

Pedagogical Beliefs and Learning Assessment in Science: Teacher's Experiences Anchored on Theory of Reasoned Action

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ABSTRACT

Employing the phenomenological qualitative research design, this study explores the prevailing pedagogical belief and experiences of six secondary school teachers concerning their practices related to assessment of learning in science subjects among the public secondary school students in the Division of Cagayan de Oro City, Philippines. Anchored on the Theory of Reasoned Action (TRA) argument that additional factors, referred to as external, which in the case of this study pertain to pedagogical beliefs and mandate from the curriculum guide issued by the Department of Education, can influence the behavior of the teachers towards assessment strategy choices. This study has been done to verify whether external factors play a role with the teacher's behavior. Employing the directed content analysis, the data were analyzed in the framework of TRA. Employing the directed content analysis approach, findings of this study suggest that the assessment of learning practices of the teachers are shaped by their pedagogical beliefs, social norms and intentions. This study contributes to an understanding whether external factors directly shape the teacher's behavioral intention to carry out a certain assessment strategy to measure student's learning.

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Introduction

Teachers are empowered to decide how best to assess the students' learning. They may ask colleagues what their best practices are, read books about assessment or may even consult the Curriculum Guide for some suggestions on assessments. And with all information available to the teacher, a teacher will eventually make a decision which tool or form of assessment is the best one to carry out to evaluate students' learning. A good theory that explains how such behavior is formed is called the Theory of Reasoned Action (Martin Fishbein, 2008). *Assessment is one of the fundamental pillars in learning* (Saisana, 2008). *In fact, it is the heart of education as it serves to provide feedback which is then used to improve students' performance* (Metz et al., 2011; Wiliam, 2013; Gonzales & Callueng, 2014). With appropriate feedback about their learning, students become more involved in the *learning* process and they eventually gain confidence in what they are expected to learn based on a given standard of competencies and standards (Norton, 2009; Wiliam et al., 2010). Assessment in education must ultimately serve the goal of supporting learning (Eriksson, Boistrup, & Thornberg, 2018; Wiliam, 2013). The rationale why teachers carry out certain assessments for learning must be anchored on certain academic beliefs on assessment (Norton, 2009). However, Opre (2015) argued that that teacher's

conceptions about assessment is not strongly established hence there is a need to establish the link between the teacher's beliefs and practices. Scholars contend that there is a clear evidence that the teacher's beliefs about teaching, learning and curricula strongly influences how the teacher teaches and what the students can achieve (Ročane, 2015; Rozelle & Wilson, 2012). Furthermore, identifying the teacher's predominant belief about teaching and learning practices can pave a way for understanding the relationship between beliefs and student outcomes, thereby also provides insight into teachers' classroom practices such as instruction and assessment (Alejandro Galvis, 2012; Norton, 2009; Pajares, 1992).

Background of the Study

In the Philippine education context, formal assessment started as a mandate from the government to look into the educational status of the country. In relation to educational assessment practices in the country, assessment is given emphasis due to the demand for quality assurance in schools, especially in teaching and implementation of programs (Magno, 2010). With the advent of the conceptualization of the 21st century skills, assessment is purposive such that learners are expected to develop the skills needed for them to thrive in the 21st century era (Reyes, 2010). However, the teachers are still confined to the paper and pencil test. They have not yet fully embraced the forms of alternative and authentic assessments such as portfolio, performance, and product-based assessments in their classroom instruction. Due to issues of reliability and validity of the teacher-made paper-and-pen tests, teachers oftentimes are in a dilemma whether or not they are giving their students appropriate tests (Cepni et al., 2012; Lasaten, 2016).

The primary purpose of assessment among Filipino teachers is to formally document growth in learning, rank students based on their class performance, determine the final grades of the students and provide information to the central administration. The main source of assessment tools is test items developed by the teachers themselves (Balinas, 2016). Teachers are expected to be skillful in collecting information about the performance of their students in school. However, assessment problems are particularly prominent in performance assessment, interpretation of standardized test results, and grading procedures. Teachers also are less aware of the pedagogical, managerial and communicative aims of classroom assessment (Gonzales & Callueng, 2008).

Problem Statement

From the existing literature, it is evident that much has been discussed about how assessment in the classroom is chosen and implemented (Birenbaum et al., 2015; Wiliam, 2018). However, investigations specifically concerning what drives the teacher to choose certain assessment strategy to measure students' learning, specifically in a Science class seems limited (Bryan, 2012; Barnes, Fives, & Dacey, 2014). It is therefore the purpose of this study to explore and make sense of the teacher's pedagogical belief and lived experiences regarding their assessment for learning practices in their teaching-learning work.

The goal of this interpretative phenomenological qualitative study was to explore, based the perspectives and experiences of the lecturers, whether their pedagogical belief plays a role in the selection, adoption and use of certain assessment tools and methods in their teaching-learning activities. In order to meet the research objectives of this study, the following research question was sought to be answered:

- a. How do the secondary school teachers from the Department of Education in Northern Mindanao, Philippines describe their pedagogical beliefs in assessment of learning?
- b. What are the teachers' practices in the assessment of learning in their Science class?
- c. How do these teachers' experiences shape their actual behavior in assessment activities in terms of their pedagogical beliefs, social norms, and behavioral intention?

Literature Review

The Theory of Reasoned Action

The Theory of Reasoned Action emphasizes that a person's behavior is determined by attitude toward a behavioral outcome and public opinion. This theory was coined by Fishbein & Ajzen, (1975) saying that behavior is influenced by intention to shape the behavior and the intention is a function of attitude of behavior and subjective norm.

The Theory Reasoned Action is built out of three constructs. The first one is the attitude towards act or behavior. This refers to an individual's belief of a certain behavior or act makes a positive or a negative contribution towards a person's life. In the case of assessing student's learning, for example, it means that a teacher either believes that a certain type of assessment makes sense for the students or not, or which type of assessment makes sense for the teacher. The second construct is called subjective norm. This construct focuses on everything around an individual. To elaborate, it could be the school principal, the teacher's colleagues, the cultural norms, the curriculum guide, the group believes and so on. Back to the assessment of student's learning, a teacher may have already had an opinion or have formed a belief as to what others think about the best form of assessing student's learning. And that belief, again, influences the teacher's decision. The third construct is called behavioral intention. This construct expresses a person's intention to a certain behavior or act in a certain way. In the context of assessing student's learning, a teacher might form an opinion on how easy or hard it is to carry out a certain type or form of assessment (Martin Fishbein, 2008).

According to this theory, beliefs influence the attitude which also influences the behavioral intention, and this often leads to the actual behavior. It also has external factors such as the subjective norm which refers to the belief about the social desirability of a behavior, whether it is something that people view as acceptable. What this theory predicts is that a positive attitude towards an act or behavior and a favorable social norm are the best predictors for performing a behavioral intention, and in turn lead to a displayed behavior or act. In other words, the theory predicts that if a teacher thinks that a certain type or form of assessment is the best way to assess student's learning, and everyone else thinks that it is a good idea, and the teacher believes that he/she can actually handle it, the teacher will carry out that particular form or type of assessment to evaluate student's learning (Montaño & Kasprzyk, 2015).

However, if one of the theory's constructs is unfavorable to a teacher, for example, if a teacher thinks that it does not make sense to him/her to carry out a certain form or type of assessment, or if the teacher thinks that it is not a good idea, or if the teacher thinks that he/she will be out of his/her comfort zone carrying out the form or type of assessment, the teacher is much more likely not to carry out a particular form or type of assessment, and the likelihood decreases if two or even three out of these constructs are unfavorable (Bryan, 2012).

Classroom Assessment

Assessment is one of the key factors for determining the success in learning. Türkdoğan and Yildiz (2021) emphasized that the teachers' immediate feedback to the students' mistakes in learning is a determinant to the success of students' academic performance. Teachers can enhance or destroy students' desires to learn more quickly and permanently through their use of assessment than through any other tool at their disposal (Harlen, 2011). Classroom assessment refers to the process teachers use to grade student subject assignments, standardized testing imposed on schools, any activity designed to collect information to be used as feedback to modify teaching and learning activities, or a way to improve instruction and students' performance (Gonzales & Callueng, 2008). It is also described as *"those assessments where the main decisions about what gets assessed, how the students will be assessed, and the scoring of the students' responses, is undertaken by those who are responsible for teaching the same students. Externally produced assessments could be regarded as classroom assessments if the decision about whether to use*

those assessments, how to administer them, and how to score them rested with the teacher" (Black & Wiliam, 2018, p. 554).

It is natural for teachers and students to aim for high performance, but when it is measured by external tests and when the results are accompanied by penalties for low performance, the aim becomes to perform well in the tests. The impact that assessment can have on students can be either positive or negative. What happens depends on how the teacher mediates the impact of assessment on students. When teachers set their role as helping students to pass tests, by whatever means, their teaching methods and experiences of the students are distorted. The alignment of assessment, curriculum and pedagogy is more easily upset by changes in assessment and this has to be taken into account in designing assessment policy.

Black & Wiliam (2018) quoted Lee Cronbach (1971) stating that *"an assessment is, at its heart, a procedure for making inferences: 'One validates, not a test, but an interpretation of data arising from a specified procedure'* (p. 447, emphasis in original)." He therefore argued that an educational assessment is a procedure intended for making inferences about student learning. As learners engage in certain tasks, they produce certain data. These data, then, can become evident when they are utilized to support particular claims.

Looking at assessment from this point of view, it can be deduced that the difference between formative and summative lies in the kinds of inferences being generalized from assessment results (Wiliam, 2011). Where the inferences relate to the status of the student, or about their future potential, then the assessment is functioning summatively. Where the inferences relate to the kinds of actions that would best help the student learn, then the assessment is functioning formatively (Black & Wiliam, 2018). Hence, classroom assessment must be carefully planned from test planning to reporting to utilization of test results (Gonzales & Callueng, 2008).

Pedagogical Belief

Pedagogical beliefs refers to "teachers' educational beliefs about teaching and learning and the beliefs they have about how technology enables them to translate those beliefs into classroom practice" (Ertmer, 2005, p. 28). In educational settings, pedagogical belief is defined beliefs as "one's convictions, philosophy, tenets, or opinions about teaching and learning." As such, teacher beliefs may include subjective theories about how students learn, what a teacher should or should not do, and which instructional strategies work effectively. Teacher beliefs about learning and teaching have been found to shape teachers' practices, for example, the choice of priorities for teaching arrangements and the ways in which teachers want to facilitate learning (Ertmer, 2005; Kagan, 1992).

The concept of pedagogical belief is tied up with specific teaching practices. Examples are transmissive belief which emphasizes on the transfer of skill and knowledge from teacher to students; while constructive belief is anchored on the philosophy that focuses on the importance of how the instructional content can be meaningful to the learner's everyday life experiences (Liu et al., 2017). The teacher's pedagogical beliefs, which influences their pedagogical reasoning, are essential determinants of the learning outcomes, and therefore necessitates that teachers need to undertake more pedagogical reasoning in the planning of their assessment for learning activities in order to integrate adopt and use appropriate assessment tools and methods (Koh, Chai, & Tsai, 2010; Kreijns, Van Acker, Vermeulen, & Van Buuren, 2013). Furthermore, literature showed that employing different assessment of learning formats (Sari et al., 2020) springs from the belief and knowledge of the learners' different learning styles (Kanli & Ilcan, 2020).

Methods

Research Design

This qualitative study utilized a constructivist-interpretivist perspective particularly the phenomenological research design. Qualitative method of inquiry is aimed at exploring or

understanding the meaning that individuals or groups attribute to a social or human phenomena, and takes into account an inductive style of research (Creswell, 2012). A phenomenology is an approach to qualitative research that describes the meaning of a lived experience of a phenomenon for several individuals (Ary et al., 2010). The phenomenon in this study is the teaching experience of using technology in the classroom activities in lined to the participant's pedagogical belief. In addition, interpretivism, puts emphasis with the meanings of human experiences (Gray, 2004). The constructivist perspective stresses that the worldview that an individual person develops is variable and bears a subjective meaning of their experiences, and is this meaning is in the context of the environment with which they work or live (Creswell, 2012). It is for this reason that constructivist researchers will look for the lived experiences of human subjects as they investigate personally constructed meanings about the participant's broad concepts, or more specific issues or ideas (Creswell, 2012; Gray, 2004).

Participants

In approaching this study, six secondary school teachers employed as public secondary school teachers in the Department of Education from Northern Mindanao, Philippines participated. The purposive criterion sampling was used to identify the participant who has experienced the phenomenon. This method of sampling helps to create a homogenous sample of participants who have all experienced the phenomenon (Creswell, 2012). The criteria for selecting the participants were as follows: they must (1) be a regular secondary school teacher of the Department of Education (2) be teaching Sciences subjects (Integrated Science, Biology, Chemistry or Physics); and (3) have been teaching Science subject for at least five years to have the full grasp of the curriculum. The criteria for choosing the participants of this study were based on the Department of Education Order No. 7, series of 2015. Any faculty member/teacher who did not teach any of the courses mentioned above were not qualified to be respondents of this study. In addition, the maximum variation technique of purposive sampling was employed in this study. In this sampling technique, the participants are included that maximize differences on specified characteristics (could be in age, subject taught or number of years of teaching experience). This type of sampling reveals differences, but may also identify commonalities across the units (Ary et al., 2010; Palinkas et al., 2015). Table 1 shows the demographic profile of the participants.

Table 1

Demographic Profile of the Participants

Name	Age	Years in teaching	School Assignment/ Subject Taught	Academic Qualification
Allan	36	13	"C" National High School Physics	PhD Graduate
Beth	42	20	"A" National High School Chemistry	PhD Candidate
Dee	38	7	"B" National High School Integrated Science	Masters candidate
Lyn	47	10	"A" National High School Chemistry	PhD Candidate
Marlon	41	18	"C" National High School Physics	Masters Candidate
Raffy	33	10	"B" National High School Biology	Masters Candidate

Sampling Technique

The participants for this study were chosen purposively. Purposive sampling technique is a non-probability sampling technique wherein the participants are selected based on the characteristics of a population and the objective of the study. In the case of this study, the participants were purposively chosen as they are the respondents which can best provide the data, and thereby satisfy the information needed for this study. In addition, Saunders et al, (2009, p. 213) pointed out that purposive sampling is likewise employed when “each case being selected from the total population is not known.” In the case of this study’s respondents, the list as to how many lecturers are available. However, the list of the individual lecturer’s name is not available as this is held confidential by the department of Human Resource. More specifically, the technique employed was a maximal variation strategy (Ary et al., 2010; Creswell, 2012; Palinkas et al., 2015). This technique is used to capture a broad range of viewpoints relating to the acceptance and use of technology among the respondents. This would further mean that the maximum variation sampling is a search for differences in perspectives, ranging from gender, age, experiences, behaviors, and types of educational technology tools being used in the context of teaching-learning activities. The primary principle underlying heterogeneous sampling is to gain greater insights into a phenomenon by looking at it from all angles (Saunders et al., 2009). Moreover, the goal of this study is not to generalize the findings to the general population but to generalize the findings to the TRA model. Recruitment of research participants stopped when the data saturation had been reached (Francis et al., 2010).

Data Collection

The data for this study were collected using an open-ended survey questionnaire sent to the participants online. Any answer that the participants gave that needs probing, was asked in more details using voice calling with the participants through messenger. A semi-structured interview protocol was developed by the researcher, reviewed by two qualitative study experts, and edited based on feedback. The purpose of the semi-structured approach is to allow comfortable interaction among participants, thereby enabling the respondents to provide detailed stories of the experience or phenomena under study (Donlan, 2016). This data collection method was employed because, according to scholars, in cases where literatures are hard to find to support a concept in a study, understanding people’s perceptions is necessary to establish how and why people respond to certain issues or phenomena (Oliveira et al., 1998).

The online interviews were conducted by the first author. Document analysis through the curriculum guide and lesson plans were also carried to triangulate the participant’s claim of their assessment strategy. Each participant was interviewed mostly on weekends where their conversation will not hinder their job-related tasks. During the data analysis, new questions arose, which led to additional interviews with the participants. These interviews were supplemented document analyses of the teacher’s lesson plans. The interviews were conducted in both Cebuano (the regional dialect in Northern Mindanao) and in English. After the transcription of the interview dialogue, coding and analysis were carried out.

During the online interview, the questions raised were pertaining to the participant’s perspective, beliefs and experiences regarding their choice of assessment strategies and based on their pedagogical beliefs in their teaching-related activities. The online interview was conducted between November 10 to December 10 in 2018. A voice recorder was used to record the conversation to make the discussion flow uninterrupted. The questions asked are presented in Table 2.

Table 2

Focus Group Discussion Protocol Questions

To explore broad experiences
<ol style="list-style-type: none"> 1. Please describe your pedagogical belief as a teacher. 2. How does your pedagogical belief influence your assessment of learning strategies? 3. What is/are your usual assessment strategy/ies that you use to monitor the progress the achievement and learning of your students in Science? 4. How do you select and implement your strategy/method of assessment? 5. Which Science process skills does the Department of Education Curriculum Guide give more focus on? 6. What assessment method is given to these process skills? 7. What are your criteria/belief/philosophy for choosing the assignment method/strategy? 8. Why do you choose such assessment method/strategy? 9. How appropriate is your method of assessment strategies in stimulating skills related to 21st century learning? 10. What assessment tools do you use in your authentic learning assessment?
To explore and generate more detail about specific experiences:
<ul style="list-style-type: none"> • Tell me more about that... • Can you give me an example? • I want to understand what you mean. • Can you tell me again? • Why do you think that is?

Data Analysis

The data analysis took place in accordance with the directed content analysis approach. This approach is applicable where “an existing theory or prior research exists about a phenomenon that is incomplete or would benefit from further description” (Hsieh & Shannon, 2005). The objective of a directed approach to qualitative data analysis is to corroborate or conceptually outspread a theoretical framework, a theory or a model under study. The existing theory or model can greatly help as it provides facilitation on formulating the research question as well as in the data analysis. It further provides help in predicting about the variables, or even identify the relationships among variables, thereby enabling to determine the initial coding system or patterns between and among codes. Contrary to the approach in qualitative other data analysis, this is referred to as a deductive category application (Mayring, 2007). This approach of qualitative data analysis is directed by a more controlled procedure compared to a conventional approach. This approach uses existing theory or prior research, allowing the researcher to begin by identifying important concepts or variables as initial coding groups. Consequently, each category that was identified are operationally defined using the theory (Hsieh & Shannon, 2005).

To be able to code the online interview result, the interview transcript was transcribed into English language. The transcription was cross checked by two English lecturers from the dialect used in the discussion in English language. To ensure authenticity of the data, a thorough analysis was done on the transcript before progressing to the coding process. The transcript was read and reread. Only after the researcher has been fully immersed with the transcript, the codes were created. The transcript was coded manually, line by line. Manual coding was feasible as there were only six participants of the study. Initially, 39 separate codes that were generated, but these were later condensed into five categories and subsequently three themes emerged, all of which fall under the core constructs of the Theory of Reasoned Action Model. Moreover, statements from the participants were quoted as they were provided during the open-ended survey and video calls. Table 3 presents an excerpt of the data analysis.

Table 3

Excerpt of the Thematic Data Analysis

Narratives	Codes	Categories	Themes
Students learn more when they are empowered to discover and do things you want them to learn, hence, their learning is lasting compared to the traditional way of teaching	empowered	Student-Centered Activities	Pedagogical Beliefs
To engage students into real-life situations	engaged		
By providing students with collaborative learning activities, cooperative learning activities, inquiry-based learning	Critical thinking		
Every learner has his own way of learning.	individualized		
A teacher should have to consider a differentiated form of instruction as an approach in addressing the diverse learners	differentiated	Differentiated Learning Strategies	Social Norms
Assessment tools must be designed to help students develop holistically	Holistic development		
Students are not only skilled, but also developed holistically	Developed holistically		
Employed different methods and strategies in teaching science in order for the students to be equipped and be ready for the 21 st century needs	Equipped	Outcomes Evaluation	
Adopt and use certain assessment tools, methods or strategies because I believe that those tools could measure authentic learning among students.	Adopt and use	Motivation to Comply	Social Norms
Use different methods and strategies in teaching so that the students can be equipped and ready for what our society facing today.	Equip students		
The push to comply is not necessarily from the top administrators.	Not from administrators	Subjective norms	
The motivation to implement assessment is seen in the need of the students	Student's needs		
The belief is driven by the fact that students learn in different ways.	Learning styles	Diverse assessment	Behavioural Intention
It's not so much as to the type of assessment method used, rather how the assessment method is made to fit the mold of being a constructivist type of a teacher.	Appropriate assessment		
The intention to use certain tools certainly determines the actual use of the same.	Intentionality	Intentional assessment	
I believe that these certain assessment tools can help me gauge if my students really learned what they should be learning.	Alignment of belief to practice		

Ethical Considerations

In conducting qualitative research, it is essential that the participants of the study were protected, and that data kept confidential. In accordance with ethical guidelines in conducting research, the researcher has carefully followed the ethical principles and guidelines as recommended by Walliman (2011). The researcher obtained informed consent from all participants in the study. They were also informed that they had the option of withdrawing from the study at any time. In order to ensure confidentiality of the participants, all participants, and schools and locations have been given fictitious names in transcriptions.

Findings and Discussions

This study aimed to understand the essence of lived experiences of secondary teachers in their assessment of learning in their science classes as driven by their pedagogical beliefs. The themes that emerged during the data analysis correspond to the aspects that shape the teachers' assessment practices. These aspects include: pedagogical beliefs, social norms, and behavioral intention. Each theme is characterized by categories which are explained in this section.

Theme 1: Assessment Practices as Shaped by Pedagogical Beliefs

During the online interview, the teachers how they carry out their pedagogical beliefs into their teaching-assessment activities. Two categories emerged: student-centered and differentiated learning activities.

Student-centered Activities

Dee said that his "pedagogical belief is to engage students into real-life situations through different methods and strategies used in teaching science." With this, Lloyd agreed by saying that "I need to consider their (the students') individual needs." Lloyd further narrated that he carries out his belief by "providing students with collaborative learning activities, cooperative learning activities, inquiry-based learning." From many years of teaching experience and observations, Merlyn realized that "students learn more when they are empowered to discover and do things you want them to learn, hence, their learning is lasting compared to the traditional way of teaching."

Differentiated Learning Strategies

Another theme that emerged about the teachers' pedagogical belief is meeting the various learning needs of the students. Marlon narrated that "every learner has his own way of learning. He has unique ability to grasp the concept of the lesson. He has also unique capabilities in learning,' hence, he added that "a teacher should have to consider a differentiated form of instruction as an approach in addressing the diverse learners." Beth also shared that she is trying to "implement the constructivist's method" because it is mandated that a teacher must use this teaching pedagogy. Raffy shared that he a constructivist type teacher. However, certain topics and lessons demand that he should also play the role of a transmissive teacher for the "sake of the teaching-learning process." In addition, he said that his beliefs will also depend on the "type of learners." Nonetheless, Raff added that assessment of learning must be designed to "help students develop holistically. "this can be achieved when teachers chose assessment tools that "encompass the affective aspect of the students. It should be something that teaches or touches their humanity and or spirituality of the student.'

It was clear from the insights shared by the participants that they believe that when students are engaged in the learning process, including the assessment of the learning process, students learn the skills more and hence they are able to apply these skills especially in the 21st century era. Based on the

information shared by the participants, it can be gleaned that the nature of students, who are digital natives, necessitates that the teachers must also shift from conventional to a more constructive approach of teaching. According to Black & Wiliam (1998), for educators to successfully incorporate assessment for learning into classroom practice they need to reflect on their teaching philosophy, their assessment pedagogy and the alignment between the two. Bryan (2012) emphasized that assessment for learning must be based on the premise that all students are capable of achieving and have unlimited learning potential. With the right information and sufficient motivation all students can succeed in school. This contrasts with beliefs about fixed intelligence quotient (IQ) limiting learning capacity of students (Khan, 2019) to varying degrees, which has governed teaching pedagogy for many years.

Theme 2: Assessment Practices as Shaped by Social Norms

When asked how the influences around the teacher shape their assessment of learning practices, two categories emerged from the participants' responses: outcomes evaluation, and motivation to comply.

Outcomes Evaluation

Aside from the pedagogical beliefs that propel the teacher to choose certain forms of assessment, the teachers are also motivated by the possible outcome of the students' learning. Dee divulged that he "employed different methods and strategies in teaching science in order for the students to be equipped and be ready for the 21st century needs." With this, Beth also shared that by employing skills-based assessment tools, it "helps prepare the learners as 21st century workers." Raf also mentioned that it is essential that "students are not only skilled, but also developed holistically" because the assessment tools that teachers implement in their classrooms are ones that "should be something encompasses the affective aspect. It should be something that teaches or touches their humanity and or spirituality of the student," said Raf.

In the Philippines, the Outcomes-Based Education (OBE) is strongly adhered to both by the Department of Education (DepEd) (DO 73, s. 2012) and the Commission on Higher Education (CHED) (Llanes, 2018). These two agencies are responsible for supervising and monitoring the basic and the higher education respectively. Hence the mandate of the Curriculum Guide issued by the Department of Education is a strong support for helping the teachers in designing their assessment activity. Although the suggestions for assessment in the Curriculum Guide is mandatory, but teachers are empowered to adopt and use whatever best assessment tools (Macasaet, 2002) that are available either from colleagues or from the internet in order to help students in their learning.

Motivation to Comply

Another category is the motivation to comply. refers to do what salient referents think an individual should do. This construct contributes to subjective norms along with normative beliefs. In the case of this study, the participants believed that they should gear their teaching-learning strategies towards the constructivist perspective because it is how the students can best develop the skills needed for the 21st century. Dee mentioned that it is through "different methods and strategies used in teaching" that the students can be "equipped and ready for what our society facing today." Allan also mentioned that by engaging students into "collaborative learning activities, cooperative learning activities, Inquiry based learning," the teachers are actually equipping the students with the soft skills needed for the 21st century era. He further narrated that he is driven to adopt and use certain "assessment tools, methods or strategies because I believe that those tools could measure authentic learning among students."

Gauging from the participants' responses it can be gleaned that they are motivated to comply with the directives provided by the Department of Education because the vision of the department also adheres to their beliefs in teaching. The motivation of the teachers does not only come from the

directives of the department, but as well as to the holistic well-being of their students. This motivation argues against the testing systems in the West which tend to focus on linear measurement of cognitive functions. This practice can be seen in Alfred Binet's (Kite, n.d.; Cicciola et al., 2014) testing to identify those who did not meet certain standards. Such assessment served the goals of mass education and the need to identify elite, highly specialized learners. At its core, this type of assessment focuses upon those who excel academically, while the losers will tend to feel being at the far end of the spectrum (Daniel & King, 1998; Schafer & Lissirz, 2005). And it is sad to say that this same observation is still true for most schools today. This linear testing system became the norm in schools and universities, alike. And the power in the classrooms lay with the teacher rather than the student. Because of these issues, more holistic approaches, such as Gestalt - where the whole person was considered more than the various parts - have been discarded (Alberta Ministry of Education, 2006). This philosophy is adhered to by the participants of the study. They are motivated that, with appropriate assessment tools, the students will be trained holistically.

Subjective Norms

Subjective norms refer to the belief that an important person or group of people will approve and support a particular behavior. Subjective norms are determined by the perceived social pressure from others for an individual to behave in a certain manner and their motivation to comply with those people's views. The influence of subjective norms on forming intention proved to be generally weaker in previous studies than the influence of attitude (Ham et al., 2015). To support this concept, the participants shared the fact that the nature of the students are digital natives, they felt that they should meet where their students are at. The push to comply is "not necessarily from the top administrators", such as the school principal or the subject coordinator, but that it is the seen "need of the students," says Marlon. As mentioned by the participants of this study, their adoption and use of certain assessment method and strategies are, one way defined by the curriculum guide and their own belief that which is best fitting to the need of the child to learn and to develop the Science process skills.

This finding adheres to the study of Renihan & Noonan (2006) when they found out that "principals viewed assessment as a matter of teacher accountability and as a focus for the school professional team. They saw themselves as teachers first, stressing their importance as sources of teacher support, serving a 'buffer role,' ameliorating external constraints to effective assessment and learning." This implies that the school principals empower the teachers regarding the choice in assessment as long as it serves the purpose of helping the students learn the concepts and skills (Macasaet, 2002).

Theme 3: Assessment Practices Shaped by Behavioral Intention

Behavioral intention (BI) is defined as a person's perceived likelihood or "subjective probability that he or she will engage in a given behavior." Ajzen (1991) defines this construct as "a user's readiness to carry out a particular behavior." In the vein of the participant's perspective, they shared that their belief towards students designing and discovering their own learning through non-conventional methods of teaching and assessment has eventually influenced their behavior to employ constructivist-approach methods of assessment. Although there were many times that they can't do away with using paper and pen test, especially during the summative exams, their formative assessments are more often into performance and authentic assessment. Marlon shared that his "intention to use certain tools certainly determines his actual use of the same" and he justified his argument by saying that he "believes that these certain assessment tools can help me gauge if my students really learned what they should be learning." He further added that the assessment tools that he uses is "dependent on the kind of students that I have and on my strategies in teaching. I have been using the discovery method in Science for a long period of time already and I have found out that this is highly effective in my Science class." Merlyn also agreed with this contention by saying that she often "gives activities that will allow students discover by themselves the concepts I want them to learn." Allan agreed with this line by

saying that his “pedagogical belief influences my attitude towards my assessment method because I believe that this approach is appropriate for my students.” This, he added that his belief is driven by the fact that “students learn in different ways. I also believe that they vary in their beliefs, ability, culture, personality, behavior, and even views and opinions. Those are my ways.” Raf also added that “It’s not so much as to the type of assessment method used, rather how the assessment method is made to fit the mold of being a constructivist type of a teacher.”

It can be deduced from the participant’s responses that their beliefs and the motivations they get – either from their department, their colleague or from the students, concretely help them in developing the right attitude towards adopting and using appropriate assessment tools and methods. This claim agrees with the findings of Fishbein & Ajzen (1975) emphasizing that the attitude of a person, whether favorable or non-agreeable, determines his behavioral intention to carry out such an attitude. The report of Szumowska et al. (2018) agrees to the theory by stressing that the high goals of an individual, in the case of this study is the holistic development of the student, motivates the teacher to comply with the constructivist tasks of assessment expected of them.

Theme 4: Assessment Practices

This theme describes the actual implementations of assessment of learning practices of the teachers in their Science classes Actual behavior is defined as an individual’s intention to perform a behavior which is a function of attitude towards behavior and subjective norms (Agudo-Peregrina et al., 2014). The participants have very clear and distinct description of how they carry out their methods of assessment in line to their beliefs and attitudes. The different forms of assessments that they mentioned they are employing, based on their pedagogical beliefs, are summarized in Table 4.

Table 4

Forms of Assessment Implemented by the Secondary School Science Teachers

Pedagogical Belief	Formative Assessment	Summative Assessment
Conventional	<i>Paper and pen quizzes</i> <ul style="list-style-type: none"> • Weekly reflections • Daily/weekly quizzes 	<i>Paper and pen tests</i> <ul style="list-style-type: none"> • Quarter examinations • Chapter and long tests
Constructivist	<i>Project-based assessment</i> <ul style="list-style-type: none"> • Create video clips related to the topics <i>Performance assessment</i> <ul style="list-style-type: none"> • Group reporting/oral presentations, oral reports • Performance tasks evaluated with the use of rubrics • Problem-solving • Concept mapping • Use of rubrics <i>Problem-based tasks</i> <ul style="list-style-type: none"> • Students are given a problem setting to solve and they will be assessed using rubric <i>Other alternative assessments</i> <ul style="list-style-type: none"> • Use of rubrics for alternative assessment • Oral questioning • Debate 	<i>Project-based assessments</i> <ul style="list-style-type: none"> • Creation of 3D manipulative objects <i>Performance assessment</i> <ul style="list-style-type: none"> • Group video presentations showing real-life situations involving scientific concepts • creating replicas with a twist, fusing science concepts with other disciplines • Use of rubrics <i>Portfolio</i> <ul style="list-style-type: none"> • Compilation of ISNs as terminal project • Compilation of capstone activities which need to be submitted at the end of the quarter • A compilation that contains the works of the learners and will show their growth or lack thereof over time

From the teachers’ sharing of their experiences regarding their adoption, selection and use of certain assessment tools and methodologies, it can be gleaned that their actual use of certain assessment tools is so driven by their pedagogical beliefs, hence they tend to use more of authentic, performance-

based and alternative learning rather than the rote-based paper and pen quiz. It can be deduced that the participants' behavioral intention shapes their actual behavior. These results agree with the findings of Venkatesh Morris, Davis, & Davis (2003) and Fishbein (2008) which strongly held that the behavioral intention is significant predictor of the actual action of a person. The teachers in this study claimed that if they really want to use certain assessment tool because they believe it is helpful in the development and learning of the student, then they will certainly use it.

Conclusions and Recommendations

Through the Theory of Reasoned Action (TRA), this research inquiry was able to validate how the assessment practices such as adoption, selection and usage of assessment tools and methods in gauging the students' learning of secondary school Science teachers are shaped by their pedagogical beliefs, social norms and behavioral intention. The gathered data served as a form of confirmation of the theoretical model of TRA (Fishbein, 2008).

The findings of this study can provide avenues for future research. This study highlights that pedagogical belief plays a vital role in the teachers' adoption, selection and use of certain assessment tools and methods. It would be beneficial, through an alternate approach and different theoretical lens, to continue exploring ways that lecturers experience or describe the process of integrating assessment of learning into their teaching and learning practices. Educators could benefit from studies that consider the integration of specific technological tools on specific training initiatives, as information on these issues could help direct appropriate teaching methods and strategies based on a teacher's pedagogical belief. Studies that explore or investigate the role of technology in the teacher's pedagogical belief in their assessment practices should not be limited to qualitative work that delves into the lecturer's experiences or perspectives.

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