

Maintaining a Constructivist Classroom : Experiences and Challenges of Senior High School Teachers in the STEM Strand

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Abstract: *The K to 12 Program of De La Salle Lipa, which is implemented two years ahead of mass implementation, was spearheaded by the College of Education, Arts and Sciences because most of the General Education Courses (GEC) are now incorporated in the new Senior High School Curriculum. This created great impact among College teachers who are assigned to teach in the Senior High School (SHS) during the transition period because who they encountered many challenges on the rudiments of teaching and learning using constructivist framework. Thus, this qualitative research explored the experiences of Senior High School Teachers in the STEM Strand to serve as indicators for each principle of maintaining a constructivist classroom. Likewise, challenges accompanying experiences were also identified. Moreover, an action plan is proposed on how teachers can maintain a constructivist classroom. Twenty-two full –time and part – time College teachers who taught and currently teaching in the SHS participated in the face to face focus group discussion. Framework analysis was used in the analyzing qualitative data. Based on the findings, the experiences of the teachers involved in the conduct of this study can be considered as indicators of each of the principles of maintaining a constructivist classroom. Likewise, challenges accompanied each of the experiences of the teachers. An action plan is forwarded to maintain a constructivist classroom.*

Key Words: *Constructivist classroom, experiences, challenges, Senior High School teachers.*

1. INTRODUCTION:

The implementation of the Republic Act 10533 also known as Enhanced Basic Education Act of 2013 of the Philippines is in response to harmonization of qualifications of the workforce in Asian region. Through its implementation, graduates of this program will attain mobility and competitiveness across the world. However, challenges abound specifically on the nature of its successful implementation. The K to 12 Program of De La Salle Lipa which is implemented two years ahead of the mass implementation was spearheaded by the College of Education, Arts and Sciences through the Dean because most of the General Education Courses (GEC) such as Physical and Biological Sciences, Communications Arts in English and Filipino, General Mathematics, Statistics, Society and Culture are now incorporated in the new Senior High School Curriculum. This has great impact for the College faculty members handling the aforementioned courses especially during the lean years in which no one will enroll during the first two years of mass implementation of the program. Thus, it was the administration's decision to keep the full – time and part – time teachers and assigned them to handle those subjects in the Senior High School (SHS) considering their expertise during the transition period and are expected to go back to their home department once the enrollment becomes stable. With this decision of assigning College faculty members who are content experts to teach core, specialized and applied subjects in the Senior High School during the transition period, De La Salle Lipa as an institution of higher learning has the assurance that the goal of SHS curriculum which is to develop competent learners who demonstrate content and performance masteries and manifest 21st century skills such as critical thinking skills and doing, creativity, collaboration, cross – cultural understanding, communication, computing or ITC literacy and career and learning self – reliance will be attained. Thus, students will experience deep learning which according to Fullan and Langworthy (2014), the goals of deep learning are that students will gain the competencies and dispositions that will prepare them to be creative, connected, and collaborative life-long problem solvers and to be healthy, holistic human beings who not only contribute to but also create the common good in today's knowledge-based, creative, interdependent world. These statements which can be achieved through authentic assessment are confirmed by McKenzie (2002) that the construct, authentic learning, is a measure of a curriculum's relevance or appropriateness to the world that graduating students will enter.

It cannot be denied that faculty members in the College Department assigned to teach in the SHS attained content mastery and some of them are licensed teachers or earned Education units. However, teachers encountered many challenges during the first two years of early implementation of SHS program specifically on the rudiments of teaching and learning that makes use the constructivist framework. Constructivist framework states that the curriculum shall use pedagogical approach that is constructivist, inquiry – based, reflective, collaborative and integrative. This

approach puzzles College teachers on how they can manage teaching and learning process using this framework. After acknowledging the inadequacy of teachers' background on how to apply constructivist framework in the classroom, Senior High School teachers think that they should start with the usual routine in the classroom to meet the content and performance standards set by the Department of Education of the country. Thus, teachers should resort to constructivist teaching which is based on the belief that learning occurs as learners are actively involved in a process of meaning and knowledge construction rather than passively receiving information (Gray, 2016). Many authors believe that constructivist-teaching strategies are the next important step in educational reform (Powell and Kalina, 2016). Based on literatures reviewed, nothing gives idea on how to maintain a constructivist classroom. Most of them explained constructivist theory. Only the article Concept to Classroom (2016) enumerated five principles of maintaining a constructivist classroom. However, this article does not give any explanation or indicator for each principle. Thus, SHS teachers go on with the usual classroom routine of preparing the syllabus, course outline and modules as well as how to deliver them in what they believe as constructivist approach and how to assess and evaluate teaching and learning process. With all the things cited above, the researchers explored the experiences and challenges encountered by the College faculty members who are assigned to teach core, specialized and applied subjects in the Senior High School the STEM Strand during the early implementation of the K to 12 Program in De La Salle Lipa, Philippines. Likewise, the researchers are optimistic that through this study, indicators for each principle of maintaining a constructivist classroom will be identified. Moreover, an action plan is proposed on how teachers can maintain a constructivist classroom.

1.1. PROBLEM STATEMENT:

This study explored the experiences and challenges being faced by Senior High School Teachers in the STEM Strand as they maintain a constructivist classroom based on the principles stated in the article Concept to Classroom (2016) such as the following: (1) posing problems that are or will be relevant to the students; (2) structuring learning around essential concepts; (3) being aware that students' points of view are windows into their reasoning; (4) adapting curriculum to address students' suppositions and development; and, (5) assessing student learning in the context of teaching. Likewise, these experiences can be considered, as indicators for each principle of maintaining a constructivist classroom will be identified. Moreover, an action plan is proposed on how teachers can maintain a constructivist classroom.

1.2. LITERATURE REVIEW:

Constructivism is a vague concept but is currently discussed in many schools as the best method for teaching and learning (Powell and Kalina, 2016). In the constructivist classroom, the focus tends to shift from the teacher to the students in such a way that learners are the builders and creators of meaning and knowledge (Learning Theory, 2016). Applefield, et al (2016) emphasized that constructivism proposes that learner conceptions of knowledge are derived from a meaning-making search in which learners engage in a process of constructing individual interpretations of their experiences. Lunenberg (2011) explained that students are ultimately responsible for their own learning within a learning atmosphere in which teachers value student thinking, initiate lessons that foster cooperative learning, provide opportunities for students to be exposed to interdisciplinary curriculum, structure learning around primary concepts, and facilitate authentic assessment of student understanding. Learning must start with the issues around which students are actively trying to construct (Ramnath and Sivakumar, 2011). Constructivists believe that learning progresses primarily from prior knowledge, and only secondarily from the materials we present to students (Alber, 2011). Alber (2011) added that launching the learning in your classroom from the prior knowledge of your students is a tenet of good teaching.

The classroom is no longer a place where the teacher pours knowledge into passive students who wait like empty vessels to be filled (Open Educational Resources of UCD Teaching and Learning). Constructivist teaching is based on the belief that learning occurs as learners are actively involved in a process of meaning and knowledge construction rather than passively receiving information (Gray, 2016). Lewis and Williams (1994) as cited by Schwartz (2016) stated that learners should be provided with experiential learning in which they will apply knowledge to experience to develop skills or new ways of thinking. As explained by Lewis and Williams (1994) as cited by Schwartz (2016) that experiential learning immerses learners in an experience that encourages reflection to develop new skills, new attitudes and new ways of thinking. It is also worthy to consider that knowledge is constructed when an individual attaches meaning to an experience or activity (Merriam et al., 2007; Torre, Daley, Sebastian, Elnicki, 2006 as cited by Nyback, 2013). Anderson (2016) suggested that teachers should provide manipulatives and primary resources to enhance and guide them in learning. Gray (2016) also emphasized that constructivist teaching fosters critical thinking and creates motivated and independent learners. Constructivist teaching strategies have a great effect in the classroom both cognitively and socially for the student. A teacher must understand and use methods of both cognitive and social constructivism if he or she is to run effective constructivist classroom (Powell and Kalina, 2016). According to Gray (2016), in the constructivist classroom, both teacher and students think of knowledge as a dynamic, ever changing view of the world we live in and the ability to successfully stretch and explore that view – not as inert factoids to be memorized. The same author stated that the following are the key assumptions

of this perspective include: (1) what the students currently believes, whether correct or incorrect is important; (2) despite having the same teaching experience, each individual will base their learning on the understanding and meaning personal to them; (3) understanding or constructing a meaning is an active and continuous process; (4) when students construct a new meaning, they may not believe it but may give it provisional acceptance or even rejection; (5) learning may involve some conceptual changes; and, (6) learning is an active, not a passive process and depends on the students taking responsibility to learn

With the aforementioned scenario on the use of constructivist approach in learning, it can be said that the main activity in a constructivist classroom is solving problems (Gray, 2016). The same authors stated that constructivist teaching is based on the belief that learning occurs as learners are actively involved in a process of meaning and knowledge construction rather than passively receiving information. Gray (2016) also stated that students are interactive in a constructivist classroom Powell and Kalina (2016) added that students use inquiry methods to ask questions, investigate a topic and use a variety of resources to find solutions and answers. As students explore the topic, they draw conclusions and as exploration continues, they revisit those conclusions. The article Learning Theory (2016) added that a productive, constructivist classroom provides students with experiences that allow them to hypothesize, predict, manipulate objects, pose questions, research, investigate, imagine and invent. The above statements confirmed the findings of Bhattacharjee (2015) that learning is embedded in a rich authentic environment

In addition, D' Angelo, et al (2016) emphasized, constructivist framework involves problem – solving situations where learning is self – directed, which left unchecked lead to potential misconceptions. Likewise, what students already know about the content is one of the strongest indicators of how well they will learn new information relative to the content (Marzano, 2004). According to Vermette and Foote (2001), teachers should understand constructivist strategies and cooperative learning and their relationship to each other and teachers should be better able to design lessons maximizing the potential of these two approaches. In an article I entitled “Concept in the Classroom” it is emphasized that a Constructivist teachers pose questions and problems, they guide students to help them find their own answers Likewise, teachers may prompt student to formulate their own questions (inquiry), allow multiple interpretations and expressions of learning (multiple intelligences) and encourage group work and use of peers as resources (collaborative learning). Therefore, a constructivist teacher and classroom: the learners are interactive and student centered; and the teacher facilitates a process of learning in which students are encouraged to be responsible and autonomous (Powell and Kalina, 2016). Powell and Kalina (2016) further explained that teachers have to know where the student is at a given learning point or the current stage in their knowledge of subject so that students can create personal meaning when new information is given to them. While in the classroom, teacher have the potential to teach constructively, if they understand if they understand constructivism. Thus, classrooms become multidimensional, with different activities at different levels taking place simultaneously (Bhattacharjee, 2015).

It is also important to remember that) explained that it is right for teachers to give students activities because teachers' role in a constructivist classroom is to challenge the learners' thinking not to dictator or attempt to proceduralize that thinking. In addition, there are researchers on guided discovery learning and pure discovery learning demonstrates that students engaging in guided discovery learning activities outperform students in pure discovery (Savery and Duffy, 2001 as cited by D' Angelo et al, 2016). Contextual approach, experiential learning, and inquiry based learning, problem solving approach, field trips, techno-pedagogy, concept mapping, investigatory approach are the student centered approaches, these approaches are helpful in meaningful learning. If teachers use these approaches according to the necessity of content transaction in classroom, then learning is constructed, active, reflective, collaborative and evolving among learners (Mir and Jain, 2015). Inside the classroom, constructivism favors evaluation for and as learning (formative and self-assessment), as opposed to evaluation of learning (summative assessment) (Leong, 2012). As what Burry – Stock (1995) and Zahorik, (1995) as cited by Hamal (2009) stated, a range of techniques is used in assessments. These forms of assessment should be authentic. In authentic learning, learners assume increasingly more control over the sequence in which they want to engage their learning and are free to explore the various local details of the topic. They can build their own mental frameworks in ways that are natural to them, unencumbered by a superimposed logical sequence (Schell, 2016). Likewise, the additional outcome for authentic learning in a constructivist curriculum thus becomes: “learning that triggers critical self-reflection, through which students' worldviews and values are confirmed or challenged” (McKenzie, 2002).

As what Zimmerman explained (2015), in education, the real trajectory of learning can be seen in the transition from teacher-led instruction to lifelong, self-directed learning. It's the trajectory of ownership – from performing upon command to performing for the love of the performance. And that's precisely why so many people give up so much of their lives for this enterprise we call education. The love of learning is so deep in them that it becomes the principle message they need to communicate to those students under their tutelage: live to learn and learn to live. These imply that teachers in the Senior High School followed the constructivist framework as stated in the Basic Education Act of 2013.

1.3. THEORETICAL BACKGROUND:

Constructivism is a view of learning based on the belief that knowledge isn't a thing that can be simply given by the teacher at the front of the room to students in their desks. Rather, learners through an active mental process of development construct knowledge; learners are the builders and creators of meaning and knowledge (Open Educational Resources of UCD Teaching and Learning, University College Dublin, 2016). Alessandri and Larson (2010) emphasized that Constructivism has become popular term that refer to many things, including the way teachers teach and the way students learn. Likewise, the Republic Act 10533 also known as Enhanced Basic Education Act of 2013 of the Philippines emphasized that the curriculum shall use pedagogical approach that is constructivist, inquiry – based, reflective, collaborative and integrative. According to the article Concept to Classroom (2016), the following are the guiding principles in maintaining a constructivist classroom: Principle 1. Pose problems that are or will be relevant to the students; Principle 2. Structure learning around essential concepts; Principle 3. Be aware that students' points of view are windows into their reasoning; Principle 4. Adapt curriculum to address students' suppositions and development; and, Principle 5. Assess student learning in the context of teaching. As can be gleaned in Figure 1, the constructivist framework follows a curriculum that is constructivist, inquiry – based, reflective, collaborative and integrative. This curriculum can only be achieved if the five principles are met inside the classroom. This means that each of the principle contributes to the constructivist framework in such a way that if one is not followed or maintained, the goal of the SHS curriculum will not be attained.

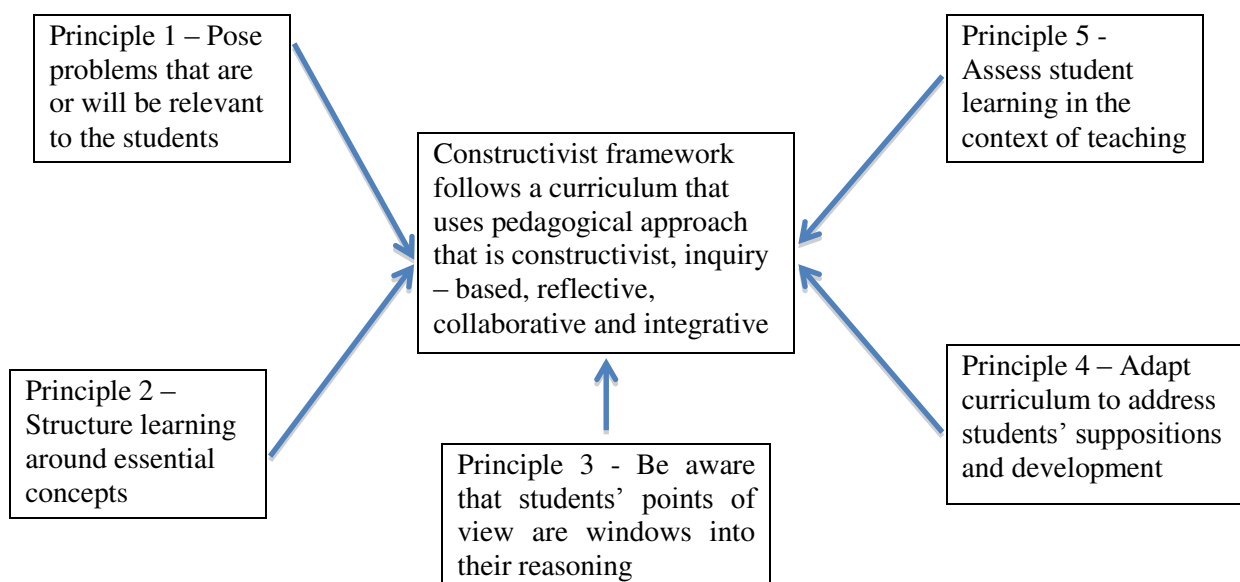


Figure 1. Conceptual Framework

2. METHOD:

Qualitative method of research is used in this study to explore the experiences and challenges being faced by Senior High School Teachers in the STEM strand as they maintain a constructivist classroom. This study was conducted in the College of Education, Arts and Sciences and the Senior High School Department of De La Salle Lipa, Philippines among twenty – two teachers since most of the faculty members of the Senior High School STEM Strand are also faculty members of the said college during the early implementation of the K to 12 program and during its transition period. The main instrument used in conducting this qualitative research is a list of guide questions for focus group discussion based on the five principles of maintaining a constructivist classroom (Concept to Classroom, 2016)). Specifically these questions addressed the experiences and challenges encountered by the teachers in the Senior High School teachers STEM Strand. A moderator's guide was written containing the following to help the moderator solicit information needed by the researchers and to maximize the time allotted for the discussion: (1) list of the five principles in maintaining a constructivist classroom based on the article Concept to Classroom (2016); (2) questions that will address the experiences of the teachers in each of the five principles; and, (3) questions that will address the challenges encountered by the teachers in each of the five principles. The focus group discussion started with the moderator welcoming the participants and briefing them on the process. He also emphasized that there are no right or wrong answers and it was requested that each participant would speak one at a time and maintain confidentiality. The teachers that the session will be recorded. In – depth discussion followed on experiences and challenges of the teachers in maintaining a constructivist framework. The moderator managed the session and ensured that all questions had been answered. During the discussion, the moderator encouraged everyone to share their experiences and there was times that some of the teachers disagreed with another participant's point of view. In

order for all participants to express their views, the moderator sought everyone's opinion so no one will dominate the discussion. It was also noticeable that from time to time, the moderator checked if the person in charge of audio – recording and note – taking if everything had been recorded and jotted down. The session ended with a closing statement of gratitude from the moderator.

In analyzing qualitative data, the researchers used framework analysis. One of the researchers did the verbatim or word for word transcription of the interview after audio recording of the focus group discussion To become familiar with the data collected from the focus group interview, listening to the audio recording several times during and after the verbatim or word for word transcription was done. The transcription was encoded in the computer Microsoft Word format and had been printed in several copies for continues review. The researchers read their own copy of the printed transcripts several times and put label or code on the line or passage that best describe the experiences and challenges encountered by the teachers in the Senior High School STEM Strand in each of the five principles of maintaining a constructivist classroom. After putting labels or codes in each of the passages or lines, the researchers compared their interpretations and reconciled them to come up with the same labeling or coding of data. Then, each of the lines or passages were analyzed according to the principles of maintaining a constructivist classroom and classified them whether experiences of challenges. These principles served as the theme. A working diagram as analytical framework was constructed for each of the five principles of maintaining a constructivist classroom with Senior High School teachers' experiences on the left side and challenges on the right side. Below each of the five diagrams, which correspond to the five principles of maintaining a constructivist classroom, are direct quotations or statements of the respondents together with reference numbers such as Teacher 1 to Teacher 22 to explain the findings of the study.

2.1. WRITING OF THE ACTION PLAN:

Based on the findings of this study, an action plan is forwarded based on the experiences and accompanying challenges identified in each of the five principles of maintaining a constructivist classroom. Inclusion of the experiences and challenges in the action plan depends on the number of times it or they appeared in the analysis of data through the diagram. Each component of the action plan will be implemented as soon as possible and they are already part of the professional development activities of the De La Salle Lipa Senior High School.

3. DISCUSSION:

Senior High School curriculum emphasizes that it will use pedagogical approach that is constructivist, inquiry – based, reflective, collaborative and integrative. This leads to a lot of queries on the part of the teachers of De La Salle Lipa who are involved in its early implementation considering that most of the faculty members are teaching in the college. As what the article Learning Theory (2016) explained that becoming a constructivist teacher may prove a difficult transformation since most teachers have been prepared for teaching in the traditional manner. The same author explained that this requires paradigm shift as well as willing abandonment of new ones. The question now is on how to maintain a constructivist classroom based on the experiences of teachers in the Senior High School STEM Strand as well as the challenges they faced in the first years of its implementation. There are limited literature to answer this query because most of the authors focus on constructivist theory, constructivist learning and teaching and constructivist approach. Only the article Concept to Classroom (2016) gives the concrete ways of maintaining a constructivist classroom. Thus, this study can shed light on this aspect of constructivist learning and teaching.

According to the article Concept to Classroom (2016), there are five guiding principles in maintaining a constructivist classroom. Principle 1 states that teachers pose problems that are or will be relevant to the students. Based on teachers' experiences of giving activities and advance assignments to the students; using common objects to explain concepts and using students' experiences, teachers are challenged to understand students' prior knowledge aside from rephrasing questions when asking students; considering students' readiness on the pedagogy to be used; giving activities that have direct impact to the students and considering discrepancy in the continuity of the topic, limited students' knowledge and highly technical topics. These experiences of the Senior High School teachers confirm the statement from the article Learning Theory (2016) that prior knowledge impacts the learning process and the same article reminded teachers that it is also important to reflect on past and immediate experiences as learners construct their own understanding. Looking into experiences, It can be surmised that constructivist framework gives importance to students' prior knowledge as an important component for students to construct new knowledge. Gray (2016) explained that constructivist teaching is based on the belief that learning occurs as learners are actively involved in a process of meaning and knowledge construction rather than passively receiving information. It is also worthy to note that many authors on the concept of constructivism agree with the above findings. However, the Senior High School students in this study came from various schools that used different approach to learn the spiral curriculum that can affect the conduct of this study. But Anderson (2016) explained that the situation cited is common scenario all over the world as 21st century classroom is filled with dynamic assortment of learners, which create a challenge for teachers as they attempt to accommodate the needs of all learners within the various academic settings. D' Angelo, et al (2009) gave assurance that many nations remain suspicious when teaching methods differ

from the forms of instruction they experience in school as long as experiences and challenges encountered by teachers in the Senior High School STEM Strand focus on personal relevance as confirmed by Lebow (1993) as cited by D'Angelo (2016).

Principle 2 states that teachers structure learning based on essential concepts (Concept to Classroom, 2016). Based on the experiences of the teachers in the Senior High School STEM Strand, there are many topics to be discussed in different subjects; they use KWL chart; focus on activities that enable students to learn concepts; and, they provide experiential learning. However, the following are the challenges they encountered: recognizing prior knowledge; making discussion simple and shallow; assigning few teachers to plan the lessons; making sure that the activities are tailor – fit to the required competencies; considering the level of activities to be given to the students; as well as the “subject itself”, limited time and schedule as well as the laboratory room are challenges in itself. These findings support the claims of many authors on the importance of prior knowledge in a constructivist approach in such a way that self – assessment of prior knowledge is an efficient strategy to provide students opportunity to assess their own knowledge and skills (Gee, 2012). Murphy (1997) agreed that this experience is an indicator that teachers maintain a constructivist classroom through activities, opportunities, tools and environments that encourage metacognition, self-analysis -regulation, -reflection and awareness. Indeed, in maintaining a constructivist classroom, D' Angelo, et al (2016) reminded teachers that they should limit the amount of information that can exist in working memory at one time (D' Angelo, et al, 2016).

Principle 3 states that teachers should consider that students' points of view are windows into their reasoning (Concept to Classroom, 2016). Based on the Senior High School STEM Strand teachers' experiences, they shared that they gave importance to the following: considering personal experiences as foundations of reasoning; making connections; accepting new learnings; and recognizing lack of articulation that will lead to misinterpretation. However, the following are the challenges they faced: students tend to give what had been taught by the teachers; students are not receptive; teachers should consolidate students' ideas; teachers should give students freedom and flexibility in choosing the type of learning activity that they will perform; and, teachers should look into the learning styles of the students. The experiences of the teachers conform to constructivist framework that that learners are the builders and creators of meaning and knowledge (Learning Theory, 2016) by providing students activities and experience in which knowledge is constructed (Merriam et al., 2007; Torre, Daley, Sebastian, Elnicki, 2006 as cited by Nyback, 2013) and connections have been established between facts and new understanding (On Purpose Associates, 2011). In terms of challenges being encountered in maintaining constructivist framework, teachers should be reminded that they should consider multiple perspectives and representations of concepts and contents given by students. The article Learning Theory (2016) also emphasized - students should be actively involved in their learning to reach new understandings. It is also important to consider that one of the core goals of constructivism that is promoting democratic learning environment (Langer and Applebee, 1987 as cited by D' Angelo, et al, 2009). This also confirms the statement of Gray (2016) that constructivist framework promotes flexibility to met varied needs of students. With this scenario, classrooms become multidimensional, with different activities at different levels taking place simultaneously (Bhattacharjee, 2015).

Principle 4 states that teachers should adapt a curriculum that will address students' suppositions and development. Based on teachers' experiences, they are able to: consider perceptions or notions about the topic; give activities to students; post questions or guidelines; and, give rubrics before the presentation. However, the challenges they face are: digging into students' prior knowledge; recognizing that constructivist framework is time consuming; and, preparing many rubrics. These findings on teachers' experiences confirm the suggestion of Bhattacharjee (2015) that learning is embedded in a rich authentic environment in which teachers' role is to challenge learners' thinking not to dictate or attempt to proceduralize that thinking (Savery and Duffy, 2001 as cited by D' Angelo et al, 2016). Upon looking at the challenges teachers encountered, students' prior knowledge impacts the learning process in the constructivist framework (Learning Theory, 2016). It is also important to consider that in accomplishing an authentic task to demonstrate content and performance masteries, rubrics should be prepared by teachers to evaluate students' work and provide criteria on what are expected from the students (Smith, 2016).

Principle 5 states that teacher should assess student learning in the context of teaching. Based on the experiences of the teachers, they consider important topics; ask few questions; use various kinds of assessment; use formative evaluation; require students to submit performance task; consider student reflection; and, inclusion of self, peer and teacher evaluation. However, the following are the challenges they encounter: kind of assessment to be used; assessment should be well – thought and well – planned assessment; consider students with Math anxiety; when to record formative assessment; rubrics are still subjective; and, date and time of submission of requirements. These findings confirm that assessment following the constructivist framework is interwoven with teaching (Bhattacharjee, 2015) because it focuses on learners' thinking processes (Leong, 2012). Based on Senior High School STEM Strand teachers' experiences, that a range of techniques is used in assessment (Burry – Stock, 1995 and Zahorik, 1995 as cited by Hamal, 2009). Like what Senior High School students are required to submit as examples of their performance tasks or authentic tasks, Weidinger (2015) enumerated the following as evidence of understanding:

journals, research reports, physical models and artistic representations. Students' reflections are also used as a form of assessment as this framework focus on opportunity to reflect on one's learning (Lebow, 1993 as cited by Murphy, 2007). It should be remembered that presenting authentic tasks (Jonassen, 1994 as cited by Murphy, 1997). Authentic tasks should be assessed through collaborative evaluation that includes self, peer and teacher evaluations. Teachers also make use of formative assessment that should not be graded because it is about measuring where students are in their learning and giving them feedback (Heitin, 2015). Hamal (2009) added that formative assessment is used to improve the quality of student learning not to improve evidence for evaluating or grading students. Many teachers can relate to this kind of challenge especially in Mathematics subjects where students experienced Math anxiety. According to Kim (2005), constructivist teaching had some effect on anxiety towards learning. To summarize, teachers in the Senior High School STEM Strand maintained a constructivist classroom during the program's early implementation as evident in their experiences and challenges encountered. Teachers practiced all of the five principles of maintaining a constructivist classroom as stated in the article the Learning Theory (2016). However, they should be able to address the challenges they encountered.

4. CONCLUSION:

Based on the experiences of College teachers who are assigned to teach in the SHS during the program's early implementation, they followed the five principles of maintaining a constructivist classroom in such a way that these experiences can be considered as indicators for each principle. Teachers should pose problems that are relevant to the students by trying to see where the students are; giving activities and advance assignments; using common objects to explain concepts; considering students' experiences; and, giving "snaphots" of real life situations. However, teachers are challenged to look into roadblocks in identifying students' prior knowledge; give activities that have direct impact to the students; consider learners' readiness on the pedagogy to be used; rephrase questions when asking students; identify discrepancy in the continuity of the topic; recognize students' limited knowledge and highly technical topics. In structuring learning around essential concepts, teachers noticed that there are many topics included in different subjects; use KWL chart; and, focus on activities that enable students to learn concepts and provide students with experiential learning. However, teachers should recognize students' prior knowledge; make discussion simple and shallow; make sure that the activities are tailor – fit to the required competencies; consider level of activities to be given to the students because "subject itself" is technical and limited time is allotted; and, consider the schedule and venue as well as few teachers are assigned to plan the lessons. In considering students' points of view as windows to their reasoning, teachers experienced that personal experiences are foundations of reasoning as well as making connections and accepting new learnings; and, recognizing misinterpretation because of lack of articulation among the students. However, teachers are challenged to understand students on why they tend to give what the teachers had taught and why students are not receptive; and on the part of the teachers, they should consolidate students' ideas, should give students freedom and flexibility in choosing the type of learning activity that they will perform, and should look into the students' learning styles. In adapting a curriculum to address students' suppositions and development, teachers experienced considering students' perceptions or notions about the topic; giving activities to students; posting questions or guidelines; and, giving rubrics before the presentation. However, teachers should dig into students' prior knowledge, which is time consuming; and, there are many rubrics to be prepared in rating students' performance tasks. Teachers also experienced that it is important to assess students learning in the context of teaching through considering important topics and asking few questions in using various kinds of assessment; giving formative evaluation; requiring students to submit performance task as well as student reflection; and, considering inclusion of self, peer and teacher evaluation. However, teachers are challenged to come up with a well – thought and well – planned assessment; consider students with Math anxiety; take into consideration that formative assessment should not be recorded; and, consider that rubrics are still subjective as well as date and time of submission of requirements. Thus, an action plan is forwarded to maintain a constructivist classroom.

5. RECOMMENDATIONS:

Based on the findings of this study, it is recommended that College teachers assigned to teach in the Senior High School STEM Strand, should consider the five principles of maintaining a constructivist classroom and its indicators based on the experiences of De La Salle Philippines' teachers during its early implementation. Specifically, SHS teachers should consider students prior knowledge and provide them with experiential learning activities as foundation of learning. It is also recommended that SHS teachers should participate in the activities specified in the action plan on maintaining a constructivist classroom.

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