SEAMEO INNOTECH

Pedagogical Approaches in Education

Theories, Practices, and Applications in the Classrooms

A compilation of online presentations delivered during the webinar on **"The Making of Teacher-Experts in the New Normal: Deepening the Understanding of Pedagogical Approaches"** last 22 June 2022

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Contents

Foreword

Over the past two years, we saw numerous changes in how we teach and how our students learn. Our classrooms have definitely evolved—we have been meeting our students virtually, or making learning happen through modules and other resources. Even our curriculum was modified to focus on the most essential competencies. We had to adapt our teaching practices as well. Different forms of assessment also emerged to align with this new way of teaching and learning. We also gained new partners in facilitating learning at home.

With so many changes taking place, we anticipate a new kind of transition. Teachers and students have to adjust once again to a different set-up. While the expansion of face-to-face classes may appear like getting back to normal (as in the pre-pandemic time), the reality is that things will not be the same as before. The experience during the pandemic has opened new doors and windows, along with different pathways to delivering instruction and managing our classes.

It is important for us, teachers, then to understand how we should re-position ourselves and adapt—if not lead the transition—into emerging policies and practices. The pedagogical approaches applied are crucial in the teaching-learning process which the Philippine Government recognized by having the approaches inscribed in Republic Act 10533. We should know how to ably use these approaches in our new and evolving classrooms.

This webinar is timely as we undergo a critical period of change to move towards the transitions in the education sector, and the country in general. This webinar will reinforce your knowledge and skills in using the five mandated pedagogical approaches. But more importantly, we hope that this activity will give you a wider perspective on how you can effectively apply the pedagogical approaches amidst the changes, amidst the new normal and bring about the change in student outcomes we educators wish for and work hard for.

The webinar is but part of a larger study that would seek to determine the policy and practices relating to implementation of the different pedagogical approaches, and yield new insights on improving current policy.

More importantly, this webinar, and the response from the teacher participants, opened an opportunity to delve deeper into these pedagogical approaches and fully utilize the knowledge and information shared here. This is an emerging knowledge management strategy for SEAMEO INNOTECH, whereby we optimally manage knowledge resources—in this case, drawing from the extensive knowledge and experience of our resource persons, and distill the information to support our teachers' self learning. In packaging the presentations as new learning materials, we also look forward to your feedback which could give a better picture on how INNOTECH can best meet your knowledge and information needs. With better information, we hope to lead to improved teacher performance and eventually move forward to better learner achievement and effective engagement.

We thank the resource persons from the academe who will share their expertise with us and hopefully pave the way for an enriching continuing dialogue that would benefit the research team and participants.

DR. RAMON C. BACANI
Director, SEAMEO INNOTECH

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Republic Act No. 10533
Enhanced Basic Education Act

Section 5(e)
The curriculum shall use pedagogical approaches that are constructivist, inquiry-based, reflective, collaborative, and integrative.

"

Introduction

The Republic Act No. 10533, more commonly known as the Enhanced Basic Education Act of 2013, mandated in Section 5 that the curriculum shall use pedagogical approaches such as constructivism, inquiry-based, reflective, collaborative, and integrative.

The law is supported by DepEd Order No. 21, s. 2019 on Policy Guidelines on the K to 12 Basic Education Program to ensure that schools will implement these learner-oriented approaches to support the new K to 12 curriculum. Teachers were instructed to adopt strategies and learning opportunities that foster active learning, cooperative learning, collaboration, exploration, contextualized, and relevant.

With the sudden shift away from the classroom because of the global pandemic, education has changed dramatically. The Department of Education (DepEd) adopted several measures and developed new policies to ensure that learning continued in all areas in the Philippines—thus, defining the new normal in basic education.

To further understand pedagogical approaches and its extent of implementation in the new normal, DepEd and SEAMEO INNOTECH launched a joint research project entitled "Examining the Extent of Implementation of Pedagogical Approaches (R-2I-2C) in the New Normal in Public Schools." The study will look into how pedagogical approaches are applied in the classrooms and what are the challenges in the implementation of these approaches in the new normal.

In this compilation, the content experts from the preliminary webinar on "The Making of Teacher-Experts in the New Normal: Deepening the Understanding of Pedagogical Approaches" expounded on the five pedagogical approaches:

*   **Reflective**
    Dr. Liza Marie C. Olegario
    University of the Philippines Diliman

*   **Inquiry-Based**
    Dr. Ma. Nympha B. Joaquin
    University of the Philippines Diliman

*   **Integrative**
    Dr. Rita B. Ruscoe
    Philippine Normal University

*   **Collaborative**
    Dr. Felicia I. Yeban
    Philippine Normal University

*   **Constructivist**
    Dr. Jessie S. Barrot
    National University

To watch the webinar presentations, please visit this link:
https://youtu.be/YQStCmy8Ieg

HOW DO STUDENTS LEARN IN THE FIVE PEDAGOGICAL APPROACHES IN EDUCATION (R-2I-2C)?
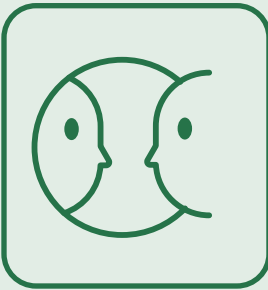
REFLECTIVE

Students make sense of their experiences by understanding the context of learning, their own contribution to that context, and by drawing from literature to explain these experiences.

INQUIRY-BASED

Students are active participants in the learning process and is driven by their questions and innate curiosity.
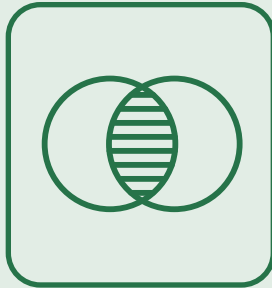
INTEGRATIVE

Students learn in a way that curriculum content cuts across different learning areas and contexts.
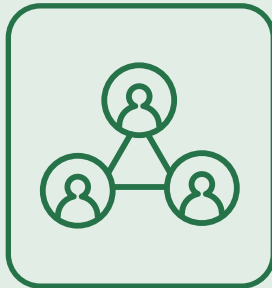
COLLABORATIVE

Students learn through working together with others to create knowledge and achieve shared learning goals.

CONSTRUCTIVIST

Students construct their own knowledge, and their reality is determined by their own experiences.
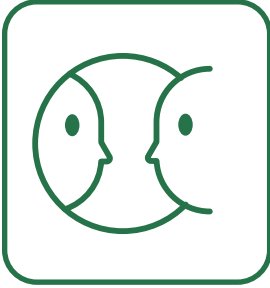
Reflective Pedagogical Approach

DR. LIZAMARIE C. OLEGARIO

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According to Généreux & Thompson (2008), reflection is seldom part of today's education, perhaps explaining why students think that learning is about memorizing facts. The Philippines K-to-12 curriculum promotes the shift from the behaviorist, commonly referred to as conventional or traditional type of education, to the constructivist type of education. Despite this shift, it is observed that teachers still design performance tasks that tap lower order thinking skills (Olegario, 2018). This may be due to the fact that the Philippine Education system has been implementing the

behaviorist approach and points to the need for teacher professional development in pedagogy.

As education continues its shift away from passive learning towards greater student autonomy and active strategies (e.g. Chan, Wong, Law, Zhang, & Au, 2017; Lo, 2010 in Chan & Lee, 2021), it has created more student-centered and experiential learning opportunities while also enabling students to become more responsible and self-directed learners. (Chan & Lee, 2021). The overarching principle of the five major pedagogical approaches, namely, constructivist, collaborative, integrative, reflective, and inquiry based learning, is constructivism, which is in nature, active and student-centered. This paper focuses on the reflective pedagogical approach.

Theoretical Foundations

The main theoretical framework that first included the reflective pedagogical approach is the Kolb's Experiential Learning Cycle, which stresses that the full learning process involves the contrasting concrete learning and the abstract conceptualization dimensions, and the contrasting reflective observation and active experimentation dimensions. In the experiential learning cycle, learning may start from any of the dimensions. Thus, the framework is also considered as learning styles because individuals learn best when they start from the dimension that they learn best. However, learning is complete when the individuals go through all the cycles.

KOLB'S EXPERIENTIAL LEARNING CYCLE
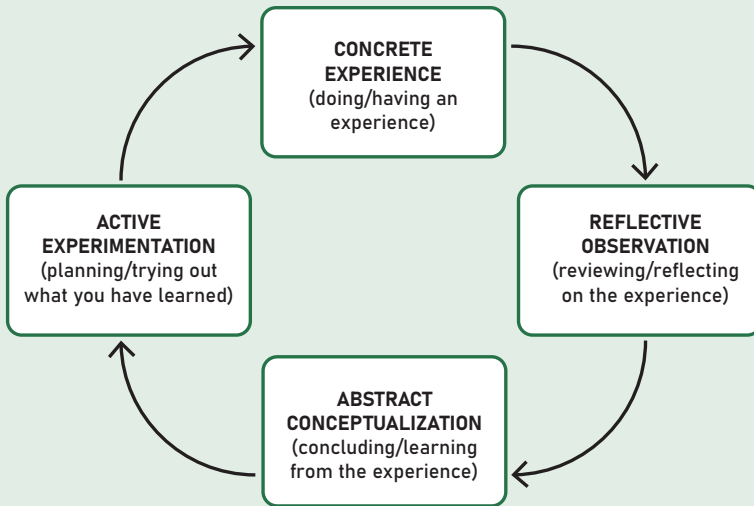
Note: From "What Are Kolb's Learning Styles And What Do They Mean?," by Sean McPheat, 2017, https://www.skillshub.com/what-are-kolbs-learning-styles/

Corney (in Batista, 2007) noted the parallels among Kolb's work, Greenaway's Active Reviewing Cycle and Argyris and Schon's Theories of Action and overlaid them on a 4-stage cycle as you can see in the figure in the next page. The figure shows that for the learning cycle to be complete, four elements should be present: 1) The learners have to have concrete experiences; 2) The learners have to reflect on their experiences; 3) The learners have to conceptualize the experience in their own terms; and 4) The learners have to apply their conceptualization.

EXPERIENTIAL LEARNING CYCLE

ACT

Concrete Experience

Facts (What happened?

Theory of Action

APPLY

Active Experimentation

Futures (What will I do?)

Implement Revised Theory

REFLECT

Reflective Observation

Feelings
(What did I experience?

Assess Behavior &
Consequences

CONCEPTUALIZE

Abstract Conceptualization

Findings
(Why did this happen?

Revise Theory

David Kolb

Roger Greenaway

Chris Argyris & Donald Schön
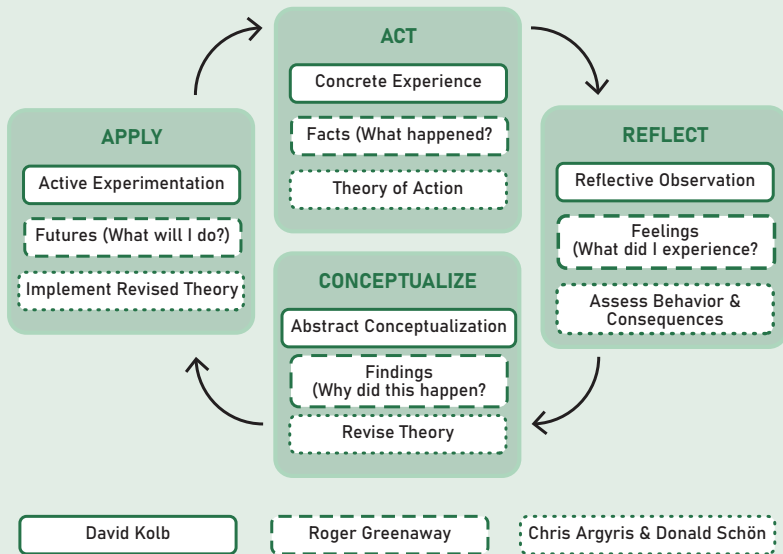
Note: From "Experiential Learning Cycle," by Ed Batista, 2007,
www.edbatista.com/2007/10/experiential.html

Corney (in Batista, 2011) simplified the experiential learning cycle and came up with the figure in the next page. Learning usually starts from action or doing it, then reflection on what happened and what resulted from ones actions, then conceptualizations on the implications of the results and the conclusions that can be drawn from the experience, answering the question "so what?". Afterwards, there's the application where the learners answer the questions "now what?" and "What will I do more of, less off, start or stop the next time?"

SIMPLIFIED EXPERIENTIAL LEARNING CYCLE
CORNEY'S (IN BATISTA, 2011) SIMPLIFIED EXPERIENTIAL LEARNING CYCLE

ACT

APPLY
What will I do more of, less of, start or stop the next time?

REFLECT
What happened? What resulted from my actions?

CONCEPTUALIZE
What do these results imply? What conclusions can I draw?
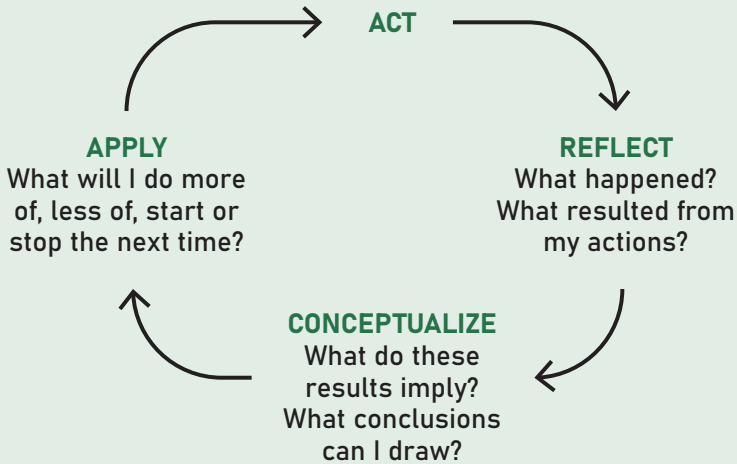
Note: From "Experiential Learning Revisited," by Ed Batista, 2011, https://www.edbatista.com/2011/09/experiential-learning.html

For the students to become effective learners, they need to develop four kinds of abilities which correspond to the four stages of Kolb's learning cycle: 1) Concrete Experience (CE) abilities; 2) Reflective Observation (RO) abilities; 3) Abstract Conceptualization (AO) abilities; and 4) Active Experimentation (AE) abilities. Concrete experience (CE) is the "ability to employ intuitive understanding in the present reality and sensitivity towards other people's emotions and values (p. 3-4, Bwegyeme & Munene, 2021)."

It is the ability to easily engage in new experiences and not to get stuck in the old experiences. Reflective Observation (RO) is the ability to "take time-out from doing and stepping back from the task and reviewing what has been done and experienced (p. 4, Bwegyeme & Munene, 2021)." According to Dewy, Kolb, Mezirow (in Bwegyeme & Munene, 2021), reflection is the key to transforming experience into learning. Abstract conceptualization (AC) is the ability to make sense of what has happened and interpret the events, understand the relationships between them, and integrate observations and reflections into new theories (Bwegyeme & Munene, 2021)." Active experimentation (AE) is the ability to put into practice what has been learned.

Definition

According to John Dewey (1933), individuals do not learn from experience. Individuals learn from reflecting on experiences. Loughran's (2002) proposition is similar. He stated that experiences alone do not necessarily lead to learning – it is the active and conscious reflection of one's experiences, emotions, actions, and responses that are essential.

Reflection is defined as the process of thinking, evaluating, making sense of existing experiences, as well as planning for future experiences, and are an integral component of both self-knowledge and self-regulation that allows the individual to evaluate, monitor, and improve themselves (Grant, Franklin, & Langford, 2002; Hixon & Swann, 1993; Høyrup, 2004; Mezirow, 1991; Ryan, 2013 in Chan & Lee,

2021). Dewey (1933) describes reflective thought as an "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the conclusion to which it leads". For him, reflection frees individuals from impulsive and routine activity.

Role of the Teacher/ Learner

In contrast to a personal reflection, which may not necessarily move to the critical level, and may not have a conscious or stated purpose, the academic or professional reflection involves learners making sense of their experiences in a range of ways. One is by understanding the context of learning and the particular issues that may arise. Another is by understanding their own contribution to that context, including past experiences, values/ philosophies and knowledge. A third way is by drawing on other evidence or explanation from the literature or relevant theories to explain why these experiences have played out or what could be different. And still another is by using all of this knowledge to re-imagine and ultimately improve future experience (Denton, 2011).

For reflection to result in learning, Schön (1983) presented key features. Reflection is an active and dynamic process, which can involve reflecting 'on' action or reflecting on past experience, reflecting 'in' action or reflecting on an incident as it happens, while it is being done, or reflecting 'for' action or reflection on actions that will be taken in the future. Since it involves the past, present, and future, reflection is a cyclic process, which leads to development of new ideas or insights which can be used for next learning experiences. In reflection, there's a need to look at issues from different perspectives and weigh one's own values and assumptions.

Rolfe, et al. (2001) developed a framework for reflective practice in nursing, which can and has been used by other fields as well. This is based on Borton's (1970) and Driscoll's (1994) model with three interlinked processes stated in colloquial expressions, "What?", "So What?", and "Now What?". Rolfe added cue questions to elaborate the model and these questions can be used by teachers and students in their reflective practice (see next table).

CUE QUESTIONS
(ADAPTED FROM ROLFE, ET AL. 2001 IN BRISTOL CBT [N.D.])

Descriptive Level of Reflection	Theory and Knowledge Building	Action Oriented (Reflexive) Reflection
What?	So what?	Now what?

• What was my experience?
• What was the problem or difficulty?
• What was my role in the situation?
• What was I trying to achieve?
• What actions did I take?
• What was response of others?
• What were the consequences?
  • For the client?
  • For myself?
  • For others?
• What feelings did it evoke?
  • In the client?
  • In myself?
  • In others?
• What was good or bad about the experience?
	• So what does this tell me/teach me/imply/mean about me/my client/our relationship/the model of therapy I am using/my attitudes/my client's attitudes/etc...?
	• So what was going through my mind as I acted?
	• So what did I base my actions on?
	• So what other knowledge can I bring to this situation?
	  • Social policy
	  • Legislation
	  • Theory
	  • Personal experience
	• So what could/should I have done to make it better?
	• So what is my new understanding of the situation?
	• So what broader issues arise from the situation?
		• Now what do I need to do in order to make things better/stop being stuck/improve my client's therapy/resolve the situation/feel better/get on better/etc....?
		• Now what broader issues need to be considered if this action is to be successful?
		• Now what might be the consequences of this action?
		• Now what planning is required to activate the new direction?

Note: From Bristol CBT (n.d.). On reflection: part 3 – reflection as a skill.
https://www.bristolcbt.co.uk/on-reflection-part-3-reflection-as-a-skill/

Gibbs (1988) listed six steps with corresponding questions for reflection: 1) description: what happened?; 2) feelings: what were you thinking and feeling?; 3) evaluation: what was good and bad about the experience?; 4) analysis: what sense can you make of the situation?; 5) conclusion: what else could you have done?; and, 6) action plan: if the situation arose again, what would you do? The model was popular for years, but because it was not easy to recall in practice, Barksby, et al. (2015 in CBT [n.d.]) improved the stages and used the acronym REFLECT. Teachers and students can use this model in reflection activities.

Bain et al. (2002 in Amhag, 2020) came up with a 5Rs framework showing criteria for each level. This framework can be used by teachers and students as a rubric in assessing the level of reflection of an output. The framework shows that (1) The lowest level is reporting or the description of what happened; (2) The second level is responding or the personal response to, an issue or situation; (3) The third is relating or the connection to theory and experience; (4) The fourth is reasoning or interrogating and explaining why the situation, incident, or issue occurred; (5) and the last and highest level is reconstructing or developing a future action, which ultimately transforms practice.

STAGES OF REFLECTION (BARKSBY ET AL., 2015, P. 22)

R – RECALL THE EVENTS (STAGE 1)

Give a brief overview of the situation upon which you are reflecting. This should consist of the facts – a description of what happened

E – EXAMINE YOUR RESPONSES (STAGE 2)

Discuss your thoughts and actions at the time of the incident upon which you are reflecting

F – ACKNOWLEDGE **FEELINGS** (STAGE 3)

Highlight any feelings you experienced at the time of the situation upon which you are reflecting

L – LEARN FROM THE EXPERIENCE (STAGE 4)

Highlight what you have learned from the situation

E – EXPLORE OPTIONS (STAGE 5)

Discuss options for the future if you were to encounter a similar situation

C – CREATE A PLAN OF ACTION (STAGE 6)

Create a plan for the future – this can be for future theoretical learning or action

T – SET **TIMESCALE** (STAGE 7)

Set a time by which the plan outlined in stage 6 will be complete

THE 5RS FRAMEWORK WITH CRITERIA FOR EACH LEVEL
(BAIN, BALLANTYNE, MILLS & LESTER, 2002, P. 13 IN AMHAG, 2020)

5Rs Framework	Level 1	Level 2	Level 3	Level 4
Reporting Descriptive account of what happened or of the situation, incident, or issue.	Minimal description of the situation, incident, or issue.	Broad description with limited significant details.	Sufficient details, allowing learners to draw their own conclusions.	
Responding Emotional or personal response to the situation, incident, or issue.	Focuses on significant aspects with related feelings.	Reasoned judgment of a situation, incident, or issue.	Adds to levels 1 and 2 by questioning or identifying a problem.	
Relating Relate or make a connection between current personal or theoretical understandings of the situation, incident, or issue.	Own strength, weakness, personal learning, professional matters, or future practice.	Adds to level 1 a superficial or limited discussion of the connection to theory.	Adds to levels 1 and 2 expanded insight, discussions, or understandings of the connection between theory and practice.	
Reasoning Highlight in detail or show why the situation, incident, or issue occurred with exploration, questioning, or explanation.	At least one relevant factor analyzed in detail with regard to its importance, impact, or questions for future practice.	Adds to level 1 alternative explanations and/ or interrelationships/factors.	Adds to levels 1 and 2 insights from different perspectives.	
Reconstruction Drawing conclusions and developing a future action plan based upon a reasoned understanding of the situation, incident, or issue.	The discussion leads to a conclusion or a plan for future action.	Adds to level 1 a consideration of the reason.	Adds to levels 1 and 2 the possible impacts of different circumstances.	Adds to levels 1–3 new understandings applied to a personal approach or theory of teaching.

Benefits and Challenges of Using the Reflective Pedagogical Approach

In their review of literature, Chan and Lee (2021) give a good summary of benefits and challenges of using the reflective pedagogical approach. Reflection is important because students better understand themselves through expressing their thoughts and experiences in a focused and structured manner. They better resolve uncertainties and complex situations, as well as consider multiple solutions to a single problem. They become more self-aware of their actions, strengths and weaknesses, and both students and teachers identify the learning needs. They apply skills they fostered and gained from reflections, such as self-awareness, critical thinking, and problem-solving to other aspects of life in the long term. They become more effective learners as they "monitor their learning via different strategies". They can flourish even further as self-learners by engaging in self-assessment activities and having greater ownership and responsibility over their own learning. Through reflection, students practice the ABCs of self-regulation by managing their feelings or Affect, changing their Behaviors, and Cognition thinking about how to make positive changes for the future.

The challenges on the other hand involve all levels of stakeholders, namely, the students, the teachers, the institution, and the community. To summarize, the challenges boil down to: What kind of attitudes towards reflection do the stakeholders have? What are the priorities? Is reflection considered time consuming and effortful? Is it just additional workload for the teachers and the students? Is reflective thinking valued or is there a

preference for passive learning? What reflective knowledge and skills do the teachers possess? Do the teachers have the understanding of and the ability to engage and make our students do reflective activities? How effectively do teachers give feedback to their students' reflections? How do teachers make students in large class sizes do reflections?

Chan and Lee (2021) state that developing reflective thinkers requires reflection literacy from each level of stakeholder, namely: 1) academic literacy, which is defined as the ability to communicate competently in an academic discourse community such as language proficiency (not necessarily English), writing styles, and conventions; 2) Reflection knowledge and skills, which involves the understanding of what reflection means, its purpose, and forms; 3) Assessment literacy, which involves understanding the purpose and processes of assessment; and 4) Social-emotional insights, which acknowledge the attitudes and issues that arise from ethical aspects in assessment, teacher-student relationship, and emotional dynamics of students. Reflection literacy, then, would refer to students' ability to reflect cognitively, express their thoughts and emotions through different means, and understand reflections as both a learning and an assessment tool. Ignorance to the importance of reflection could hinder their engagement in this process.

Common Teaching Strategies and Classroom Activities

Aside from using the framework in experiential learning and reflective activities earlier mentioned in this paper, teachers, can provide the following to prompt and support reflective thinking:

1. Enough wait-time for students to reflect when responding to inquiries.

2. Emotionally supportive environments in the classroom, encouraging reevaluation of conclusions.

3. When mistakes are made, take a moment to process the mistake as a learning opportunity.

4. Classroom activities that are relevant to real-world situations and provide integrated experiences.

5. Authentic (real) problems that require teachers and students to deeply think about solutions.

6. Modelling of metacognitive and self-explanation strategies on specific problems to help students build an integrated understanding of the process of reflection.

7. Study guides or advance organizers to prompt students to reflect on their learning.

8. Social-learning environments such as those inherent in peer-group works and small group activities to allow students to collaborate and to see other points of view.

9. Reflective journal to write down students' positions, give reasons to support what they think, show awareness of opposing positions and the weaknesses of their own positions.

10. Affect, Behavior, and Cognition questions to prompt reflective thinking before learning a topic, when setting a plan or developing a goal, during instruction, and after instruction

Edutopia (2011) gives a good list of 40 reflection questions that the teachers can utilize. The responses to these questions can be presented in many different ways. They can be posted in the social media, can be written in a one-minute paper, can be drawn, presented in videos, or in any form comfortable and interesting to the students.

Backward-Looking:

1. How much did you know about the subject before we started?

2. What process did you go through to produce this piece?

3. Have you done a similar kind of work in the past (earlier in the year or in a previous grade; in school or out of school)?

4. In what ways have you gotten better at this kind of work?

5. In what ways do you think you need to improve?

6. What problems did you encounter while you were working on this piece? How did you solve them?

7. What resources did you use while working on this piece? Which ones were especially helpful? Which ones would you use again?

8. Does this work tell a story?

Inward-Looking:

9. How do you feel about this piece of work? What parts of it do you particularly like? Dislike? Why? What did/do you enjoy about this piece or work?

10. What was especially satisfying to you about either the process or the finished product?

11. What did/do you find frustrating about it?

12. What were your standards for this piece of work?

13. Did you meet your standards?

14. What were your goals for meeting this piece of work? Did your goals change as you worked on it? Did you meet your goals?

15. What does this piece reveal about you as a learner?

16. What did you learn about yourself as you worked on this piece?

17. Have you changed any ideas you used to have on this subject?

18. Find another piece of work that you did at the beginning of the year to compare and contrast with this. What changes can you see?

19. How did those changes come about?

20. What does that tell you about yourself and how you learn?

Outward-Looking:

21. Did you do your work the way other people did theirs?

22. In what ways did you do it differently?

23. In what ways was your work or process similar?

24. If you were the teacher, what comments would you make about this piece?

25. What grade would you give it? Why?

26. What is the one thing you particularly want people to notice when they look at your work?

27. What do your classmates particularly notice about your piece when they look at it?

28. In what ways did your work meet the standards for this assignment?

29. In what ways did it not meet those standards?

30. If someone else were looking at the piece, what might they learn about who you are?

Forward-Looking:

31. One thing I would like to improve upon is ...

32. What would you change if you had a chance to do this piece over again?

33. What will you change in the next revision of this piece?

34. What's the one thing that you have seen in your classmates' work or process that you would like to try in your next piece?

35. As you look at this piece, what's one thing that you would like to try to improve upon?

36. What's one goal you would like to set for yourself for next time?

37. What would you like to spend more time on in school?

38. What might you want next year's teacher to know about you (what things you're good at)?

39. What things you might want more help with?

40. What work would you show her to help her understand those things?

Application: Lesson Planning and Assessment

The application of reflective pedagogical approach has endless possibilities because reflection can occur before, during, and after the learning experience. What is important is that the basic elements and principles discussed in the theoretical foundations of this paper are present in the instructional design.

Since the overarching principle of the five pedagogical approaches is constructivism, the principles in lesson planning and assessment of constructivist and learner-centered education can be followed. Discovery learning, inquiry learning, problem-based learning, and project based learning are all constructivist, cooperative, integrative, and require reflection.

For instance, Parsons (2017) shows in Table 3 the reflection opportunities in the project-based learning design. The essential project design elements can be used as anchors

to reflect in different ways throughout the project. This is just one of the many examples where reflection can be embedded in many parts of the learning experience provided to the students. Because the approach is primarily constructivist, formative and embedded assessment overtake summative assessment. Learning is by doing and assessment is done during the process of learning. The process, not just the product, becomes the focus of teaching and learning.

REFLECTIONS ON PROJECT DESIGN USING THE ESSENTIAL PROJECT DESIGN ELEMENTS (PARSONS, 2017)

Reflection Opportunity in the Project Path:	Reflection Questions to Ask Yourself
Launching the Project	How do I know that the challenge, problem, or driving question pushes students to learn the key content from the problem? What were my criteria in selecting my entry event?
Building Knowledge, Understanding, and Skills	How am I using the students' questions to guide instruction? How will students know their learning targets for this project?
Developing and Revising Ideas and Products	How has your list of students questions changed the trajectory of the project? How did you structure opportunities for students to reflect and receive feedback throughout the project?
Presenting Products and Answers to Driving Question	What are the connections between the public audience and the presentation results? How did the audience assessment of presentations compare to how you assessed them?

Note. From Parsons, C. (2017). PBL in the Mirror: 4 R's of Planning for Teacher Reflection. https://www.idoschool.com/blog/pbl-in-the-mirror-4-rs-of-planning-for-teacher-reflection

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Teaching Through Inquiry-Based Learning

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Definition and Theoretical Foundations of Inquiry-Based Learning

Inquiry-based learning (IBL) is described as a student-centered approach driven by students' questions and their innate curiosity. It is closely related to what scientists use in the field since it capitalizes on interest and promotes a variety of methods that lead to better understanding of concepts or phenomena.

IBL is rooted in constructivism, which states that humans construct their own knowledge and meaning from their personal experiences. John Dewey, a proponent of constructivism emphasized inquiry and the integration of real world and classroom activities. He outlined several important aspects of inquiry-based learning,

such as defining a problem, formulating a hypothesis, and conducting tests (Pedaste et al., 2015). He believed that students should actively participate in the learning process and be given a certain degree of control over what they are learning. However, even before constructivism was established, IBL's ancestry can already be traced as far back as the time of Socrates. Socrates engaged his students and led them to deeper understanding of concepts through dialogues and posing questions. In the Socratic method, the teacher is not the "sage in the stage" but rather, the teacher and the students are both responsible for pushing the dialogue to clarify assumptions through asking probing questions (Friesen and Scott, 2013). This is also one of the general characteristics of IBL.

In 2015, Pedaste and colleagues presented the IBL framework as shown below.

PHASES OF INQUIRY-BASED LEARNING

① **Orientation**: the teacher stimulates curiosity by briefly introducing the topic or concept

② **Conceptualization**: questions are generated and hypotheses are formed

③ **Investigation**: students discover the answers through reading, exploring the Internet, interviewing, or conducting an experiment, and validating their hypotheses using the data or information they have gathered

④ **Conclusion**: students establish their solutions and answers to the questions or problem

⑤ **Discussion/communication**: students share and inform others about their findings and new learnings

Source: IBTL Framework (Pedaste et al., 2015)

Because students' voice matters and IBL capitalizes on the participants' curiosity, students are highly engaged and motivated to study. They experience ownership of their learning, which lead them to better mastery of concepts and retention of knowledge. Kirst (2018) noted that IBL promotes greater interest among students; teaches problem-solving that prepares them for the real world; enhances teamwork skills as they are asked to do collaborative work on the answers to the questions; and fosters long-term knowledge retention because of what students experience during the process. However, he points out that IBL could have certain disadvantages as well. He mentioned that since IBL requires a considerable amount of time, there is always the risk that important topics could be left out. Moreover, since IBL requires communication of ideas among its participants, students with issues on speaking out might not feel at ease or may experience forms of embarrassment. On the side of the teacher, IBL demands them to be adept at questioning. They must develop the skill and art of questioning that provokes deeper thinking among students while sustaining their curiosity and interest. Furthermore, IBL activities require deeper knowledge on some concepts, which the teachers themselves have to study and explore since some forms of inquiry, by nature do not have concrete solutions yet.

Using IBL in the Classroom

A good example on how to apply IBL in a class would be in science lesson on the Circulatory System where the teacher gives a brief motivational introduction on the lesson and then presents students different photos of parts of the body involved in the system. From there students would generate their questions such as:

1. Where does the blood travel as it leaves the heart?

2. What is the difference between arteries and veins?

3. Why do we have red and white blood cells? What are the other components of our blood?

From there, the students read books and explore the Internet to find the answers to their own questions. After discussing among themselves, with the guidance of the teacher, they make their conclusions and share with the class their questions and answers. They can prepare visuals like posters or infographics on this.

Banchi and Bell (2008) identified the different levels of inquiry as follows:

1. Limited/Confirmation Inquiry – Students confirm a principle through an activity. The results are already known in advance.

2. Structured Inquiry – Students investigate a teacher-presented question through a prescribed procedure.

3. Guided Inquiry – Students investigate a teacher-presented question using student designed/ selected procedures.

4. Open Inquiry – Students investigate questions that are student formulated through student designed/ selected procedures. (p. 26)

Many established teaching strategies and approaches are closely linked to the different levels of inquiry described above. Inquiry- Based Learning therefore comes in different forms.

We oftentimes hear about PBL as Problem-Based Learning. Here, students are normally given a problem to which they will find a solution. For example, a Social Studies teacher may ask his students to propose a solution to the Russia-Ukraine conflict. Students then will conduct their own research to answer the problem. The teacher may also provide a list of procedures as in Structured Inquiry. He/she may give them references for reading and links to videos that could help them answer the problem. Or, the teacher may choose not to provide students with these guides and let them decide for themselves how to answer the question. This is now becomes a form of Guided Inquiry. If from the start, the students had to pose the questions or problems and design solutions themselves, then the Open Inquiry is applied.

In another example, particularly in a Mathematics class, instead of traditionally asking students to compute for the area of a shaded region, the teacher may show a picture of an actual space, say, to be carpeted or planted with Bermuda grass, without specifying its dimensions. The teacher then asks the students to come up with strategies on how to compute the area to be covered by a carpet or grass.   This practical real-life problem could make students appreciate their lessons in Mathematics, which is oftentimes presented as abstract concepts without practical applications.

On the other hand, Project-Based Learning is usually multi-disciplinary and as the name implies, requires students to work on a project. An example could be asking students to organize a book reading event, a debate, a cooking festival or a sportsfest. These projects involve application of skills learned in at least two subjects. In a cooking festival where students explain how they make their original recipes in Tagalog or Mother Tongue, skills in Edukasyong Pangtahanan at Pangkabuhayan (EPP) and Filipino are integrated. On the other hand, in holding sportsfests, Physical Education (PE) and English skills are reinforced. Both projects makes use of Inquiry-Based Learning. As the students work on the assigned task, questions are posed, procedures are outlined, solutions are arrived at, and learning occur.

Another approach that has been gaining the attention of educators is Design Thinking. In this approach, students are expected to innovate and produce a product or a process that they can prototype and test. This is now being used at the senior high school level for the capstone project of the STEM track. This is another student-centered approach that can be considered as a variant of IBL.

In general, since IBL is student-centered, the students themselves become actively involved throughout the process of learning. They become co-problem solvers, co-researchers, co-designers and co-creators with their peers and teachers. The main role of the teacher is to facilitate learning. He/she is not an authoritarian source of all knowledge.

Lesson Planning and Assessment

The most appropriate instructional model that conforms to the tenets of IBL is the 5-E lesson plan that has been extended to 6-e or 7-E. The original 5Es stand for **Engage**, **Explore**, **Explain**, **Elaborate**, and **Evaluate**. However, as years passed, **Elicit** and **Extend** have been added. The table in the next page presents a summary of the 6E Instructional Model constructed by Peters and Stout (2015, as cited in Gholam, 2019).

E INSTRUCTIONAL MODEL

Component	Characteristics
Engagement	The teacher or a curriculum task accesses the learners' prior knowledge and helps them become engaged in a new concept through the use of short activities that promote curiosity and elicit prior knowledge.
Exploration	Exploration experiences provide students with a common base of activities within which current concepts (i.e., misconceptions), processes, and skills are identified and conceptual change is facilitated.
Explanation	The explanation phase focuses students' attention on a particular aspect of their engagement and exploration experiences and provides opportunities to demonstrate their conceptual understanding, process skills, or behaviors.
Elaboration	Teachers challenge and extend students' conceptual understanding and skills. Through new experiences, the students develop deeper and broader understanding, more information, and adequate skills. Students apply their understanding of the concept by conducting additional activities.
Evaluation	The evaluation phase encourages students to assess their understanding and abilities and provides opportunities for teachers to evaluate student progress toward achieving the educational objectives.
E-Learning	This phase is infused throughout the model to enhance the technological skills of the learners while they do things such as gather information, engage in explorations, explain and communicate their findings.

Source: Peters and Stout , 2015, as cited in Gholam, 2019, p. 117

In terms of assessment, it should be noted the in evaluating projects and problem-based outputs, the traditional objective assessments do not conform with the IBL approach. We normally assess learning here via rubrics and open-ended questions.

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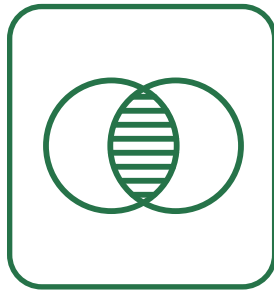
Integrative Pedagogical Approach:
Finding Connections and Meanings

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Integrative Approach is one of the pedagogical approaches for the K-12 Basic Education Curriculum as articulated in RA 10533 also known as the Enhanced Basic Education Act of 2013. Integrative approach is not really new, having been recognized as an approach to teaching-learning since the time when holistic understanding, multidisciplinary education and integrative learning were used in formal, organized education. New developments in the 21st century such as globalization, and rise of information technology, however, bring with it new perspectives, mindsets and behavior in a highly interconnected world characterized by

Disruption, Volatility, Uncertainty, Complexity, Ambiguity and Diversity (D-VUCAD) (Woodward, 2018). For education to be responsive and relevant to these developments and their impact to education, there is a need to explore and develop relevant strategies and approaches for teaching-learning that will allow for meaningful connection across disciplines, application to real life problems and contexts, in-depth learning, multiple perspectives and collaboration, all of which are necessary for learners to cope with the change. As such, integrative approach to teaching, together with the R-21-2C pedagogical approaches, need to be explored and understood in terms of its potential to address the above mentioned characteristics of teaching-learning.

Integrative Approach may be described as an approach to organizing curriculum content in a way that cuts across subject-matter lines, bringing together various aspects of the curriculum into meaningful association (Shoemaker, Betty Jean Eklund, 1989). A curriculum that utilizes Integrative approach may organized curriculum content (knowledge, skills, values and disposition) in a manner that will include "making connections across different Learning Areas (or Subjects), between interests/experiences and new learning, between previous learning, new learning and extended learning, between different contexts (indoors and outdoor/ home and school) and between learners' different experiences" (Integrated approach to Learning, moe.edu.sg). As such, a curriculum with an integrative frame provides an integrative educational experiences that may take place in Individual Course (In Course), Integrated Curricular Programs (Within Curriculum), or Outside the Formal Curriculum (Co-curricular) which will provide learners with a more holistic view of learning.

In integrative approach, the role of the teacher is to plan learning experiences as a whole and design them in a meaningful context so that learners develop and transfer knowledge and skills across different learning areas and contexts, most often through problem-oriented lessons. In integrative approach, teachers design lessons that bring together learner's prior knowledge and experiences to support new knowledge and experiences. By doing this, learners draw on their skills and apply them to new experiences at a more complex level (Boix Mansilla, 2008).

Integrative approach addresses the need to develop integrative and creative thinkers who possess the 21st century learning skills of mastering the tools for learning and adapt learned knowledge and skills to create new knowledge and skills. Hence learners are expected to acquire new knowledge, be able to make connections and apply them in real life settings. In integrative approach, learners are expected to be able to organize facts and information and identify patterns as they relate them with their real life experiences. They are expected to make the connections between and among concepts coming from different disciplines or learning areas.

Why Integrative Approach?

Caine, R. N., & Caine, G. (1991) in their article, Making connections: Teaching and the human brain, noted a number of advantages in using Integrative approach. When learners are presented with facts in meaningful contexts that is, where students can find patterns and can relate it to their experiences, learning occurs faster and more thoroughly. They also noted that when experiences are more interconnected and relevant to the lives of the learners, the more the physical structure of the brain grows and develops. Thus, by connecting new knowledge to an existing knowledge or experience, students learn to organize information and learn concepts more effectively. Other strengths of Integrative approach include:

- Students who are exposed in integrative instruction made lessons more meaningful (Lamotte, 2018)

- The more integrated the subjects are, the more students find learning meaningful (Boyd and Hipkins, 2012)

- Integration helps to achieve retention and engagement in classrooms, which yields higher mastery of content standards

While Integrative approach has the potential to develop a more active, engaged, deep learners, it requires a more rigorous, carefully planned lessons anchored on a deep and broad understanding of the way Integration is designed within the curriculum. Teachers are expected to see the connection and articulation of what they teach in terms of competencies, knowledge and skills with other learning areas/ subjects . It requires careful planning and creative collaboration with other teachers especially when integration is interdisciplinary or multidisciplinary. As integration is both at the level of curriculum organization and lessons within a subject/learning area, it is important that teachers have a comprehensive understanding of how integration is designed within the curriculum and across subject/learning areas.

Integration in the K–12 Basic Education Curriculum

The K–12 Basic Education Curriculum, through its overall framework and the framework for the various learning areas, reflects integration as one of its pedagogical approaches. For instance, in STEM important principles in integration are embedded in its design. Among them are the following: 1) Integrated concepts and skills in Life Sciences, Physics, Chemistry and Earth Sciences–presented in Increasing levels of complexity (Spiral Progression). 2) Concepts and skills are integrated, stressing connections across science topics and other disciplines as well as applications of concepts and thinking skills to real life. 3) Integrating science and technology in the civic, personal, social ,economic and ethical aspect of life. 4) Strong link between science and technology and indigenous technology to keep cultural uniqueness and peculiarities intact.

The expanding learning environment which integrates *kasaysayan, sibika, ekonomiya, heyograpiya, pulitika at sosyolohiya* around common themes from K–10 illustrates how integration and integrative approach plays an important role in the Araling Panlipunan. Development of Macro and micro skills are likewise integrated across levels: *Pagbuo ng sariling Kahulugan at Pakahulugan, Pagsasalin sa Ibang Konteksto, Aplikasyon sa Tunay na Buhay, Pagsasagawa ng Tamang Aksyon o Hakbang*. Teachers are expected to design lessons around the themes and sub themes using the multidisciplinary perspectives.

On the other hand, Integration in the Language Arts and Multiliteracies to develop communicative competence and multiliteracies is very well articulated in the curriculum and reflected in the lesson exemplars. Among the principles that support integrative pedagogical approach include: 1) Areas of language learning such as the receptive skills, the productive skills, and grammar and vocabulary are taught in an integrated way to provide multiple perspectives and meaningful connections, 2) Integrated sub-strands (listening, speaking, reading, writing, and viewing) serve as building blocks for understanding and creation of meaning and for effective communication across curricula, and 3) Integration comes in different types either implicitly or explicitly (skills, content, theme, topic, and values integration).

In *Edukasyon sa Pagpapahalaga*, several themes are identified as organizing themes for integration: *Pananagutang Pansarili at Pagiging Kasapi ng Pamilya, Pakikipagkapwa at Katatagan ng Pamilya, Paggawa Tungo sa Pambansang Pag-unlad at Pakikibahagi sa Pandaigidigang Pagkakaisa, Pagkamaka Diyos at*
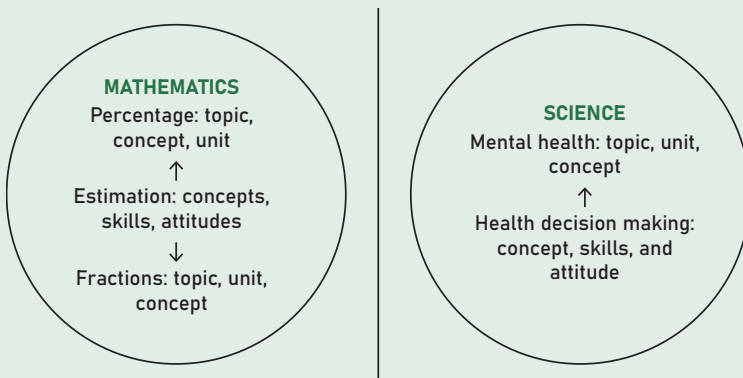
Preperensiya sa Kabutihan. These themes guide the way the knowledge, skills and values are organized across learning areas. Seven primary/major values are developed within these themes. These are: *Kalusugan at Pagkakaisa sa Kalikasan, Katotohanan at Paggalang, Pagmamahal at Kabutihan, Spiritwalidad, Kapayapaan at Katarungan, Likas Kayang Pag-unlad, Pagkamaka Pilipino, Pakikibahagi sa Pambansang Pagkakaisa*. Integration in Values Education does not only happen within the subject/ learning area itself but across learning areas and levels. Integrative pedagogies in Values Education provide the content and process for the different lessons.

Across and within learning areas, various integrative pedagogical approaches may be used. Robin Fogarty (1991) outlines the different approaches to integration in his book The Mindful School: How to Integrate the Curricula. Some specific strategies were given on how these types of integration can be done, alone, in partnerships with a teacher or in collaboration with more teachers. The next pages show some of the models for integration identified by Fogarty and illustrative examples of how these models may be adopted in teaching different subject areas.

FRAGMENTED

MATHEMATICS
Logical reasoning
Problem solving
Technology use
Estimation

SCIENCE
Research
Systems
Change/Evolution
Cause/Effect
Structure/Function

LANGUAGE ARTS
Grammar
Research
Genre study
Writing
Critical analysis

SOCIAL STUDIES
Map skills
Population/Environment
Geographical Feature

CONNECTED

MATHEMATICS
Percentage: topic, concept, unit
↑
Estimation: concepts, skills, attitudes
↓
Fractions: topic, unit, concept

SCIENCE
Mental health: topic, unit, concept
↑
Health decision making: concept, skills, and attitude

THREADED

MATHEMATICS

Cause and effect as
variable change

SOCIAL STUDIES

Current Events
Causes of war/effects

**THINKING SKILLS:
CAUSE AND EFFECT**

SCIENCE

Causes of air pollution
Effects

LANGUAGE ARTS

Diary of Anne Frank
Effect on family

SHARED

SCIENCE

LANGUAGE ARTS

Photosynthesis
Ecology
(ecosystem)
Conservation
(respect for ecosystem)
Flow charts

Cycles
Concept
Respect
Attitude
Sequencing
Skill

Interview
Biography
(life cycle)
Respect for point of view
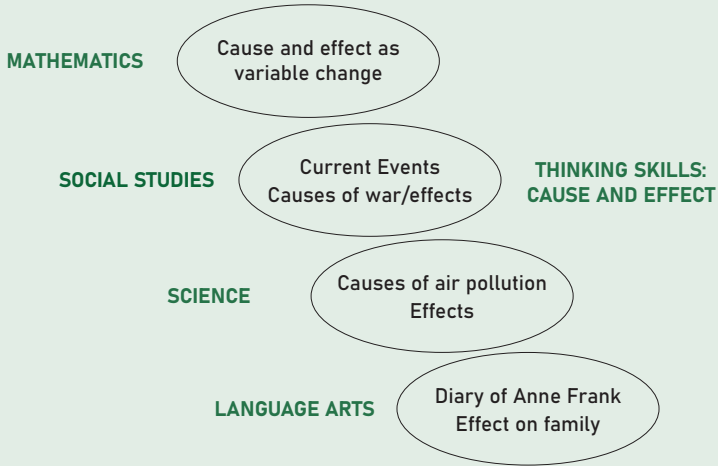**Plot line**
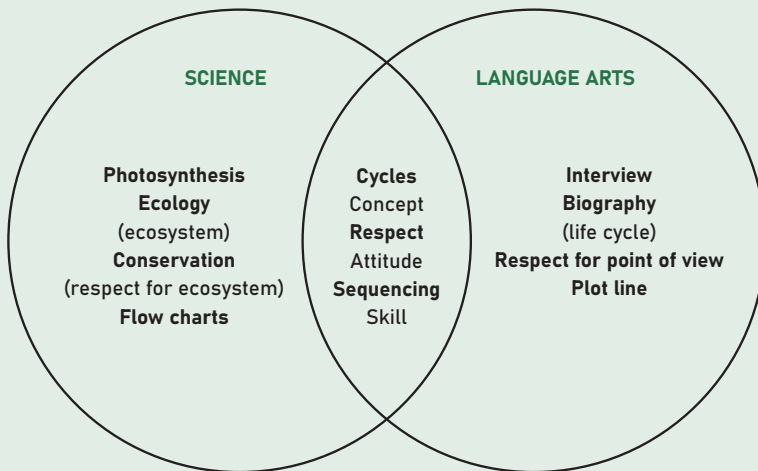
The previous illustrations are just one of the many ways by which integrative lessons may be done. Today integration of new perspectives and concepts such as global citizenship, disaster management, environmental education and multicultural education in lessons in different learning areas are part of our integrated curriculum.

Challenges to Integrative Pedagogical Approach.

As teachers continue to explore different strategies and approaches for integrative learning, a number of challenges need to be addressed. There is a need to discover and develop strategies for Integrative approach in different learning modalities (face-to-face, online and flexible learning). The new learning environment/ space and new technologies challenges teachers to design integrated lessons that maximize the use of technology and other resources for active student engagement. Development of holistic, meaningful thinking and application of transversal skills need to be emphasized. Lastly, there is the challenge to develop new tools and strategies for assessing integrative/holistic thinking, meaningful connection and creative solutions to problems. With all the challenges and limitations, integrative pedagogical approach is a dynamic, powerful and effective means to develop 21st century learners.

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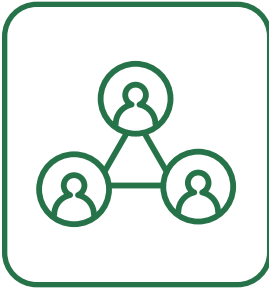
Collaborative Learning and Peeragogy

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As Marc Prensky put it, "Today's students are no longer the people our educational system was designed to teach." Majority of the teachers today are considered as digital immigrants because they learned how to use computers and browse the internet at some stage in our life. On the other hand, students were born during the digital age surrounded by computers, digital devices, and the internet.

There was a consensus among education experts that the current system of education could be likened to a factory from the industrial age where there is a well-defined input-output relation. Education used to be likened to economic theories where the school is a giant machine that the learners need to go through and come out to be the desired output.

However, that education paradigm has reached its end according to the experts. Specially in the recent years, the pandemic has forced educators to rethink curriculum and instruction, evaluation, and teacher preparation. There are three triggers that forced us to rethink education:

• Digital Learning – the expanding online world and the availability of ICT tools have relocated the place of the teachers in the classrooms. Digital tools have amplified what students can learn and from whom. These tools have also given rise to digital learning that is non-linear.

• Collaborative Learning – the purpose of the schools is to develop our learners—teaching the students ourselves and gradually fading to let the students break free from supervised teaching. This is when the teachers are not the only ones teaching them, but other people who can also meet their learning needs.

• Self-Determined Learning – when the students are more independently learning, we have successfully developed self-determined learners who have clear learning goals. These learners are intrinsically motivated, responsible, and can assess their own competency skills and levels they want to achieve.

Research have expanded and deepened our understanding of how learners learn. As teachers, we need to inform our practice with new understanding about how learners learn best, which boils down to active and interactive learning.

Why collaborative learning?

- Students learn better through collaboration than solo experiences (Vygotsky)

- Learning is social (Bandura), knowledge is socially constructed (Vygotsky)

- Knowledge lies not only within the individual but in the individual's physical and social environments

- What people learn, see, and do is situated in their role as a member of a community (Lave and Wenger)

- The connections that make it possible for us to learn in the future are more relevant than the sets of knowledge we know individually, in the present (George Siemens)

How do we facilitate the evolution of the Filipino learner from dependent to independent to interdependent learner?

There are three emerging pedagogies to approach this: heutagogy, peeragogy, and cybergogy. In particular, peeragogy is an approach focusing on collaborative learning and peer-to-peer teaching. It is an approach to learn something together and build on what each learner knows. Those engaged in collaborative learning capitalize on each other's skills and resources and are accountable for their co-learners in a learning community.

Collaborative learning may have some similarities with cooperative learning, but they are not exactly the same. Experts say that cooperative learning is for knowledge learning–it is good for mastering learning. On the other hand, collaborative learning is good for knowledge building. It is a continuum.

COMMON METHODOLOGIES BETWEEN COLLABORATIVE AND COOPERATIVE LEARNING

Plenary	Out-group
Pair	Personal learning network
Triad	Peer learning network /learning community
Big group	
Small group	

There are two critical concepts that we must remember on collaborative learning:

- Personal Learning Networks (PerLN) are the collections of people and information resources that people cultivate in order to form their own learning networks. For instance, we can build a personal learning network through social media. Our friends on Facebook or followings on Twitter will somehow influence what we have learned. That is why it is advisable to have diverse circles on social media who can provide us with diverse views so we can learn from them.

- Peer Learning Networks (PeerLN) are networks of people who share their profiles and work together to learn, teach, heal, and communicate. It is a community of learners who can learn from each other. The point of collaborative learning is helping our students to develop their own learning communities. This is not just a one-time strategy for a particular day or subject, but a strategy that needs to be designed at the start of the school year to embed the learning experiences early on. The learning experiences should be designed that the learner can learn not only from teachers, but also from parents, the community, their peers, and for them to develop and build their own personal learning networks like social media.

Just like in personal learning networks, teachers need to facilitate how learners can build their peer learning networks. Teachers need to help students identify their learning interests so that they can join learning communities relevant to them and amplify their learning opportunities and sources.

Peeragogy, a term coined by Howard Rheingold, is about believing that cognitive resources are shared socially. The following approaches constitute peeragogy:

- Peer-to-peer learning

- Collaborative learning

- Active and interactive learning

- Participatory learning

- Interdependent learning

There are five main models or components of peeragogy that teachers can use to design our course or subjects.

1. Discussion / Reflection Group. Teachers can form discussion and reflection groups among students to make it easier for them to understand the topic at hand. It will also help the learners build their confidence in speaking but it will also encourage them to think more critically.

2. Writing Group Collaborative Learning. Teachers can promote writing among learners through collaborative learning. It will help the learners refine their writing skills and get constructive feedback from their peers.

3. Problem / Project-Centered Collaborative Learning. Teachers can use problem-centered learning to promote collaborative learning through asking the students to solve a problem. It is a student-centered approach to learning through generating questions themselves.

4. **Peer-Teaching Collaborative Learning.** According to research, people learn best when they teach it to others. As teachers, we must provide opportunities to our students to be facilitator, presenter, or leader. This will increase their understanding of the subject and at the same time they will be able to collaborate with their peers.

5. **Learning Communities.** Teachers can encourage and guide learners in joining different learning communities they are interested in such as anime cosplay, superheroes, kpop, and many others. Learning communities motivate students to take an active role in their learning through working together with the members of the community they are part of.

Within the context of the pandemic, teachers had to utilize digital tools and platforms to bolster our practice of collaborative learning:

1. Communication and collaboration tools (e.g., Google Docs, Jamboard)

2. Information Search and Gathering tools (e.g., Google Search, Bing)

3. Content modification and calibration

4. Content creation and development (e.g., YouTube)

5. Responsible Digital Presence

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Constructivism:
From Theory to Practice

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Teachers use a lot of intuition in their classroom practices. Though the use of common sense intuitions has its own benefits, pedagogical decisions solely based on them may have some serious issues, such as unreliable prediction of what students need. Hence, there is a need as well to make our pedagogical decisions and practices theoretically grounded. One of the most well-known learning theories to date is constructivism. However, not all fully understand its nature and how it can be properly implemented at the classroom level. The following discussion, therefore, addresses this issue by providing a brief overview of learning theories and shedding light on the nature of constructivism as a theory and its application. It is hoped that you will be able to revisit and reflect on your current practices and find ways to make them theoretically grounded as well.

Before proceeding to constructivism, it is important to know the major learning theories and how they differ from one another. The first learning theory is behaviorism, which focuses on observable behavioral and its associated stimuli. It also argues that learning changes occur through the interaction between the stimuli and response. We also have cognitivism, which emphasizes the importance of learners' internal mental processes. This theory requires teachers to create an optimum environment that reduces cognitive loads. The third major learning theory is andragogy, which supports adult learning processes. It argues that adults are self-driven and have sufficient prior knowledge to solve complex problems within their environment. A more recent learning theory is connectivism that emphasizes the prominent role of technology and internet in facilitating learning. More specifically, this theory argues that learning is composed of many nodes (e.g., teachers, students, and infrastructure) and that all these nodes are connected and influence the success of learning. The last learning theory, constructivism, shall be the focus of the succeeding sections.

Constructivism is a learning theory which argues that students actively construct their own knowledge, and that reality is determined by their experiences as a learner. It also emphasizes that individual experiences make students' learning unique to them. In short, students are active participants in the learning process, and learn differently based on their own experiences. Constructivism is an overarching pedagogical theory. However, it may also refer to a specific approach drawn from constructivism, such as performance/task-based approach, project-based approach, problem-based approach, collaborative learning, reflective learning, inquiry-based approach,

THREE TYPES OF CONSTRUCTIVISM

1. **cognitive constructivism**: meaning is constructed based on interaction between new and current knowledge

2. **radical constructivism**: meaning is constructed through individual experience

3. **social constructivism**: meaning is socially constructed

and cooperative learning. There are three types of constructivism: cognitive, radical, and social. In cognitive constructivism, meaning is cognitively constructed by an individual based on the interaction between new and current knowledge through mental processes. It involves an accurate mental construction of reality. Conversely, radical constructivism argues that meaning is constructed through individual experience and that reality is relative to an individual. Both cognitive and radical constructivism are classified as individual constructivism. Unlike the first two, social constructivism emphasizes that meaning is socially constructed within a sociocultural context. Thus, it treats learning as a collaborative process and values how an individual interacts with his/her culture and society. While these three differ in many ways, they also share the same principles. All of them advocate that both teachers and students share knowledge and authority, that teacher acts as a facilitator, and that learning is collaborative, interactive, and cooperative.

When it comes to the role of teachers in a constructivist classroom, they are expected to do the following practices. First, teachers allow students to choose their own learning path. For instance, the teacher may show a product and let the students come up with their own approach of producing it. Second, teachers allow students to do or perform something to learn. This suggests the use of performance-based and experiential approaches to teaching. Third, teachers place a premium on social activity to facilitate learning. In this case, they do a lot of collaborative and interactive activities. Fourth, teachers contextualize the activities and concepts. Contextualization can be done through the concept of **GRASPS (Goal, Role, Audience, Situation/Setting, Product/Performance, and Standards)** which requires teachers and students to identify the goal, role of students, audience, setting or situation, performance or product, and standards for

ROLE OF TEACHERS IN A CONSTRUCTIVIST CLASSROOM

1. allow students to choose their learning path

2. use performance-based and experiential approaches to learning

3. do a lot of collaborative and interactive activities

4. contextualize the activities and concepts

5. encourage students to challenge their assumptions

a given task. Finally, teachers encourage students to challenge their assumptions. This concept is in line with the notion of transformative learning where learners are engaged in social and self-transformation.

To further implement constructivism in the classrooms, we need to consider six key concepts. These are project-based learning, collaborative learning, higher-order thinking, authentic learning, safe learning, and high-value assessment. One way to operationalize constructivism in the classroom is through project-based learning (PBL). Doing projects may be individual, in pairs, or in groups. When using PBL, consider the following practices: (1) Provide general but meaningful guidelines to allow students to explore their creativity; (2) Under-design projects to give some flexibilities to students; (3) Use authentic projects that are within students' social realities; (4) Employ process orientation because it increases student engagement. Another strategy to implement constructivism is through collaborative learning, where students are engaged in pair and group activity with clear roles. Teachers can engage students in a community of learners, negotiation, conversations, consensus-building, and peer feedback and mentoring. Tapping on the higher-order thinking skills of students would also be in line with a constructivist approach because it allows students to use creative skills, take multiple perspectives, engage in situational/case analysis, and concretize abstract ideas. One core feature of a constructivist classroom is authentic learning. By authentic learning, we mean the use of authentic tasks (e.g., news reporting, interview, business presentations, and bank transactions) and authentic materials (e.g., newspaper, TV programs, brochures, manuals, and recipes). To realize authentic learning, teachers are expected

**HOW DO WE OPERATIONALIZE CONSTRUCTIVISM
INSIDE THE CLASSROOM?**

1. Use **Project-Based Learning** in the classroom

2. Practice **collaborative learning** through pair or group activities with clear roles for each student

3. Tap on the **Higher-Order Thinking Skills** of students

4. Employ **authentic learning** to engage students in performing tasks and creating products that have practical application and relevance

5. Develop **assessment** tools that place **high value** on learning process and student participation

6. Foster and ensure a **safe learning environment**

to engage students in performing tasks and creating products that have practical relevance and contextualized. Teachers may also invite real-world experts or practitioners to facilitate class discussion. Assessment is another way to ensure that classrooms faithfully adopt constructivism. To do this, assessment tools have to be jointly created by teachers and students. Assessment activities should also accommodate the uniqueness of students' performance to meet the target competencies, should be flexible enough to allow students to revise their products and performances, and should place a high value on learning process and student participation. Finally, a constructivist classroom cannot be achieved without a safe learning environment. It is important that students are involved in creating classroom policies and consulted on their implementation. Teachers need to ensure that a culture of support is established, communication channels are open, and students are not humiliated and unnecessarily compared with other students.

In summary, constructivism has its advantages and disadvantages. We just need to use it purposively to make it relevant. As shown, effective teaching is not just an art, it is also a science based on established learning theory and its alignment with classroom practices. And because technologies continue to dominate the field of education, we might consider embracing other subtheories and theories like social constructivism and connectivism.

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