Sustainable Development Goals (SDGs) Integration in Lesson Planning Among Pre-Service Teachers

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ABSTRACT

Education for sustainable development through curricular integration is pivotal towards the achievement of sustainable goals. SDG must be taught as early as possible for the students to have a good grasp of contextualized and localized events and be able to learn how to propose solutions to societal issues and concerns. This study aims to determine the extent of cascading SDG in the lesson plans of pre-service teachers. The study utilized mixed-method design, documentary analysis to determine the extent of integration of SDG in the lesson plans and quantitative method to identify the barriers and opportunities encountered by the pre-service teachers which were obtained through a focus group discussion. In this study the 110 Bachelor of Elementary Education (BEEd) Major in General Education and Early Childhood Education pre-service teachers enrolled in their third year of the second semester, SY 2017-2018 was used as respondents. This study was conducted in a Teacher Training Institution (TEI), a state university in Cebu City. Results revealed that SDGs had a low-level integration in the lesson plans of the pre-service teachers, yet, the concept of the multidisciplinary approach was laudably used across various disciplines. Nonetheless, there were cognitive, affective and psychomotor barriers identified along with the integration, hitherto the opportunities experienced by the respondents outweigh the barriers. The sustainability of the earth making it available for the future generation is the concern of everybody. The role of the academe is paramount in the development of lifelong learners particularly in making living sustainable and curricular integration of SDG across discipline is deemed necessary. This study recommends that SDG must be integrated across disciplines, to break disciplinary "silos" in addressing societal issues and that pre-service teachers must give social contexts to the lessons.

Keywords: Sustainable Development Goals; Lesson plan; Pre-Service Teachers; Multidisciplinary approach; Curriculum Integration

INTRODUCTION

The pre-service teachers are associated with molding the learners and have the chance to think critically and propose measures to accomplish the 17 Sustainable Development Goals. Environmental studies are important to children to create a feeling of administering to the indigenous habitat, non-living being, and common assets. Youngsters along these lines would relate to a feeling of association towards its immediate environs. Experience is likewise an extraordinary help in creating capacities of a youngster and further reiterated that play as a technique in instructing Early Childhood Education (ECE) understudies is helpful in the teaching and learning process. Instruction is not, an issue of training as a rule, yet splendid instruction requires accomplished educators. Essential training must have supportability incorporation to shape children in making a reasonable society, thereby requiring a multidisciplinary approach to realize the goal of UNESCO (Kelly, 2013).

Integration of SDG in Education

The United Nations General Assembly has adopted the 2030 Agenda for Sustainable Development (UN, 2015) and the framework directs humanity toward a sustainable path. There were 17 SDGs highly considered as major
development challenges crucial for humankind's survival. Said goals are directed as follows: Goal 1: End Poverty; this is more than the income but rather an economic growth to provide sustainable livelihood and promote equality and social protection. Goal 2: Zero hunger, achieve food security and improved nutrition and promote sustainable agriculture. All forms of malnutrition and hunger must be halted by 2030, alongside; agricultural productivity must be supported by resilient agricultural practices. This will ensure sustainable food production. Goal 3: Good Health and Well-being; It targets the reduction of mortality, the end of epidemics and prevention and the promotion of mental well-being. Goal 4: Quality Education; The goal attributes the education sector as an arm to ensure access to equitable quality education and lifelong learning opportunities for most particularly the marginalized and the vulnerable sectors. Goal 5: Gender equality: The goal advocates equality and elimination of violence for all gender.

Goal 6: Clean Water and Sanitation; considered as a human right plays a crucial role in sustainable development. The main target is to improve water quality and sustainable use of water resources. Goal 7: Affordable and Clean Energy; The goal advocates for modern, reliable and affordable energy services by promoting energy infrastructure and energy technology. Goal 8: Decent Work and Economic Growth; Employment and economic development are crucial to desperate poverty. The goal is a challenge for economic growth and resource efficiency without environmental degradation. Goal 9: Industry, Innovation, and Infrastructure; Investments on sustainable infrastructure generate jobs that will eventually promote economic growth, hence the need to promote environmentally sound technologies is deemed necessary to advance industrialization. Goal 10: Reduced Inequalities; This is seen as an obstacle to sustainable development and in fighting poverty considering that it limits opportunities for social groups within and among countries. It envisages better representation for developing countries within international, financial and economic organizations. Goal 11: Sustainable Cities and Communities: With the rise of industrialization, people plunge to live in the cities, where the prosperity hub is concentrated. Thus, the call for a more inclusive and sustainable form of urbanization will ensure universal access to a safe environment. Goal 12: Responsible Consumption and Production; The consumption of the world has exceeded the carrying capacity of what earth can provide, this goal promotes sustainable practices on consumption and procurement. Goal 13: Climate Action; the global warming of the earth creates repercussions that may threaten large sections of the population. This is a call to countries to incorporate climate protection measures on national policies and to strengthen the resilience of countries towards climate-related disasters. Goal 14: Life below Water; the increased population has led to pollution and overexploitation of aquatic resources resulting in a threat to aquatic life forms. It is the intention of this goal to advocate sustainable use of the marine ecosystem, upholding the resilience and restoration of a healthy and productive marine environment. Goal 15: Life on Land; the sustainable use and conservation of biodiversity are vital to humanity's survival; hence the calls to halt deforestation, desertification, and biodiversity protection are urgent measures to protect the planet and biodiversity. Goal 16: Peace and Justice Strong institutions; Effective governance, inclusive and peaceful communities are pivotal in achieving sustainability. It is purported in this goal to reduce all forms of violence and crimes and to guarantee equal justice for all.

Goal 17: Partnership for the Goals; the global partnership of the countries calls for their commitment to allocate budget to development assistance to reduce dependence on foreign support, further to the international partnership on Science, technology and innovations and the advancement of the multilateral trading scheme. An investigation directed by Peter et al. (2016) expressed that schools must give Sustainable Development (SD) related projects as an approach to expand SD mindfulness among the pre-service teachers. Instructors ought to insert SD ideas in teaching and learning delivery. Incorporating SD ideas in the colleges' educational programs will empower them to rehearse manageability and enhance capability on how societal issues may be resolved.
METHODOLOGY

This study utilized a mixed-method design, to determine the extent of integration of SDG in the lesson plans of the pre-service teachers the documentary analysis (Bowen, 2009) qualitative method was used. The quantitative method was used to identify the occurrence of SDG on lesson plans and the barriers and opportunities encountered by the pre-service teachers, and this was obtained through a focus group discussion. In this study, the pre-service teachers are in their third year second semester, SY 2017-2018. This study was conducted in a Teacher Training Institution (TEI), a state university in Cebu City during the second semester, in one of their subjects wherein lesson planning was taught. Students were assigned topics for the whole second quarter from which they can base their lesson plans, and the faculty in-charge reiterated that SDG must be integrated into the course of the lessons and the topics and subject areas were pre-assigned. The 110 students of Bachelor of Elementary Education (BEEEd) Major in General Education and Early Childhood Education majors were randomly selected among the 520 third-year students enrolled for SY 2017-2018.

RESULTS AND DISCUSSION

The SDGs have strong relevance to the degree programs considering that it covers a wide range of social, economic and environmental sustainability across nations. A pre-Service teacher embedding SDG’s in their plan is essential to address the critical issues of society. The figure that follows presents the SDG integration in the lesson plans. There are 110 lesson plans consolidated among the pre-service teacher respondents, with topics derived from the second quarter. Results revealed that SDG’s were integrated into the lesson plans across disciplines. The SDG goals which includes: Goal 1: End Poverty; Goal 2: Zero hunger, food security and improved nutrition; Goal 3: Good Health and Well-being; Goal 4: Quality Education; Goal 5: Gender equality; Goal 6: Clean Water and Sanitation; Goal 8: Decent Work and Economic Growth; Goal 9: Industry, Innovation and Infrastructure; Goal 10: Reduced Inequalities; Goal 11: Sustainable Cities and Communities; Goal 12: Responsible Consumption and Production; Goal 13: Climate Action; Goal 14: Life below Water; Goal 15: Life on Land and; Goal 16: Peace and Justice strong institutions, might be topics wherein a pre-service teacher is well versed. The integration of real-life scenarios to the lesson is termed as contextual teaching, and learning approach by Rahma (2018), here subject matter content is related to meaningful situations relevant to student's lives. Educators must, therefore, anchor their pedagogical strategies on SDG's relating it to the meaningful events in the life of the learners.

Below is a sample lesson plan in Physical Health made by one of the pre-service teacher wherein SDG 3, health and well-being was integrated.
SDG Integration in Lesson Plans

A Lesson Design in Physical Health - Grade 1

Topic: Parts of the Body (SDG Goal 3 - Good Health and Well-being)

Activity: Students will sing the song, “My Toes, my knees.”

Discussion Questions:
1. What are the parts of the body mentioned in the song?
2. How do you take care of the following: Toes, knees, etc.?
3. What will happen if we will not take care of the body?

Follow-Up Activity
The class will be grouped into five, and then, the teacher will give each group Meta cards on the parts of the body. The learners will demonstrate to the class how they should take care of the specific body parts assigned.

Enrichment Activity
The teacher will demonstrate how to take care of simple skin wounds/abrasion using the first aid kit, and each learner will give a return demonstration.

The song is very familiar to the students hence it is a good springboard to start the lesson. The groupings made the learners familiar and are very concrete in the demonstration of how the body must be taken care of; while the simple wound dressing will train the young learners on first aid should they or anyone incur a simple abrasion/wound. The Grade 1 lesson is relevant and meaningful to the learners considering that children are very playful and must be mindful of the proper care of the body.

It is noteworthy to mention that the 15 sustainable development goals were given emphasis however Goal 7 Affordable and Clean Energy and Goal 17 Partnership for the Goals were not embedded at all. Pre-service teachers have not integrated these two goals probably because it was seen as complex wherein pre-service teachers have no prior experience yet. This observation is affirmed in the theory of connectionism by Thorndike which states that connections are strengthened when practiced. Pre-service teachers might not have connections yet on the scope of these goals; hence they cannot contextualize and apply in their lesson plans. Thus, the need for mentors and teacher trainers for more emphasis on Goals 7 and 17 in lessons is needful.

Across the 110 lesson plans none was devoted to Goal 7 and 17; hence sample outputs are herein presented to confirm the possibility of integrating these in the lessons. The lesson plans were researcher-made.
# A Lesson Design in English IV

**Topic:** Getting the Main Idea and the Supporting Details  (**SDG Goal 7 Clean Energy**)

**Activity:** Students will be given a short essay entitled, “Why Do We Need to Save Energy?”

**Discussion Questions:**

1. What’s the selection all about? (Saving Energy)
2. What’s the importance of conserving energy? (varied answers)
3. What do you call the topic being talked about in the selection? (main idea)
   1. What is the function of the main idea? (It summarizes the author’s primary message.)
   2. How about those who support the main idea, what do you call them? (supporting details)
   3. What is the difference between the main idea and the supporting details? (varied answers)

**Follow-Up Activity**

The class will be grouped into five, and then, the teacher will give each group a comic strip and the pupils will get the main idea out of that comic strip. They will write their answers on the Meta cards.

**Enrichment Activity**

Write a five-sentence essay that can demonstrate how to save energy at home.

The lesson design in English utilized an **essay as a lead to the lesson towards clean energy.** The guide questions are exploring the development goals while discussing the English competency on the main idea and supporting details. The topic is relevant to the learner, contextualized and was localized. Another sample lesson plan in Mathematics IV is herein proposed wherein the development goal on global partnership was integrated.
In the lesson plan above, Typhoon Haiyan (Yolanda) was used to integrate Goal 17 in Mathematics Grade IV; the lesson plan utilized the meaningful event in the country in 2013. Both degree programs must contextualize and localize (Republic Act 10533) lessons based on the most challenging issues or meaningful events of the place or the country.

Moreover, the concept of a multidisciplinary approach is used in the integration of SDG both in Grade IV English and Mathematics lesson plans. Through this approach, the combination of knowledge from various disciplines will result in application-oriented and practical knowledge (Besselaar and Gaston, 2001) breaking down the disciplinary "silos" to address the complex societal issues (Kracht, Robson, and Macleod, 2013). The subject coordinators must encourage teachers on the multidisciplinary approach in discussing societal issues.

Moreover, goals that are not integrated (Goal 7 and 17) may be due to its complexity, in as much as complex lessons cannot be taught to students who were on the kindergarten level. According to Piaget's Cognitive Theory, lessons should be taught according to the appropriate developmental stage of the learners; thus complex lessons and sensitive issues are not yet appropriate to teach in the kindergarten and early elementary level. Nevertheless, other most appropriate development
goals must be given concrete and meaningful examples of lesson implementations. The table that follows presents the subject matter and topics wherein SDGs were integrated.

Table 1: Integration of SDG across the disciplines

<table>
<thead>
<tr>
<th>Sustainable Development Goals</th>
<th>Subject Matter and Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: No Poverty</td>
<td>Filipino 6: Kahulugan ng mga Tambalang Salita</td>
</tr>
<tr>
<td>Goal 2: Zero Hunger</td>
<td>Filipino 6: Kahulugan ng mga Tambalang Salita Science: Go, Grow and Glow Foods</td>
</tr>
<tr>
<td>Goal 5: Gender Equality</td>
<td>English K: The Community Workers</td>
</tr>
<tr>
<td>Goal 6: Clean Water and Sanitation</td>
<td>Science 3: Sensory Organs-Skin Science 4: How to Take Care of Our Oceans/Marine Environment Science 5: Environmental Problems Science 5: Human Reproductive System Filipino 6: Kahulugan ng mga Tambalang Salita</td>
</tr>
<tr>
<td>Goal 8: Industry, Innovation, and Infrastructure</td>
<td>English K: The Community Workers English K: The Places in the Community</td>
</tr>
<tr>
<td>Goal 9: Reduced Inequalities</td>
<td>English K: The Community Workers</td>
</tr>
<tr>
<td>Goal 10: Sustainable Cities and Communities</td>
<td>English K: The Places in the Community</td>
</tr>
<tr>
<td>Goal 11: Responsible Consumption and Production</td>
<td>Science 2: Plants and Animals in the Community</td>
</tr>
<tr>
<td>Goal 12: Climate Action</td>
<td>Science 6: Preventing Pollution</td>
</tr>
<tr>
<td>Goal 13: Life Below Water</td>
<td>Science 2: Plants and Animals in the Community Science 4: How to Take Care of Our Oceans/Marine Environment</td>
</tr>
<tr>
<td>Goal 14: Life on Land</td>
<td>Science 1: Save the Earth- Recycle Science 2: Plants and Animals in the Community Science 3: Caring for the Pets Science: Plants Science: Plants Edukasyong Pagpapakatao: Pagkakaroon ng Disiplina, Kalinisan at Kaayusan</td>
</tr>
</tbody>
</table>

It is observable that development goals were integrated on various subjects like Filipino, Science, English, Physical Health, HELE, Language, Mathematics, Edukasyong Pagpapahalaga, and Araling Panlipunan. A multidisciplinary approach in the integration of the development goals was made possible, with emphasis on societal issues viewed from various disciplinary viewpoints.
Hence, the clamor that only the science subjects are the most appropriate subject for SDG integration has become fallible, and rather the development goals comprise an array of relevant societal concerns imperative to improve the world and face challenges.

Considering the data presented in Figure 1, the average of 2.94% integration for both BEED and ECE degree programs landed on the very low level of integration only. This may be attributed to the capacitation of skills and capabilities of the pre-service teachers and the moral capacity of the educators. The pre-service teachers need more exposure and predisposition to how sustainability goals are related to societal issues and how this may be solved. Unless they are trained in solving societal problems they cannot cascade it to the teaching and learning process. On the other hand, educators also have their moral capacity to commit to train critical thinking and lead pre-service teachers to educational decisions in providing innovative solutions to societal issues. Education is paramount to the achievement of sustainable goals, and it is envisioned that the SD framework will help in the development of responsible and resilient citizenry (Commonwealth, 2017).

### Barriers and Opportunities Encountered

Thematic content analysis categorized the barriers encountered by the respondents along with the three domains of learning: cognitive, affective and psychomotor.

<table>
<thead>
<tr>
<th>Cognitive Domain Barriers</th>
<th>Frequencies N=110</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application to real life</td>
<td>80</td>
<td>72.72</td>
</tr>
<tr>
<td>New to the concept</td>
<td>20</td>
<td>18.18</td>
</tr>
<tr>
<td>Not applicable</td>
<td>10</td>
<td>9.09</td>
</tr>
<tr>
<td>Affective Domain Barriers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appreciation of societal issues</td>
<td>40</td>
<td>36.36</td>
</tr>
<tr>
<td>Application of most appropriate values</td>
<td>30</td>
<td>27.27</td>
</tr>
<tr>
<td>Not applicable</td>
<td>30</td>
<td>27.27</td>
</tr>
<tr>
<td>Psychomotor Domain Barriers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of Activities</td>
<td>50</td>
<td>45.45</td>
</tr>
<tr>
<td>Consideration of Multiple Intelligences</td>
<td>30</td>
<td>27.27</td>
</tr>
<tr>
<td>Not applicable</td>
<td>20</td>
<td>18.18</td>
</tr>
</tbody>
</table>

Two themes emerged as cognitive barriers. Respondents found that their greatest barrier is to relate a development goal to real-life scenarios (80%) while 20% of the respondents found SDG as a new concept. The theory of “habitus” by Trier (2002) asserts that pre-service teachers have a tendency not to connect the lessons to real-life. Pre-service teachers are culturally ingrained in their born environment and having a new experience makes it difficult for them to expound new concepts in the lesson. Further, Kimori (2017) affirmed that teachers acknowledge the importance of integrating sustainability issues in the classroom but continue to struggle with conceptual barriers to create a successful integration of sustainable and environmental topics. In line with this, TEI's should conduct further training about SDG for pre-service teachers to have SDG applications automatic.

Inculcation of societal issues and application of most appropriate values were perceived as burdensome by the pre-service teachers in the affective domain. Classroom lessons must create social contexts, and pre-service teachers must be aware of its existence; this skill is left out as a barrier by the pre-service teachers. The myriad of issues in society needs to be faced by young learners with a solution. The capability to think and reason critically, demands an interrelated, rich, domain-specific knowledge (Anderman and Sinatra, 2012). Appropriate values must also be applied in teaching the development goals knowing that building values and compassion in children leads to passionate, engaged adults (Levy, 1993). The fast tempo of knowledge generation deems it a necessity that the citizenry is more resilient in their thinking. The values inculcated in the classroom must be adept at the changing landscape of societal challenges. Along with this line, TEI's must emphasize strongly on awareness of social issues and constant application of values for the pre-service teachers for them to be well accustomed to this needful knowledge.

Emerging themes in the psychomotor barriers include the development of activities and consideration of multiple intelligence. Mello and Less (2013) active and hands-on learning are consisting of specific structured activity which promotes greater learning involvement of the students. Thus, TEI's must utilize active learning...
utilizing activities that will cater to various intelligence of the students.

**Opportunities Encountered in the Integration of Sustainable Development Goals**

Despite all the hardships and hindrances of the pre-service students, they maintained a positive outlook in integrating SDG into their lesson plans.

**Table 3. List of opportunities in Integrating SDG in lesson plans**

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Frequencies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning new knowledge and skills</td>
<td>21</td>
<td>19.09</td>
</tr>
<tr>
<td>Lifelong learning</td>
<td>23</td>
<td>20.90</td>
</tr>
<tr>
<td>Contribute solutions to the societal issues</td>
<td>12</td>
<td>10.90</td>
</tr>
<tr>
<td>Real-life applications</td>
<td>34</td>
<td>30.90</td>
</tr>
<tr>
<td>Produce productive and resilient citizens</td>
<td>20</td>
<td>18.18</td>
</tr>
</tbody>
</table>

In this part wherein values are integrated, the respondents have many opportunities encountered. There are two most emerging themes that the respondents believed to be the most integral part of teaching. The first opportunity in the integration of SDG in the lesson plan is that teachers can share the importance of different natural resources and the significance of the various aspects of the country whether it is environmental, economic or educational. By sharing to the students the importance of these, they hoped to imprint to the young minds of the learners the importance of being a responsible citizen of the country. This finding is affirmed in the study of Wibby (2016), which states that the youngest members of society may take part in achieving the target of sustainable living.

The second common opportunity is to produce life-long learners. To produce this, the teacher must impart the necessary skills for survival and skills to have a sustainable community. According to Weeks (2017), when students learn about SDGs such as those about poverty, hunger, and high-quality education, they begin to understand the unique challenges facing communities all over the world that they may not have known about before.

**CONCLUSION**

The sustainability of the earth making it available for future generations is the concern of everybody. The SDG curriculum integration may be done on a multidisciplinary approach, contextualized and localized to be meaningful to the learners. The mandates of Bachelor of Elementary Education aims to develop highly motivated and competent teachers on pedagogy and content for elementary education (CMO 74, series of 2017) while Early Childhood Education (ECE) is to prepare individuals for teaching and supporting young children’s development (CMO 76, series 2017). One of the expected program outcomes is the manifestation of substantive and comprehensive pedagogical content knowledge of different subject areas. It is along this line wherein a pre-service teacher must be kept abreast of social issues both at the local and global context and are tasked to connect lessons to real-life experiences. However, crucial to the success of the SDG integration is the moral commitment of the educators to train pre-service teachers to educational decisions leading to innovative solutions. On the whole, the role of the academe is paramount in the development of lifelong learners particularly in making living sustainable and curricular integration of SDG across discipline is deemed necessary.

**RECOMMENDATIONS**

Based on the results and findings of the study, the following are hereby recommended:
1. SDG must be integrated across disciplines, to break disciplinary "silos" in addressing societal issues.
2. All sustainable goals must be emphasized lessons, most notably the goal 7 and 17. The accomplishment of the development goals may ensure sustainable earth and resilient citizenry.
3. Pre-service teachers must are exposed continuously to connecting lessons to a real-life scenario for them to be well accustomed to needful knowledge.
4. The Teacher Education Institutions (TEI's) must institutionalize SDG integration in the curriculum and give training exposures to the
faculty members on how the development goals may be realized.

REFERENCES


