CHALLENGES IN THE PREPARATION OF PERFORMANCE TASKS: BASIS FOR A PROPOSED GRASPS-BASED GUIDE ON PERFORMANCE TASKS IN MATHEMATICS

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ABSTRACT

Performance tasks enable the development of not just the knowledge but also the skills of students. Unfortunately, teachers find it challenging to prepare their performance tasks. To help teachers, an authentic framework for the preparation of performance tasks should be utilized. GRASPS, as an assessment model, can help teachers develop authentic assessment. In this study, the researcher aimed (1) to determine the profile of the teacher-respondents in terms of sex, age, civil status, years in service, and highest educational attainment; (2) to recognize the challenges in the preparation of performance tasks in mathematics in terms of goal, role, audience, situation, product, and standards and criteria for success (GRASPS); (3) to identify if there is a significant difference in the challenges in the preparation of performance tasks in mathematics in terms of GRASPS when respondents are grouped according to their profile; and lastly, (4) to propose a GRASPS-based guide performance tasks in mathematics. Through descriptive research design, the study was conducted and evaluated. The public secondary mathematics teachers answered a survey questionnaire. The level of challenge in the preparation of performance tasks in mathematics were identified. In terms of goal, the challenges in the preparation of performance tasks are challenging. On the other hand, the role, audience, situation, product and standards, and criteria for success are found to be very challenging. Also, based on the results of this study, the researcher found that there is no significant difference in the challenges in the preparation of performance tasks in mathematics in terms of GRASPS when respondents are grouped according to their profile. Thus, based on the most challenging indicators, the proposed GRASPS-based guide performance tasks in mathematics were crafted and designed to help teachers develop authentic assessment and to aid 21st-century learners develop metacognition.

Keywords: *GRASPS, assessment tools, performance tasks, challenges in the preparation of assessments, K-to-12 Curriculum*

INTRODUCTION

"Assessment should support the learning of important Mathematics and furnish useful information to both teachers and students" (Principles, Standards, and Expectations, NCTM, para.7). This is the vision for assessment of the National Council of Teachers of Mathematics (NCTM). With this academic standard, The Common Core State Standards (CCSS) in English Language Arts and Mathematics, The Next Generation Science Standards (NGSS), College, Career and Citizenship Standards for Social Studies (C3), and National Core Arts Standards (NCAS) call for education outcomes that involve more than tests of multiple choices and short-answer assessments. The new standards should concentrate on the expected success of students who are prepared for higher education and employment, instead of merely defining a scope and sequence of knowledge and skills (McTighe, 2019). For this reason, utilization of performance tasks is a must because of its importance in developing of not just the knowledge, but also the skills of students.

The Philippines' Department of Education (DepEd) had likewise seen the significance of performance tasks and was able to include it as one of the components of assessment in mathematics with a weight of 40%. Assessment tasks are given several times during the quarter following DepEd Order No. 8, s. 2015. Performance tasks as defined by DepEd permits students to show what they know and what they can do in a variety of ways.

To build a more authentic framework for performance tasks, according to Wiggins and McTighe (2015), the GRASPS model should be utilized. The GRASPS model establishes a real-world goal; a significant role for the learners; an authentic or visualized audience; a contextualized situation involving real-world application; products generated by students; and standards and criteria for success by which performance would be evaluated and assessed. It is a design tool that enables the creation and innovation of performance tasks with focus on context (Iter, 2017). Moreover, with the utilization of GRASPS as an assessment model, teachers can develop authentic assessment and students can develop metacognition (Yang, 2019). DepEd acknowledged the significance of GRASPS and stated that it shall be used as a model in designing performance tasks to attain performance standards through DepEd Memorandum No. 158, s. 2011.

Unfortunately, findings in the study of Lasaten (2016) revealed that 70% of teachers are having difficulty on performance task preparation. On testing in general, quality of assessment ranked first on assessment problems encountered by teachers. Similarly, the study of Lumadi (2013) revealed that still the major challenge teachers face in classroom assessment is the preparation and quality of assessment.

Therefore, in this study, the researcher aimed to determine the challenges in the preparation of performance tasks among public secondary Junior High School (JHS) mathematics teachers. The data that will be gathered from this investigation shall be utilized as basis for a proposed researcher-made GRASPS-based guide on performance tasks in mathematics.

Furthermore, the researcher hopes to help teachers in developing authentic assessment and likewise aid 21st-century learners in developing metacognition through the GRASPS-based guide performance tasks in mathematics.

METHOD

In this study, the researcher utilized the descriptive research method. Siedlecki (2020) defined descriptive research as characterizing people, events, or conditions in their natural environment. The researcher does not modify any of the variables; instead, the sample and/or the variables are described. Descriptive research examines a population's characteristics, identifies problems within a unit, organization, or population, or examines differences in traits or practices between institutions or even countries.

The population of the study is comprised of the public secondary mathematics teachers from the Educational Districts II and III of Bulacan. Districts II and III both have seven (7) municipalities. The researcher performed cluster sampling by randomly selecting one municipality from each district. From District II, the Municipality of Bustos was randomly selected with a total of four (4) public secondary high schools. On the other hand, the municipality of Angat with four (4) public secondary school was randomly selected. Since the researcher used cluster sampling, all high school mathematics teachers from the randomly selected municipalities, a total of 72, were the respondents of the study.

An expert-validated and reliability-tested researcher-made questionnaire was used to garner the required data that helped the researcher determine the challenges in the preparation of performance tasks in mathematics. This instrument was assessed and validated by six (6) experts in the field for content validity. The research instrument obtained a scale-level content validity indices computed using the average method (S-CVI/Ave) of 1.00 and interpreted as excellent. This indicates that the items included in each scale are relevant to and representative of the targeted indicators or challenges measured by the research instrument.

The research instrument has also undergone a reliability testing on one of the schools in Pandi, Bulacan with 30 teacher-respondents handling mathematics subjects. Using Cronbach's Alpha, the reliability coefficient for the items in Goal and Product are 0.903 and 0.944, respectively, interpreted as excellent. It also revealed that the internal consistency reliability of items in Role, Audience, Situation, and Standards and Criteria for Success are 0.877, 0.865, 0.875, and 0.842, respectively, interpreted as good. The results of the reliability test showed that the research instrument is reliable.

In obtaining what is required in this study, the researcher used the Likert Scale. To interpret the level of challenge in the preparation of performance tasks in mathematics from the consolidated points of the respondents' answers to each item, the Net Agreement Rating (NAR) was used as follows:

Table 1
Verbal Interpretation of the Level of Challenge in the Preparation of Performance Tasks in Mathematics

Net Agreement Rating (NAR)	Description
70-100	Extremely Challenging
50-69	Very Challenging
30-49	Challenging
10-29	Moderately Challenging
0-9	Neutral

The data gathering started on the 20th of June and ended on the 28th of June, 2022. Almost all the teacher-respondents in the cooperating schools gave their remarks and comments while answering the questionnaire. The results were immediately and carefully organized and evaluated after successfully gathering the needed data for the study. The data was coded, tallied, and tabulated with the use of statistical tools to facilitate the presentation and interpretation of results. The frequency table and percentage distribution were used to summarize the distribution of the profile of the teacher-respondents and to determine the overall percentage of the respondents who answered according to their sex, age, civil status, years in service, and highest educational attainment. On the other hand, the researcher used Net Agreement Rating to assess inter-rater variability or to decide whether one technique for measuring a variable can substitute another. It is used by the researcher to identify the agreement rating to the challenges of teacher-respondents. The researcher also used the Mann-Whitney U-Test, a non-parametric test, to compare two population means, that is, to determine whether there is a significant difference in the challenges in the preparation of performance tasks in mathematics in terms of GRASPS when respondents are grouped according to their sex. Finally, the Kruskal-Wallis H-Test, a rank-based

non-parametric test, was used by the researcher to identify whether there are challenges in the preparation of performance tasks in mathematics in terms of GRASPS when respondents are grouped according to their profile in terms of age, civil status, years in service, and highest educational attainment. Furthermore, with the help and guidance of a statistician, the challenges in preparing performance tasks were identified.

RESULTS

This study aimed to determine the challenges in the preparation of performance tasks among secondary mathematics teachers. The results are intended as basis for a proposed researcher-made GRASPS-based guide on performance tasks in mathematics. Through the analyzed data and obtained results, the summary and findings were revealed.

1. The Profile of Mathematics Teachers

Out of 72 teacher-respondents, 65.28% or 47 are female while the remaining 25 respondents or 34.72% are male. Twenty-eight (28) or 38.89% of the teacher-respondents are within 21-30 years old age range. Twenty-two (22) teachers or 29% were 31-40 years old; 14 and 8 teachers or 19.44% and 11.11% are 41-50 and 51-60 years old, respectively. Fourty (40) out of 72 or 55.55% are married while 28 or 38.89% are single; 2 or 2.78% are separated; and the rest of the teachers are widowed. Six (6) teacher-respondents or 8.34% have been in service for two (2) years and below, 19 or 26.38% have been serving within 3-5 years; and 19 or 26.38% have been in the service for 6-8 years. In addition, 13 or 18.06% have been in service for 9-11 years, 4 or 5.56% of them are 12-14 years in service; and 11 or 15.28% have exceeded 15 years in the service. More than one-half or 39 teachers possess Bachelor's Degree with Master Units or 54.17%; while 27 teachers or 37.50% have Bachelor's Degree only. However, 6 or 8.33% of the remaining respondents are Master's Degree holders. No teacher possesses Master's Degree with Doctorate Units holder or has a Doctorate Degree.

2. The Challenges in the Preparation of Performance Tasks in Mathematics

The challenges in the preparation of performance tasks in mathematics was evaluated and assessed by the teacher-respondents of the study as to the following variables:

Table 2

Net Agreement Ratings of the Respondents in the Challenges in the Preparation of Performance Tasks in Mathematics in Terms of Goal

Indicators/Challenges	Agreement	f	%	NAR	VI
1. I find it challenging to create a statement of the task.	SD	0	0.00	38.89	Challenging
	D	22	30.56		
	A	41	56.94		
	SA	9	12.50		
2. I find it challenging to set an appropriate level of challenge.	SD	0	0.00	63.89	Very Challenging
	D	13	18.06		
	A	48	66.67		
	SA	11	15.28		
3. I find it challenging to provide the learner with the outcome of the learning experience.	SD	0	0.00	36.11	Challenging
	D	23	31.94		
	A	41	56.94		
	SA	8	11.11		
4. I find it challenging to provide a contextualized experience	SD	0	0.00	50.00	Very Challenging
	D	18	25.00		
	A	46	63.89		
	SA	8	11.11		
5. I find it challenging to design a localized task suitable for the learners.	SD	0	0.00	41.67	Challenging
	D	21	29.17		
	A	42	58.33		
	SA	9	12.50		

Legends: SD - Strong Disagree, D - Disagree, A - Agree, SA - Strongly Agree; f - Frequency; % - Percentage; NAR - Net Agreement Rating; VI - Verbal Interpretation; 70-100: Extremely Challenging; 50-69: Very Challenging; 30-49: Challenging; 10-29: Moderately Challenging; and 0-9: Neutral

Table 2 shows the challenges in the preparation of performance tasks in mathematics in terms of Goal. The highest among the indicators is the statement, “I find it challenging to set an appropriate level of challenge” with a Net Agreement Rating of 63.89 interpreted as Very Challenging. The result of the study is similar to the study of Metin (2013) which revealed that teachers have difficulty in determining the appropriate level of challenge for the preparation of students’ performance tasks.

The lowest among the indicators is the statement, “I find it challenging to provide the learner with the outcome of the learning experience” with a Net Agreement Rating of 36.11 interpreted as Challenging.

In general, 3 out of 5 indicators under Goal are found to be Challenging. This implies that teachers are challenged in determining the challenge, issue, or problem to solve, which provides the student with the outcome of the learning experience and the contextual purpose of the experience and product creation. These findings are supported by the study of Dawn, et al. (2016) where teachers believe that goal setting is an effective strategy for raising students' academic engagement. However, teachers ultimately feel unprepared to incorporate goal setting into academic content to promote active student involvement. It is suggested in the study that, given the value teachers place on goal-setting abilities, there is a need to develop techniques to assist teachers in integrating goal setting.

In the study of Dotson (2016), he tackled and gave evidence to the significance of goal setting. He discussed the teachers and students in Carter County who have been employing the goal setting resulted in the district's significant development on, not only national assessments, but also local exams. In addition, the number of students who pass college and career readiness benchmarks has climbed dramatically. His study also reported that out of 328 student-respondents, 69% made progress after goal setting was utilized as compared to only 60% prior

to the implementation. This implies that goal setting has given the educational system something to focus on in creating performance tasks.

In performance tasks, goals should provide learners the outcome as well as the context for the experience and product development. The teacher is expected to provide a statement of the task and to establish the goal, problem, or challenge (Performance Assessment: G R A S P S, Curriculum Hub, 2017). Similarly, Doubet (n.d.) suggested that goals should be transferable and applicable through different areas and topics of learning. Goal, problem, challenge, or obstacle in the task should be identified.

Goal setting helps students stay on track to achieve their objectives. It gives a clear path to success together with making goals that are S.M.A.R.T. (specific, measurable, attainable, relevant, and time-bound). These are essential in achieving success. Goals must also be accompanied with a detailed plan of action that defines the activities to be done to achieve maximum success. Monitoring the plan's progress ensures that the actions being used are yielding the desired results. Finally, recognizing and celebrating students' accomplishment promotes the importance of effort and recognizes achievement.

Table 3
Net Agreement Ratings of the Respondents in the Challenges in the Preparation of Performance Tasks in Mathematics in Terms of Role

Indicators/Challenges	Agreement	f	%	NAR	VI
1. I find it challenging to define the role of the learners in the task.	SD	1	1.39	44.44	Challenging
	D	19	26.39		
	A	40	55.56		
	SA	12	16.67		
2. I find it challenging to provide the learner with an individualized performance task.	SD	0	0.00	50.00	Very Challenging
	D	18	25.00		
	A	36	50.00		
	SA	18	25.00		
3. I find it challenging to provide roles within the task that allow learners to complete real-world applications of content.	SD	0	0.00	69.44	Very Challenging
	D	11	15.28		
	A	43	59.72		
	SA	18	25.00		
4. I find it challenging to design a role that is engaging or interesting to do by the learners.	SD	0	0.00	66.67	Very Challenging
	D	12	16.67		
	A	45	62.50		
	SA	15	20.83		
5. I find it challenging to create a real-world multidisciplinary role that is community-based.	SD	0	0.00	55.56	Very Challenging
	D	16	22.22		
	A	41	56.94		
	SA	15	20.83		

Legends: SD - Strong Disagree, D - Disagree, A - Agree, SA - Strongly Agree; f - Frequency; % - Percentage; NAR - Net Agreement Rating; VI - Verbal Interpretation; 70-100: Extremely Challenging; 50-69: Very Challenging; 30-49: Challenging; 10-29: Moderately Challenging; and 0-9: Neutral

Discovered in Table 3 are the challenges in the preparation of performance task in mathematics in terms of Role. "I find it challenging to provide roles within the task that allow learners to complete real-world applications of content" is the statement that get the highest Net Agreement Rating of 69.44 and inferred as Very Challenging. In the study of Boer, et al. (2016), it was mentioned that various real-world personas offer thorough and practical insights that aid in directing the development of personalized education. By giving a role to a student, teachers enable them to develop an independent, active learning attitude, self-management of the learning

process.

On the other hand, the statement, “I find it challenging to define the role of the learners in the task.” resulted as the lowest among the indicators with a Net Agreement Rating of 44.44 and interpreted as Challenging.

Generally, 4 out of 5 indicators under Role are found to be Very Challenging. This means that teachers are challenged in providing learners with a role they might take in a familiar real-life situation, which meant to provide the student with the position or individual persona that they will become to accomplish the goal of the performance task.

Authentic learning connects what students learn in school to real-world challenges, problems, and applications; learning experiences should reflect the complexities and ambiguities of everyday life (Authentic Learning: What, Why and How, Australian Council for Educational Leaders, 2016). Similarly, Herrington, et al. (2014) said that authentic learning is a teaching strategy that places performance tasks in the context of future application. It proposes a new instructional model for the design and implementation of complex and realistic learning tasks, based on sound principles.

Role in a performance task is intended to offer the learner with the position or persona that they will assume to complete the performance task's goal. Students can complete real-world applications of standards-based curriculum in most of the roles found within the tasks. The role could be for just one student, or it might be a small group experience in many cases. Based on group dynamics, students may collaborate or take on a part of the responsibility. These positions will demand students to create unique and unique products that demonstrate their understanding of the material through the application of material and a variety of abilities from several disciplines (Performance Tasks, Defined Learning, n.d.).

As claimed by Wallace (2019), roles in performance tasks are effective tools for establishing connections with students. The following are some of its advantages: (1) gives insight into your students' habits, (2) provides personalized learning, (3) creates a consistent environment, and (4) assists you in developing better learning opportunities. Roles in a performance task are important for students considering the voice they should assume (McTighe, et.al., 2020).

Yang (2019) stated that teachers define the role of students in the performance task. They are to identify the student’s persona in accomplishing the goal of the performance task. On the other hand, students define roles and identify knowledge and strategies. This includes the content knowledge that they need and strategies that are effective and available for them. Students should also identify the strengths and limitations of the role.

As stated by Wallace (2019), to get the most out of these roles in performance tasks, learner personas should be filled with rich, relevant material based on real-life experiences. As a teacher, the role is to lay the groundwork for meaningful learning by developing these roles. Learner personas are a tried-and-true technique to demonstrate to your learners that you care about them as individuals while also ensuring that they connect with your content. He added in 2021 that by using roles in a performance task, it ensures that students connect with information and feel heard and understood. Using them daily will help guarantee that the class is on the same page when it comes to Instructional Design, resulting in high-value content that is useful to your learners and better outcomes for both teachers and learners.

Table 4

Net Agreement Ratings of the Respondents in the Challenges in the Preparation of Performance Tasks in Mathematics in Terms of Audience

Indicators/Challenges	Agreement	f	%	NAR	VI
1. I find it challenging to identify the target audience for the task.	SD	2	2.78	38.89	Challenging
	D	20	27.78		
	A	42	58.33		
	SA	8	11.11		
2. I find it challenging to identify an audience that will make a decision based on the product and presentation created by the student assuming the role in the performance task.	SD	2	2.78	58.33	Very Challenging
	D	13	18.06		
	A	46	63.89		
	SA	11	15.28		
3. I find it challenging to provide an audience that can enhance the interest of the task and the nature of the assessment.	SD	2	2.78	63.89	Very Challenging
	D	11	15.28		
	A	47	65.28		
	SA	12	16.67		
4. I find it challenging to identify an audience to whom learners should commit their work.	SD	2	2.78	36.11	Challenging
	D	21	29.17		
	A	38	52.78		
	SA	11	15.28		
5. I find it challenging to identify an audience that will evaluate the product or performance of the learner.	SD	2	2.78	55.56	Very Challenging
	D	14	19.44		
	A	51	70.83		
	SA	5	6.94		

Legends: SD - Strong Disagree, D - Disagree, A - Agree, SA - Strongly Agree; f - Frequency; % - Percentage; NAR - Net Agreement Rating; VI - Verbal Interpretation; 70-100: Extremely Challenging; 50-69: Very Challenging; 30-49: Challenging; 10-29: Moderately Challenging; and 0-9: Neutral

Determined in Table 4 are the challenges in preparation of performance task in mathematics in terms of Audience for all grade levels in secondary school. The statement, “I find it challenging to provide an audience that can enhance the interest of the task and the nature of the assessment.” got the highest Net Agreement Result of 63.89 inferred as Very Challenging. As stated in the study of Zaharani, et al. (2020), the presence of an audience inspires and motivates a person to perform better, and that the perception of the audience may drive individuals to strive for greater excellence.

On the other hand, the indicator, “I find it challenging to identify the target audience for the task” received the lowest Net Agreement Rating of 38.89 inferred as Challenging.

Overall, 3 out of 5 indicators in the challenges in the preparation of performance tasks in mathematics in terms of Audience are interpreted as Very Challenging. It was inferred that teachers feel challenged in establishing the target audience for whom students solve the issue or develop the product.

In the study of Gafoor & Kurukkan (2015), it is indicated that the teachers need to realize the importance of making school mathematics interesting for students to take effort in learning it.

McTighe, et al. (2020) expressed that the audience in a performance task is significant because students must consider the voice to which they should commit the work. The findings of Zaharani, et al. (2020) also revealed that the presence of an audience inspires and motivates a person to perform better, and that the perception of the audience may drive individuals to strive for greater excellence.

Students can become deeper learners by addressing the needs of their audience. Students will be required to think strategically, communicate effectively, and apply multidisciplinary content and abilities in meaningful ways as part of this deep learning. Also, students are forced to examine

information, ideas, and concepts through a different lens to consider the audience. Students will have to put their knowledge of the subject to use to design goods that are tailored to the needs of their target market. Knowledge entails much more than memorizing facts. In addition to that, students use their expertise to create products for their target audience. This allows individuals to showcase their knowledge and expertise by broadening their understanding (Reese, n.d.). This implies that establishing an audience in a performance task is significant.

Yang (2019) indicated that teachers define the target audience for the product or service. They are to determine the target audience whom students are solving the problem for or creating the product for. In the meanwhile, students practice empathy and consider the needs of the audience. They are to identify the insights they have about the target audience including what the audience might say, think, do and feel.

Cornally (2012) suggested looking for genuine audiences. Ascertain that the teacher will not be always among the audience because that's what it means to have established an authentic audience.

Creating a meaningful audience will provide a deeper learning experience and significance for performance tasks, thus assisting in the creation of authentic activities with a purposeful audience. The incorporation of a specific audience based on real-world connections can make activities more realistic. Performance tasks become authentic when they are related to a certain profession and have a target audience that student must consider when creating their products.

Table 5
Net Agreement Ratings of the Respondents in the Challenges in the Preparation of Performance Tasks in Mathematics in Terms of Situation

Indicators/Challenges	Agreement	f	%	NAR	VI
1. I find it challenging to define the context of the scenario.	SD	0	0.00	52.78	Very Challenging
	D	17	23.61		
	A	46	63.89		
	SA	9	12.50		
2. I find it challenging to explain the situation, problem, or scenario in detail.	SD	0	0.00	38.89	Challenging
	D	22	30.56		
	A	40	55.56		
	SA	10	13.89		
3. I find it challenging to provide a real-world situation of the performance task.	SD	0	0.00	50.00	Very Challenging
	D	18	25.00		
	A	39	54.17		
	SA	15	20.83		
4. I find it challenging to identify a localized situation suitable for the learners.	SD	0	0.00	44.44	Challenging
	D	20	27.78		
	A	41	56.94		
	SA	11	15.28		
5. I find it challenging to identify a situation for varied learning styles.	SD	0	0.00	55.56	Very Challenging
	D	16	22.22		
	A	45	62.50		
	SA	11	15.28		

Legends: SD - Strong Disagree, D - Disagree, A - Agree, SA - Strongly Agree; f - Frequency; % - Percentage; NAR - Net Agreement Rating; VI - Verbal Interpretation; 70-100: Extremely Challenging; 50-69: Very Challenging; 30-49: Challenging; 10-29: Moderately Challenging; and 0-9: Neutral

Table 5 reveals the challenges in the preparation of performance tasks in mathematics among the public secondary teachers according to Situation. Among all the statements, “I find it challenging to identify a situation for varied learning styles” got the highest Net Agreement Rating of 55.56 inferred as Very Challenging. This is evidently important as cited by Ma, et al. (2021)

because most learners who have access to the mathematical problem-solving expertise will only try to understand and solve a problem when they are familiar with the situation.

On the other hand, “I find it challenging to explain the situation, problem, or scenario in detail” received the lowest Net Agreement Rating of 38.89 interpreted as Challenging.

Overall, 3 out of 5 indicators in the challenges in terms of constructing the Situation are interpreted as Very Challenging. It tells that teachers are challenged in constructing the scenario or clarifying the situation's context, which provides the learners with a contextual background for the task.

According to Doubet (n.d.), it is important that the teacher is to set the context of the scenario and to explain the situation as students will learn about the real-world application for the mathematics’ performance task. Situation should be explained clearly in specifics, so as the context of the situation should be identified.

Yang (2019) also suggested that teachers might refer to the MYP global context exploration and the 21st century skills that students need to develop in the process, then set the scenario. Teachers are to define the situation and why it matters to learners to create the product while students are analyzing the situation encountered and considering verbal and nonverbal interaction between people for them to connect to the real-world situation.

Similarly, Pete, et al. (2016) suggested that to write a problem scenario, one must choose a problem area, a challenge, and a performance task to focus on, pick an audience, and outline the requirement.

Table 6
Net Agreement Ratings of the Respondents in the Challenges in the Preparation of Performance Tasks in Mathematics in Terms of Product

Indicators/Challenges	Agreement	f	%	NAR	VI
1. I find it challenging to articulate what the learners need to create.	SD	0	0.00	55.56	Very Challenging
	D	16	22.22		
	A	47	65.28		
	SA	9	12.50		
2. I find it challenging to provide a reason as to why learners need to create the product or performance.	SD	0	0.00	36.11	Challenging
	D	23	31.94		
	A	41	56.94		
	SA	8	11.11		
3. I find it challenging to design product or presentation to perform by learners using multiple intelligences.	SD	1	1.39	61.11	Very Challenging
	D	13	18.06		
	A	41	56.94		
	SA	17	23.61		
4. I find it challenging to provide various opportunities for learners to demonstrate understanding, depending on their learning style and abilities.	SD	1	1.39	58.33	Very Challenging
	D	14	19.44		
	A	47	65.28		
	SA	10	13.89		
5. I find it challenging to create a product that demonstrates knowledge, skills, and processes of the learners.	SD	0	0.00	58.33	Very Challenging
	D	15	20.83		
	A	49	68.06		
	SA	8	11.11		

Legends: SD - Strong Disagree, D - Disagree, A - Agree, SA - Strongly Agree; f - Frequency; % - Percentage; NAR - Net Agreement Rating; VI - Verbal Interpretation; 70-100: Extremely Challenging; 50-69: Very Challenging; 30-49: Challenging; 10-29: Moderately Challenging; and 0-9: Neutral

Table 6 uncovered the challenges in the preparation of performance task in mathematics according to Product. “I find it challenging to design product or presentation to perform by learners using multiple intelligences” is the statement that ranked as highest among the indicators with the

Net Agreement Rating of 61.11 interpreted as Very Challenging. These results show that most of the teachers have difficulty in preparing assessment considering the multiple intelligences. It was revealed that teachers have very limited knowledge and misconceptions regarding the multiple intelligence theory (Tithi and Arafat, 2013).

On the other hand, the statement, “I find it challenging to provide a reason as to why learners need to create the product or performance” received the lowest Net Agreement Rating of 36.11 inferred as Challenging.

In general, 4 out of 5 indicators for the challenges in terms of Product are interpreted as Very Challenging. This implies that teachers are challenged in presenting a clear image of the development or performance of the product and answers the WHAT and WHY of the task.

Hence, according to the study of Bland, et al. (2018), a performance task should develop a product to assess students' ability to authentically demonstrate knowledge, skills, and processes in a way that adds value, interest, and motivation to students beyond the score or grade.

As claimed by McTighe, et al. (2020), a product in a performance task should specify what the students will develop to demonstrate their understanding and skill in relation to the targeted goal. When using a task as an assessment, it is important that the generated products provide appropriate evidence of the targeted standards or outcomes.

Additionally, a product in a performance task should clarify what the learners will create or produce and why they will create or produce it (Doubet, n.d.).

Table 7
Net Agreement Ratings of the Respondents in the Challenges in the Preparation of Performance Tasks in Mathematics in Terms of Standards and Criteria for Success

Indicators/Challenges	Agreement	f	%	NAR	VI
1. I find it challenging to determine the expectations to be met.	SD	0	0.00	50.00	Very Challenging
	D	18	25.00		
	A	41	56.94		
	SA	13	18.06		
2. I find it challenging to provide learners with a clear picture of success of what is supposed to be done.	SD	0	0.00	52.78	Very Challenging
	D	17	23.61		
	A	42	58.33		
	SA	13	18.06		
3. I find it challenging to set standards for success (i.e., rubric, criteria).	SD	0	0.00	55.56	Very Challenging
	D	16	22.22		
	A	43	59.72		
	SA	13	18.06		
4. I find it challenging to inform learners how the assumed audience will evaluate their work.	SD	0	0.00	61.11	Very Challenging
	D	14	19.44		
	A	48	66.67		
	SA	10	13.89		
5. I find it challenging to provide a performance checklist for learners.	SD	1	1.39	38.89	Challenging
	D	21	29.17		
	A	37	51.39		
	SA	13	18.06		

Legends: SD - Strong Disagree, D - Disagree, A - Agree, SA - Strongly Agree; f - Frequency; % - Percentage; NAR - Net Agreement Rating; VI - Verbal Interpretation; 70-100: Extremely Challenging; 50-69: Very Challenging; 30-49: Challenging; 10-29: Moderately Challenging; and 0-9: Neutral

Shown on the table presented above are the challenges in preparation of performance tasks in mathematics in terms of Standards and Criteria for Success. “I find it challenging to inform learners how the assumed audience will evaluate their work” is the statement that ranked as

highest among the indicators with the Net Agreement Rating of 61.11 interpreted as Very Challenging. Similarly, in the study of Metin (2013), it revealed that teachers struggle in constructing rubric when creating performance tasks. It was discovered that teachers lack sufficient knowledge regarding how to explain the degree, extent, and regulation of a rubric in a performance task.

Furthermore, the statement, “I find it challenging to provide a performance checklist for learners” got the lowest Net Agreement Rating of 38.89 inferred as Challenging.

In a general sense, 4 out of 5 indicators in the challenges in terms of Standards and Criteria for Success are interpreted as Very Challenging. This implies that teachers experience challenges in determining the expectations to be met and informing learners how the assumed audience will evaluate their work.

Performance tasks should allow students to see what a genuine task in a profession looks like, such as what it takes to be a writer, mathematician, historian, or scientist. Some research revealed that when students grasp the criteria for success with a learning task and use those criteria while working, achievement increases (Bookhart, 2016).

To do that, Yang (2019) said that teachers should establish the criteria used to evaluate students. These require criteria and strands that can effectively evaluate students’ performance. On the other hand, the students should use criteria to monitor the process and evaluate their own product.

This implies that Standards and Criteria for Success are essential in creating a performance task because they help students understand what qualities their work should have. As a result, rubrics assist teachers in teaching, coordinating instruction and evaluation, and supporting students in learning (Brookhart, 2013).

3. Difference in the Challenges in the Preparation of Performance Tasks in Mathematics when Respondents were Grouped According to their Profile

The significant difference in the challenges in the preparation of performance tasks in mathematics according to the profiles of the public secondary mathematics teachers is inferred through the following p-values.

Table 8
Difference in the Challenges in the Preparation of Performance Tasks in Mathematics when the Respondents were Grouped According to Sex

Indicators/ Challenges		Mean Rank	p-value	Decision	Interpretation
Goal	Male	31.54	0.074	Fail to Reject H_o	Not significant
	Female	39.14			
Role	Male	37.26	0.792	Fail to Reject H_o	Not significant
	Female	36.10			
Audience	Male	39.90	0.228	Fail to Reject H_o	Not significant
	Female	34.69			
Situation	Male	37.66	0.687	Fail to Reject H_o	Not significant
	Female	35.88			
Product	Male	36.56	0.982	Fail to Reject H_o	Not significant
	Female	36.47			
Standards and Criteria for Success	Male	37.64	0.701	Fail to Reject H_o	Not significant
	Female	35.89			

The table presents the mean rank of the male and female teacher-respondents. In terms of Goal, female teachers are more challenged than male with a mean rank of 39.14.

In terms of Role, Audience, Situation, Product, and Standards and Criteria for Success, male teachers are more challenged than the female teacher-respondents: in Role, the mean rank is 37.26; in Audience, the mean rank is 39.90; in Situation, the mean rank is 37.66; in Product, the mean rank is 36.56; and in Standards and Criteria for Success, the mean rank is 37.64.

Although the mean rank implies that male teachers are more challenged than female teachers in the preparation of performance task, there is still no significant difference in the challenges in the preparation of performance tasks in mathematics when the respondents were grouped according to their sex because all the indicators or challenges obtained a p-value higher than the level of significance (α=0.05): Goal has a p-value of 0.074; Role has a p-value of 0.792; Audience has a p-value of 0.228; Situation has a p-value of 0.687; Product has a p-value of 0.982; and Standards and Criteria for Success has a p-value of 0.701.

These findings are supported by the study of Winkelmann (2016) that states that the sex of a teacher had no significant effect on their performance. Similarly, Wanakacha (2018) revealed that sex difference did not have an impact on both intrinsic and extrinsic motivation, and motivation of teachers to perform their core functions including creating assessments.

Table 9

Difference in the Challenges in the Preparation of Performance Tasks in Mathematics when the Respondents were Grouped According to Age

Indicators/ Challenges		Mean Rank	p-value	Decision	Remarks
Goal	21-30 years old	37.04	0.502	Fail to Reject H_o	Not significant
	31-40 years old	34.48			
	41-50 years old	34.04			
	51-60 years old	44.50			
Role	21-30 years old	37.04	0.971	Fail to Reject H_o	Not significant
	31-40 years old	36.25			
	41-50 years old	34.79			
	51-60 years old	38.31			
Audience	21-30 years old	36.46	0.982	Fail to Reject H_o	Not significant
	31-40 years old	35.64			
	41-50 years old	38.07			
	51-60 years old	36.25			
Situation	21-30 years old	35.75	0.395	Fail to Reject H_o	Not significant
	31-40 years old	33.59			
	41-50 years old	37.07			
	51-60 years old	46.13			
Product	21-30 years old	36.71	0.683	Fail to Reject H_o	Not significant
	31-40 years old	33.57			
	41-50 years old	37.79			
	51-60 years old	41.56			
Standards and Criteria for Success	21-30 years old	34.57	0.479	Fail to Reject H_o	Not significant
	31-40 years old	33.84			
	41-50 years old	41.79			
	51-60 years old	41.31			

Revealed in Table 9 is the mean rank of the teacher-respondents in terms of age. The results show that teachers whose age range from 51-60 find it more challenging to prepare the Goal, Role Situation, and Product of a performance task. In Goal, the mean rank is 44.50; in Role, the mean rank is 38.31; in Situation, the mean rank is 46.13; and in Product, the mean rank is 41.56. On the other hand, teachers whose age range from 41-50 years old find it more challenging to prepare Audience, and Standards and Criteria for Success of a performance task. The mean rank for Audience is 38.07. In Standards and Criteria for Success, the mean rank is 41.79.

Even though teachers whose age range from 51-60 years old and 41-50 years old are more challenged in the preparation of performance task using the mean rank, still, all the indicators or challenges has p-values higher than the level of significance (α=0.05). This means that, there is no significant difference in the challenges in the preparation of performance tasks in mathematics when the respondents are grouped according to their age: the p-value for Goal is 0.502; for Role, it is 0.971; for Audience, it is 0.982; for Situation, it is 0.395; for Product, it is 0.683; and for Standards and Criteria for Success, it is 0.479.

The result of the study is similar to the study of Shah and Udgaonkar (2018) where the majority of students did not perceive age as a barrier to learning as long as the teacher is engaged and enthusiastic about doing so. Meanwhile, the results of the study of Ismail and Abas (2018) is incongruent since it was found that there is a significant difference between the teachers' age in terms of their effectiveness, suggesting that older teachers are more effective than younger ones.

Table 10

Difference in the Challenges in the Preparation of Performance Tasks in Mathematics when the Respondents were Grouped According to Civil Status

Indicators/ Challenges		Mean Rank	p-value	Decision	Remarks
Goal	Single	36.04	0.961	Fail to Reject H_o	Not significant
	Married	36.38			
	Separated	41.00			
	Widowed	41.00			
Role	Single	37.98	0.110	Fail to Reject H_o	Not significant
	Married	34.14			
	Separated	65.00			
	Widowed	34.50			
Audience	Single	36.46	0.973	Fail to Reject H_o	Not significant
	Married	36.13			
	Separated	40.50			
	Widowed	40.50			
Situation	Single	35.75	0.097	Fail to Reject H_o	Not significant
	Married	35.33			
	Separated	67.50			
	Widowed	39.50			
Product	Single	37.79	0.459	Fail to Reject H_o	Not significant
	Married	34.70			
	Separated	53.00			
	Widowed	38.00			
Standards and Criteria for Success	Single	37.73	0.049	Reject H_o	Significant
	Married	33.39			
	Separated	66.00			
	Widowed	52.00			

Discovered in Table 10 is the mean rank of the teacher-respondents in terms of their civil status. The results reveal that the teachers whose civil status are separated and widowed find it more challenging to prepare performance tasks than whose civil status are single and married. In Goal, the mean rank for both separated and widowed is 41.00; in Role, the mean rank is 65.00; in Audience, the mean rank for both separated and widowed is 40.50; in Situation, the mean rank is 67.50; in Product, the mean rank is 53.00; and in Standards and Criteria for Success, the mean rank is 66.00.

Furthermore, in Standards and Criteria for Success, a Kruskal-Wallis H-Test shows that there is a statistically significant (α=0.049) difference in Standards and Criteria for Success across the other civil status (mean rank is 66.00 for separated). However, such difference was not observed for all other indicators or challenges such as Goal, Role, Audience, Situation, Product, and Standards and Criteria for Success. This illustrates that there is a significant difference in the preparation of performance task as perceived by the teachers whose civil status is separated in terms of Standards and Criteria for Success. However, the result does not affect the null hypothesis of the study as the p-value of all the other indicators are greater than 0.05: the p-value for Goal is 0.961; for Role, it is 0.110; for Audience, it is 0.973; for Situation, it is 0.097; and for Product, it is 0.459.

For this reason, based on the responses of the teachers, there is no significant difference between the challenges in the preparation of performance tasks in mathematics when the respondents were grouped according to civil status. This means that the indicator, Standards and Criteria for Success, does not affect the null hypothesis. Similarly, the results of the study of Andres, et al. (2021) states that the teachers' performance is unaffected by their civil status.

On the study of Odanga, et al. (2015), it was recommended that schools should employ counsellors in schools to help teachers deal with their psychosocial issues.

Table 11
Difference in the Challenges in the Preparation of Performance Tasks in Mathematics when the Respondents were Grouped According to Years in Service

Indicators/ Challenges		Mean Rank	p-value	Decision	Remarks
Goal	0-2 years	35.58	0.738	Fail to Reject H_o	Not significant
	4-5 years	35.39			
	6-8 years	37.11			
	9-11 years	32.81			
	12-15 years	32.88			
	15 years or more	43.55			
Role	0-2 years	39.58	0.936	Fail to Reject H_o	Not significant
	4-5 years	36.53			
	6-8 years	33.32			
	9-11 years	37.15			
	12-15 years	42.63			
	15 years or more	37.27			
Audience	0-2 years	34.83	0.763	Fail to Reject H_o	Not significant
	4-5 years	39.45			
	6-8 years	31.92			
	9-11 years	35.50			
	12-15 years	39.75			
	15 years or more	40.23			

Continuation of Table 11

Situation	0-2 years	33.83	0.225	Fail to Reject H_o	Not significant
	4-5 years	35.76			
	6-8 years	32.82			
	9-11 years	32.12			
	12-15 years	46.50			
	15 years or more	47.14			
Product	0-2 years	38.00	0.655	Fail to Reject H_o	Not significant
	4-5 years	37.76			
	6-8 years	32.95			
	9-11 years	33.04			
	12-15 years	45.13			
	15 years or more	40.59			
Standards and Criteria for Success	0-2 years	42.42	0.315	Fail to Reject H_o	Not significant
	4-5 years	34.66			
	6-8 years	31.71			
	9-11 years	33.35			
	12-15 years	44.63			
	15 years or more	45.50			

Present in the table are the mean ranks of the teacher-respondents in terms of their years in service. The results show that teachers who have been in service for 15 years or more find it more challenging to prepare performance tasks in terms of Goal, Audience, Situation, and Standards and Criteria for Success. In Goal, the mean rank is 43.55; in Audience, the mean rank is 40.23; in Situation, the mean rank is 47.14; and in Standards and Criteria for Success, the mean rank is 45.50.

On the other hand, teachers who have been in service for 12-15 years find it more challenging to prepare Role and Product in a performance task. In Role, the mean rank is 42.63, and for Product, the mean rank is 45.13.

In spite of the fact that teachers who have been in service for 15 years or more were more challenged in the preparation of performance tasks based on the results of the mean rank, there is no sufficient evidence that can prove that there is a significant difference in the challenges in the preparation of performance tasks in mathematics when the respondents were grouped according to years in service.

This implies that that there is no significant difference because the p-values are higher than the level of significance (α=0.05) on all the indicators or challenges: Goal has a p-value of 0.738; Role has a p-value of 0.936; Audience has a p-value of 0.763; Situation has a p-value of 0.225; Product has a p-value of 0.655; and Standards and Criteria for Success has a p-value of 0.315.

In relation to this finding is the study of Graham, et al. (2020) where the findings indicate that teaching quality for teachers has no significant effect by the years of experience, though there is some evidence of a decline in teaching quality for teachers with 4-5 years of experience. Findings imply that targeted support and evidence-based professional development would be beneficial to all teachers and that overall teaching quality might be raised.

Rich performance assessment tasks are becoming more prevalent as performance tasks provide students with more opportunities for learning to communicate and demonstrate their learning rather than writing a traditional assessment such as a paper-and-pen test. Compared to a conventional assessment, the goal behind a rich performance assessment is that students critically apply knowledge and skills to a new situation. Performance tasks not only use students' higher order thinking skills in Bloom's Taxonomy when they are able to apply and evaluate their knowledge, but also if students really understand something, they can work with it, analyze it, argue against it, and present it (Rich Performance Assessment Tasks, 2016)

Table 12

Difference in the Challenges in the Preparation of Performance Tasks in Mathematics when the Respondents were Grouped According to Highest Educational Attainment

Indicators/ Challenges		Mean Rank	p-value	Decision	Remarks
Goal	Bachelor's Degree	39.46	0.412	Fail to Reject H_o	Not significant
	Bachelor's Degree with Master Units	35.42			
	Master's Degree	30.17			
Role	Bachelor's Degree	38.04	0.252	Fail to Reject H_o	Not significant
	Bachelor's Degree with Master Units	37.21			
	Master's Degree	25.00			
Audience	Bachelor's Degree	36.83	0.232	Fail to Reject H_o	Not significant
	Bachelor's Degree with Master Units	38.04			
	Master's Degree	25.00			
Situation	Bachelor's Degree	36.87	0.527	Fail to Reject H_o	Not significant
	Bachelor's Degree with Master Units	37.45			
	Master's Degree	28.67			
Product	Bachelor's Degree	39.06	0.560	Fail to Reject H_o	Not significant
	Bachelor's Degree with Master Units	35.35			
	Master's Degree	32.50			
Standards and Criteria for Success	Bachelor's Degree	36.74	0.501	Fail to Reject H_o	Not significant
	Bachelor's Degree with Master Units	37.62			
	Master's Degree	28.17			

Table 12 exhibits the mean ranks of teacher-respondents in terms of their highest educational attainment. The results show that the teachers who possess Bachelor's Degree find it more challenging to prepare performance tasks in terms of Goal, Role, and Product: Goal has a mean rank of 39.46; Role has a mean rank of 38.04; and Product has a mean rank of 39.06.

Furthermore, the teachers who have Bachelor's Degree with Master's Units find it more challenging to prepare Audience, Situation, and Standards and Criteria for Success in a performance task: Audience has a mean rank of 38.04; Situation has a mean rank of 37.45; and Standards and Criteria for Success has a mean rank of 37.62.

Though it implies that teachers who have Bachelor's Degree only and Bachelor's Degree with Master's Units are more challenged in the preparation of performance tasks, still there is no significant difference because the p-value is higher than the level of significance (α=0.05) on all the indicators of challenges in the preparation of performance tasks in mathematics when the respondents were grouped according to highest educational attainment. The p-values are the following: for Goal, 0.412; for Role, 0.252; for Audience, 0.232; for Situation, 0.527; for Product, 0.560; and for Standards and Criteria for Success, 0.501. The p-values all fail to reject the hypothesis.

Hence, it can be inferred that there is no significant difference in the challenges in the preparation of performance tasks in mathematics in terms of GRASPS when the respondents are grouped according to their highest educational attainment. It is revealed in the study of Wendt, et

al. (2022) that teachers' educational attainment influences the quality of teaching including writing assessments in mathematics.

A lifetime learner teacher is keenly aware of the connection between learning and everyday life, understands the value of lifelong learning, is driven to participate in it, and possesses the essential intellect confidence and learning abilities. It is necessary for teachers and students to share authority over educational objectives and choices. With the introduction of information technology, it is urgently necessary to review not only the pedagogical approaches but also to keep teachers abreast of current trends. Utilizing a variety of innovative means of knowledge dissemination, the Lifelong Learning program seeks to close gaps in the learning and teaching process, regardless of the age of the individual learners (Dhaliwal, 2015).

4. GRASPS-Based Guide on Performance Tasks in Mathematics

The proposed GRASPS-based guide on performance tasks in mathematics is based on the most challenging among the indicators. For Goal, the statement, "I find it challenging to set an appropriate level of challenge" is the most challenging. To set an appropriate level of knowledge on performance tasks, the following can be taken into consideration.

1. Assess the WHAT
2. Construct direct and simple goals
3. Make the goal S.M.A.R.T.
4. Anticipate problems
5. Think about the scaffolding tools
6. Set a flexible time frame

For Role, the statement, "I find it challenging to provide roles within the task that allow learners to complete real-world applications of content" is revealed as the most challenging indicator. To provide roles within the task that allow learners to complete real-world applications of content, the following can be taken into consideration.

1. Identify career plans and ideals of the students.
2. Create the roles based on their career plans and ideals.

For Audience, the statement, "I find it challenging to provide an audience that can enhance the interest of the task and the nature of the assessment" is the most challenging among the indicators. To provide an audience that can enhance the interest of the task and the nature of the assessment, the following can be taken into consideration.

1. Identify the audience based on the role assigned.
2. Invite an authentic audience.

For Situation, the statement, "I find it challenging to identify a situation for varied learning styles" is revealed as the most challenging among the indicators. To identify a situation for varied learning styles, the following can be taken into consideration.

1. Know the different learning styles.
2. Identify the student's learning style.
3. Let the students work at their own pace.

For Product, the statement, "I find it challenging to design product or presentation to perform by learners using multiple intelligences" is the most challenging. To design products or presentations to be performed by learners using multiple intelligences, the following can be taken into consideration.

1. Know the multiple intelligences.
2. Identify a student's type of intelligence.
3. Construct a detailed plan of action.
4. Monitor student's progress.

For Standards and Criteria for Success, the indicator, "I find it challenging to inform learners how the assumed audience will evaluate their work" is exhibited as the most challenging. To inform learners how the assumed audience will evaluate their work, the following can be taken into consideration.

1. Include the rubric.
2. Explain to the students how they will be evaluated by the audience.
3. Ask for questions or clarifications from the students.

DISCUSSION

Based on the findings of the study, the following were drawn:

1. Majority of the teacher-respondents are female. The mathematics teachers' age ranges within 21-30 years old with the highest frequency followed by 31-40 years old. More than half of the mathematics teachers are married. The highest frequency among the years in service are the teacher-respondents that have been in service for 3-5 years and 6-8 years. Majority of the respondents are Bachelor's Degree holders taking their Master's units.
2. The challenges in the preparation of performance tasks in mathematics in terms of goal is challenging. On the other hand, the role, audience, situation, product and standards and criteria for success are found to be very challenging. The results shows that teachers encounter difficulty preparing their performance tasks.
3. The profile of the respondents in terms of gender, age, civil status, years in service, and highest educational attainment had no significant difference in the challenges in the preparation of performance tasks in mathematics. The responses from the teacher-respondents only showed that regardless of their profile, they are challenged in preparing their performance tasks in terms of GRASPS.
4. Based on the most challenging indicators revealed on Goal, Role, Audience, Situation, Product, and Standards and Criteria for Success, the GRASPS-based guide for performance tasks in mathematics is crafted and designed aiming to help teachers to develop authentic assessment and aid 21st century learners in developing metacognition.

For further improvement, other researchers may conduct a parallel study to evaluate the effectiveness of the output through the utility of the GRASPS-based guide performance tasks by mathematics teachers; to formulate a training program for teachers that focuses on preparing performance tasks in mathematics using the GRASPS model; to take into consideration the indicators used in determining the challenges in preparing performance tasks as a guide for possible innovation or creation of their own GRASPS-based guide performance tasks for other learning areas; and to consider other indicators or challenges that teachers encounter and that affects the preparation of performance tasks.

CONCLUSION

Revealed in this study was the most challenging indicators in preparing performance tasks in mathematics using the GRASPS model.

Thus, principals, administrators, and mathematics coordinators are encouraged to conduct more seminars and trainings on preparing performance tasks using GRASPS. The teachers are recommended to consider profiling of students in the preparation of performance tasks in terms of a goals that will inspire them to achieve the roles that they want to explore, audiences that they are interested in, situations that they want to be in, and products that they want to create.

Based on the most challenging indicators revealed on Goal, Role, Audience, Situation, Product, and Standards and Criteria for Success, the GRASPS-based guide for performance tasks in mathematics is crafted and designed aiming to help teachers to develop authentic assessment and aid 21st century learners in developing metacognition.

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