communal safety and ensuring harmony in shared spaces.	Mostly follows safety and hygiene procedures with minimal reminders.	Inconsistent compliance with OHSP; needs frequent reminders.	Frequently disregards safety and hygiene protocols.	

5a. Food Quality: Taste	Well-balanced seasoning; enhances natural flavors of ingredients, reflecting *kapamagogopa* (cooperation) and respect for traditional Maranao culinary practices.	Adequate seasoning; flavors are acceptable.	Lacks flavor balance; either bland or overseasoned.	Poor taste; unappetizing or unpleasant flavor.
5b. Food Quality: Texture	Excellent texture; vegetables crisp-tender and not over/undercooked, reflecting *taritib* (order) and attentiveness valued in Maranao cooking	Mostly good texture; minor inconsistencies in doneness.	Some ingredients over- or undercooked; inconsistent texture.	Very poor texture; mushy or raw vegetables.
5c. Food Quality: Appearance/Presentation	Neatly plated; vibrant color retained; very appetizing presentation, reflecting *maratabat* (honor) and pride in communal sharing	Visually acceptable with slight imperfections.	Messy or dull plating; lacks visual appeal.	Poor plating; unappealing appearance.
5d. Food Quality: Doneness	All ingredients perfectly cooked to desired doneness, reflecting discipline and attentiveness.	Most ingredients cooked well with few exceptions.	Several ingredients improperly cooked.	Majority undercooked or overcooked.
6. Time Management	Task completed within a time frame without rushing; efficient workflow.	Finished on time with minor delays.	Time poorly managed; required extra time or rushed finish.	Significantly late or failed to complete task.
7. Teamwork	Excellent collaboration; roles clearly divided and all contributed equally.	Good collaboration; most contributed fairly.	Uneven effort among members; roles unclear.	Poor teamwork; minimal collaboration or conflicts observed.

The recommended Performance-Based Assessment Tool for Halal Cookery was evaluated and found to be acceptable to highly acceptable across criteria. Expert reviewers reported elevated mean scores and minimal inter-rater variability, indicating that the descriptors were clear, relevant, and consistently interpreted. Reliability analysis further demonstrated acceptable to good internal consistency, confirming that the tool provided dependable measurement of students' culinary competencies (Taber, 2018; Popham, 2020). The tool facilitated effective teaching and learning by explicitly communicating performance objectives to students. Its enhanced descriptors allowed educators to align demonstrations, guided practice, and feedback with assessment criteria, thereby supporting skill acquisition and reflective learning. The rubric emphasized observable actions and outcomes, enabling learners to identify strengths and areas for improvement, which is essential in performance-based contexts (Villarreal, 2024). Moreover, the tool was suitable within the framework of Islamic food preparation, as multiple criteria reinforced principles of cleanliness, safety, discipline, and accountability. This alignment promoted the internalization of sanitation, tool maintenance, and ethical practices, consistent with Bugeja (2025), who highlighted the role of culturally grounded rubrics in fostering professional and respectful culinary practice.

5. Conclusions

This study concluded that the absence of validated performance-based assessment tools in TLE Cookery required the creation of a curriculum-aligned and culturally responsive instrument. The analytic rubric developed in this research successfully translated Grade 10 cookery competencies into measurable indicators of both process and product performance. Expert validation confirmed its clarity and alignment with curriculum standards, while reliability testing demonstrated high inter-rater consistency, affirming its psychometric soundness. The integration of Maranao values further enhanced its contextual relevance, making the tool particularly suitable for BARMM and Muslim educational settings. Overall, the findings established that performance-based assessment, when systematically designed and validated, provides a more authentic, fair, and meaningful evaluation of cookery competencies compared to traditional methods.

Practical Educational Implications - The findings of this study carry meaningful practical implications for classroom instruction, curriculum design, and educational policy in TLE cookery education.

- For classroom practice, the validated Performance-Based Assessment Tool provides teachers with a structured, transparent rubric that can be used for both formative and summative assessment. Unlike traditional written examinations, the tool requires students to demonstrate competencies in real-time cooking tasks, enabling teachers to evaluate not only what students know but what they can do. The rubric's explicit descriptors for each performance level (Exemplary, Proficient, Developing, Beginning) offer teachers a concrete framework for providing targeted feedback, reducing subjectivity in grading, and ensuring that assessment criteria are communicated clearly to students before activities begin.

- For curriculum alignment, the study demonstrates how DepEd's mandated learning outcomes (LO1 to LO4) can be operationalized through authentic assessment. Teachers and curriculum coordinators can use the validated tool as a blueprint for designing learning activities that integrate technical skill development with cultural values education. The explicit linkage between rubric criteria and the K to 12 TLE Cookery competencies ensures that assessment drives instruction rather than existing as a separate, disconnected exercise.

- For culturally responsive education, particularly in BARMM and Muslim-majority regions, the integration of Maranao values (taritib, maratabat, kapamagawid, kapamagogopa) into the assessment rubric illustrates how culturally grounded evaluation can enhance learner engagement and relevance. Teachers in diverse cultural settings can adapt this approach by identifying and embedding their own community values into assessment criteria, thereby making evaluation more meaningful and inclusive.

- For school-level implementation, the tool's demonstrated reliability (Krippendorff's alpha ranging from 0.822 to 1.000) gives school administrators confidence that the rubric produces consistent results across different raters. This supports its adoption as a standard assessment instrument within school-based cookery programs, enabling more fair and equitable evaluation of student performance.

Significance of Findings for Key Stakeholders - The findings of this study hold distinct significance for each stakeholder group in TLE cookery education.

- For practitioners and teachers, the validated rubric offers an evidence-based, ready-to-use instrument that strengthens the objectivity and authenticity of cookery assessment. Teachers gain a structured framework that replaces ad hoc scoring with systematic, criteria-referenced evaluation. The rubric's clear performance descriptors reduce inter-rater variability, ensuring that students are assessed consistently regardless of who evaluates them. Furthermore, the tool's cultural integration equips teachers in BARMM and similar contexts with an assessment model that honors students' cultural identity while maintaining academic rigor.

- For students, the performance-based tool transforms assessment from a passive, written exercise into an active, hands-on demonstration of competency. Students benefit from transparent criteria that communicate expectations before the task, enabling self-assessment and reflective learning. The rubric's emphasis on observable actions and outcomes empowers students to identify their strengths and areas for improvement, fostering metacognitive skills and a growth mindset. The integration of cultural values reinforces students' sense of identity and belonging, making learning more personally meaningful.

- For schools and administrators, the study provides a replicable model for developing and validating assessment tools in technical-vocational subjects. Schools can adopt the validated rubric to standardize cookery assessment across sections and grade levels, ensuring fairness and comparability. The study also highlights the importance of investing in teacher training on performance-based assessment, as the tool's effectiveness depends on teachers' capacity to apply it consistently. Administrators can use these findings to justify resource allocation for professional development programs focused on authentic assessment practices.

- For DepEd and policymakers, the study demonstrates that national curriculum standards can be effectively contextualized without compromising rigor. The validated tool offers a prototype for developing culturally responsive assessment instruments in other TLE specializations and regions, supporting DepEd's mandate for inclusive, relevant, and quality education.

Recommendations - In light of these conclusions, it is recommended that TLE teachers adopt the validated rubric to strengthen objectivity, transparency, and authenticity in classroom assessment, using it for both formative and summative purposes to support feedback and reflective learning. School administrators are encouraged to provide professional development programs on performance-based assessment to ensure consistent and reliable evaluation practices. Curriculum developers and policymakers may integrate validated exemplars into the national TLE Cookery curriculum while allowing contextual adaptation for diverse learning environments. For BARMM and Muslim institutions, culturally responsive assessment tools should be prioritized to ensure inclusivity and ethical evaluation. Finally, future researchers are advised to replicate and extend this study to other TLE specializations and educational contexts, thereby broadening the evidence base and exploring long-term impacts of performance-based assessment in technical-vocational education.

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