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Issues and Challenges in the Implementation of a Structure of the Observed Learning Outcomes (SOLO)-Based Formative Assessment in the Division of Northern Samar

Chando S. Pialago*
Master Teacher I, Silvino Lubos Vocational High School, Department of Education, Division of Northern Samar, Silvino Lubos, Philippines

Abstract—This study explored the issues and challenges in the implementation of structured of the observed learning outcomes (SOLO) formative assessments among secondary schools in the Division of Northern Samar. Using qualitative research design, interviews and classroom observations were conducted among teachers who were purposively sampled from the 3 areas of the division namely pacific, central, and balicuatro to unearthing their experiences in the conduct of SOLO-based formative assessments. The saturated noteworthy statements in the thematic analysis formed global themes which are instructional constraints in assessment implementation, learner readiness and comprehension gaps, and alignment and resource limitations. It was concluded that challenges in implementing SOLO-based assessments stem from systemic barriers like time constraints, limited resources, and insufficient training. Teachers are willing but struggle with feasibility, especially in designing higher-level tasks. Sustained capacity-building is essential for successful implementation. With this, school heads may strengthen support by allowing more time for assessment planning, reducing teacher workload, and providing relevant materials. Teachers also need training in language-sensitive assessment to create accessible, cognitively rigorous tasks.

***Index Terms*—Structured of the Observed Learning Outcomes (SOLO), formative assessment, issues, challenges.**

1. Introduction

The development of students' higher-order thinking skills (HOTS) is essential in mathematics classroom instruction. As Wheary and Ennis (1995) emphasized, cultivating HOTS is an inherent responsibility in mathematics education, as it provides critical feedback about students' levels of thinking and encourages them to reason more effectively. Through studies on how to teach HOTS, teachers gain valuable insights into how far educational goals have been achieved.

However, despite its recognized importance, both global and national assessments reveal persistent challenges in HOTS development among students. According to the Department of Education – National Report of the Philippines (2019), the country ranked second to the lowest among participating nations in the 2018 Programme for International Student Assessment (PISA). Filipino students scored an average of 353 in Mathematical Literacy, significantly below the OECD average of 489. This alarming trend is echoed in more recent data from the 2023 National Achievement Test (NAT), which shows that many Grade 10 students across regions continue to fall short of expected proficiency. In Region VIII, the Division of Northern Samar ranked the lowest, highlighting a critical need for intervention. Supplementary assessments, such as the Regional Unified Numeracy Test (RUNT) and quarterly mathematics examinations for School Year 2023–2024, further confirm that most students performed significantly below the 75% proficiency benchmark.

Several studies have also documented the specific issues and challenges teachers face in implementing HOTS-oriented instruction and assessment. Sa'dijah and Susiswo (2022) reported that students remained passive even when the scientific method was used, and that HOTS-based learning consumed significant instructional time. Teachers found it difficult to construct HOTS-based assessments due to the extensive thinking and preparation required. Furthermore, students struggled with HOTS questions because of their low reading interest and varying ability levels. Similarly, Abu Bakar and Hamid (2019) observed that teachers needed time not only to nurture students' thinking skills but also to enhance their own. Hidayat and Lestari (2022) identified additional issues such as limited teacher capacity in designing HOTS-based materials, and students' dependence on teacher guidance instead of independent thinking.

The study was conducted in the Division of Northern Samar, located in the Eastern Visayas region of the Philippines. This division is composed of three geographically distinct areas—Balicuatro, Central, and Pacific—each characterized by unique socio-economic and cultural factors that impact education and resource distribution. Utilizing a qualitative research design, the study involved ten (10) secondary mathematics teachers as respondents among the participating schools spread out from the different distinct areas from purposively selected schools across the three areas, who served as the respondents.

*Corresponding author: chando.pialago@deped.gov.ph

Interviews and classroom observations were conducted to gather the necessary data.

Given this context, the significance of the current study lies in its focus on identifying the challenges and issues in the implementation of SOLO-based assessment as a strategy to enhance HOTS in mathematics learning. By examining the barriers to effective application of this framework, particularly in the Division of Northern Samar and similarly situated areas, the study aims to propose practical, research-informed solutions. This effort aligns with the Department of Education's thrust to strengthen formative assessment, improve instructional quality, and ultimately raise student achievement in mathematics.

2. Findings

A. Instructional Constraints in Assessment Implementation

This theme highlights the systemic and pedagogical barriers that limit teachers' effective use of formative assessment in mathematics classrooms, particularly in the Division of Northern Samar. Two main challenges emerged: time constraints in large or varied classes (n=4) and limited flexibility in assessment formats (n=2).

Teachers repeatedly cited limited class time as a major hurdle. As Informant 8 shared, conducting meaningful assessment in a one-hour session with a large class was difficult. Others echoed the same issue with brief remarks like "Time constraint" and "Usually talaga sir time constraint." This confirms with the findings of Black and Wiliam (2009) who note that the effectiveness of formative assessment is significantly reduced when instructional time is insufficient for in-depth feedback and student reflection.

Classroom observations confirmed this pattern. Teachers often relied on brief, end-of-class quizzes—some of which were self-checked—to manage time constraints. While this method offered immediate feedback, it lacked the depth required to meaningfully inform instruction. For instance, one teacher administered a five-item quiz to over 40 students without any individualized follow-up, illustrating how formative assessment becomes superficial when compressed into limited instructional time. This reflects the findings of Wiliam (2011), who emphasized that formative assessments must be thoughtfully integrated into instruction to be effective; otherwise, they risk becoming procedural rather than pedagogically impactful.

A second constraint involved rigid assessment formats. Teachers expressed difficulty in accurately measuring learning due to fixed requirements like the 5-item quiz format. Informant 5 explained that summarizing an entire lesson into just five questions made it hard to capture students' true understanding. Informant 6 added, "Difficulty in measuring progress objectively."

Class visits revealed that assessments were often strictly aligned with Most Essential Learning Competencies (MELCs), and alternative formats—such as verbal questioning or portfolios—were rarely used due to documentation challenges and lack of support. The absence of digital tools further restricted flexibility. Although teachers were open to technology, classrooms lacked functioning devices. As noted by Cusi, Morselli, and Sabena (2017), digital tools can enhance formative assessment, but their absence limits innovation in practice.

B. Learner Readiness and Comprehension Gap

This theme highlights how gaps in students' foundational skills and language comprehension hinder effective formative assessment in mathematics. Two key challenges emerged: low foundational skills and readiness (n=2) and language and comprehension barriers (n=1). These findings are consistent with Black and Wiliam (2009), who emphasize that the success of formative assessment depends heavily on learners' ability to understand both the content and the language in which assessment tasks are delivered. When students lack prerequisite knowledge or struggle with instructional language, assessment results may reflect these barriers rather than actual understanding—compromising the accuracy and usefulness of formative feedback.

Teachers reported that many students lacked the prerequisite knowledge for grade-level tasks. Informant 10 noted, "Not all of the students can cope up with the lesson because they lack in core knowledge," while Informant 9 emphasized the wide range of abilities in a single class. This confirms Abedi and Hofstetter (2001) found that English language learners (ELLs) scored, on average, more than five points lower than non-ELL students on the Grade 8 NAEP math test, and that providing accommodations like extra time and glossaries improved scores—underscoring the need for assessments that account for language and foundational skill differences. Without addressing these factors, formative assessments risk failing to accurately gauge student progress and inform instruction.

Language also emerged as a significant barrier. Informant 3 shared, "Learners have difficulty comprehending not just the problem but with the instructions as well," stressing the need for translations into Filipino or Ninorte Samarnon. This aligns with Black and Wiliam's (2019) view that formative assessments must be linguistically accessible. Observations showed students pausing quizzes to ask for translations, and teachers admitted that most assessments remain in English or Filipino, despite student comfort in local dialects.

C. Alignment and Resource Limitations

This theme highlights the dual challenge mathematics teachers face: the difficulty of designing cognitively demanding tasks aligned with the SOLO taxonomy and the lack of resources to support effective assessment. Two main issues emerged: difficulty designing higher-level cognitive tasks (n=1) and resource and material constraints (n=2).

Teachers expressed awareness of the complexity involved in crafting tasks that reach relational and extended abstract levels of the SOLO taxonomy. As Informant 6 noted, creating such questions demands significant time and effort. Despite exposure to training, many struggled to apply the framework to their grade levels due to the lack of concrete examples and scoring guides. This difficulty confirms with the findings of

Table 1
Thematic Network
Challenges and issues in implementing SOLO-based assessment

Theme	Category	Verbatim Responses (with Informants)
Instructional Constraints in Assessment Implementation	Time Constraints in Large or Varied Classes	"The challenges I have encountered in implementing formative assessment is time. Usually, in a 1-hour class discussion I cannot easily assess students' mathematical skills in a bigger class size." (Informant 8)
		"Limited class time." (Informant 2)
		"Usually talaga sir time constraint." (Informant 4)
		"Time constraints..." (Informant 7)
	Limited Flexibility in Assessment Formats	"Kay dire danay nami measure gud an learning sa bata kay talaga istrikto dapat kami sa 5-item… so sa 5-item tanan nga gitutdo mo magpipili kala 5 nga questions para ma sum up an learning sa bata." (Because sometimes we really can't measure the students' learning well since we are strictly required to give only a 5-item quiz… so out of everything you've taught, you need to choose just 5 questions to sum up the student's learning.) (Informant 5)
		"Difficulty in measuring progress objectively." (Informant 6)
Learner Readiness and Comprehension Gaps	Low Foundational Skills and Readiness	"Not all of the students can cope up with the lesson because they lack in core knowledge." (Informant 10)
		"It is very difficult to implement formative assessment where in a class there are students who can easily follow direction while some students have difficulty reading." (Informant 9)
	Language and Comprehension Barriers	"Learners have difficulty comprehending not just the problem but with the instructions as well. There is a need to translate the instructions to Filipino or in Ninorte Samarnon." (Informant 3)
Alignment and Resource Limitations	Difficulty Designing Higher-Level Cognitive Tasks	"Crafting questions that align with each level of the taxonomy." (Informant 6)
		"'Relational & Extended Abstract' tasks require more time and effort for the students to complete." (Informant 6)
	Resource and Material Constraints	"My challenges encountered in implementing formative assessments is that if my assessment is suit to the learners and limited resources." (Informant 1)
		"Resource limitation." (Informant 7)

Caniglia and Meadows (2018), who observed that even pre-service teachers struggle to generate conceptually rich, non-procedural questions aligned with SOLO, often defaulting to procedural tasks due to a lack of practical exemplars and assessment scaffolds.

The second challenge involves limited instructional materials. Informants 1 and 7 cited scarce resources as a barrier to designing learner-appropriate assessments. Observations revealed that teachers often relied on chalk, printed worksheets, or repurposed test items due to a lack of access to projectors, printers, or internet connectivity. This scarcity restricted their ability to provide interactive, differentiated feedback.

These constraints mirror broader findings by Drijvers et al. (2021) and Cusi, Morselli, and Sabena (2017), who emphasized that effective formative assessment depends not only on conceptual alignment but also on access to digital tools and support materials. Without these, the quality and impact of formative assessment are significantly reduced.

3. Conclusion

Challenges and issues encountered in implementing SOLO-based assessments highlight how systemic constraints, such as time pressure, resource scarcity, and limited professional development, hamper the application of higher-order thinking frameworks. Teachers struggle not with willingness but with feasibility, particularly in designing tasks at the relational and extended abstract levels. This implies that any effort to institutionalize SOLO-based assessments must account for these barriers and view teacher capacity-building as a long-term, systemic investment rather than a short-term intervention.

4. Recommendations

The school heads and curriculum implementers should review and enhance systemic support mechanisms. This includes allocating sufficient time for formative assessment design in lesson planning schedules, reducing teacher workload by streamlining administrative tasks, and ensuring the availability of context-relevant instructional materials. Furthermore, given the linguistic diversity in classrooms, teachers should be trained in language-sensitive assessment design, enabling them to construct bilingual or code-switched tasks that preserve both cognitive rigor and accessibility.

References

[1] Abedi, J., & Hofstetter, C. H. (2001). NAEP math performance and test accommodations: Interactions with student language background. CSE Technical Report.

[2] Abedi, J., Lord, C., Hofstetter, C., & Baker, E. L. (2001). Impact of student language background on NAEP math performance. CSE Technical Report.

[3] Abu Bakar, A. Y., & Hamid, A. H. A. (2019). Issues and challenges in implementing high order thinking skills (HOTS) in schools: The Malaysian perspective. International Journal of Management and Applied Science, 5(6), 55–59.

[4] Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability, 21*(1), 5–31.

[5] Caniglia, J. C., & Meadows, M. (2018). An application of the SOLO taxonomy to classify strategies used by pre-service teachers to solve "one-question" problems. Australian Journal of Teacher Education, 43(9).

[6] Cusi, A., Morselli, F., & Sabena, C. (2017). Promoting formative assessment in a connected classroom environment: Design and implementation of digital resources. *ZDM: The International Journal on Mathematics Education, 49*(1), 1–14.

[7] Department of Education- National Report of the Philippines, 2019.

[8] Hidayat, R. H., & Lestari, Y. B. (2022). Challenges teachers face in applying high order thinking skills: A case study at Madani Super Camp English Course. In *Proceedings of the 2nd International Conference on Education and Technology (ICETECH 2022)*.

[9] Sa'dijah, C., Murtafiah, W., Anwar, L., Nurhakiki, R., & Cahyowati, E. T. D. (2021). Teaching higher-order thinking skills in mathematics classrooms: Gender differences. *Journal on Mathematics Education, 12*(1), 159–180.

[10] Wheary, J., & Ennis, R. H. (1995). Gender Bias In Critical Thinking: Continuing The Dialogue. Educational Theory, 45(2), 213–223.
[11] Wiliam, D. (2011). *Embedded formative assessment*. Solution Tree Press.
[12] Zana, F. M., Sa'dijah, C., & Susiswo, S. (2022). LOTS to HOTS: How do mathematics teachers improve students' higher-order thinking skills in the class? International Journal of Trends in Mathematics Education Research.