Collaborative Learning in Practice; Enhancing Students’ Involvement in Sustainability and 2030 Transformational Plan: PSU Go Green Campaign as an Example

Prof. Hadeer Aboelnagah  
College of Humanities  
Prince Sultan University  
Riyadh, KSA  
habouelnagah@psu.edu.sa

Dr. Walaa Metwally  
Architectural Engineering Program  
Prince Sultan University  
Riyadh, KSA  
wmetwally@psu.edu.sa

Abstract
While sustainability simply means maintaining resources for future generations, it is hard to imagine the success and continuity of any plan of sustainability without the active inclusion of the leaders of the future. Furthermore, as enhancing the quality of living is one of the main programs fostered by Saudi 2030 vision, increasing societal awareness and involvement in adopting lifestyle changes becomes of crucial importance. In alignment with Prince Sultan University strategic plan, the Environment students club took the initiative of a comprehensive campaign under the title of Go Green I & II (2017 & 19 respectively). The campaign aims at enhancing students’ involvement to adopt green living and recycling concepts in daily life. It also aims at reducing waste and transforming the campus to an environment friendly domain. More importantly the campaign fosters students’ leadership by enabling students to take the initiative and create, invent and implement the targeted changes which guarantee continuity and sustainability.

The current study examines the experiment employed at the campaign and proposes pedagogical measures that maintain the achievements and augment students’ involvement in the future. Adopting multidisciplinary dialogic methodology, this case study briefly demonstrates the pedagogical approaches selected in the campaigns such as implementation of zero paper courses, and designing contemporary and efficient recycling pins. Employing the theoretical concepts of collaborative learning and green design frameworks this paper aims at: 1) examining the Go Green Campaign and its alignment with PSU’s strategic plan and the Saudi 2030 National Transformational Plan, 2) investigating the pedagogical approaches employed such as collaborative learning and their effectiveness in reaching assigned goals, 3) proposing future approaches to enhance students and societal involvement in implementing sustainability and green living procedures.

Keywords  
Sustainability, green living, Go Green Campaign, Collaborative learning, National Transformational Plan

Introduction
We are living in a time of unprecedented risk but also an unparalleled opportunity for the future of our planet and our society. With increasing pollution, change in migratory patterns, and the rise of human population, many ecosystems are in danger. Inspired by Kingdom of Saudi Arabia plan of 2030, the first main pillar of the plan is the sustainability and reservation of energy in addition...
to enhance the sense of patriotism and identity among young generation. As the strategic plan of Prince Sultan University aligns with the main concepts of the National Transformational Plan (NTP), increasing efforts are exerted in the direction of augmenting students’ involvement in the transformation into greener and more sustainable society. The Go Green Campaigns aims at enhancing sustainability and go green living at Prince Sultan University. Both Go Green I&II mainly aim at enhancing students’ and societal awareness of three main concepts that come at the core of green living which are; Reduce, Reuse and Recycle. With the implementation of Go green I on 2017 a considerable awareness of the main concepts was achieved in addition to the collection of 1 tone of recycled papers and sell them to a local company. Currently, as the Environment students club is leading the phase of Go Green II, a deeper understanding of the concepts is expected and a collection of 5 tones is the new target. More importantly is enhancing the involvement of the students in applying the concepts of sustainable design through a designing contest of recycling pins for different waste substances. Transformational pedagogical approaches are also suggested to implement greener concepts into daily practices. This case study examines the effect of participatory approaches in transforming students from passive agents into active contributors in the environmental awareness campaigns. It is historically proven from earlier researches such as those conducted by; Anna R Davis and others 2011, Carolyn Stevenson and Joanna C. Bauer 2014, Maria Daskolia, Chronis Kynigos and Makari Katerina 2015 that collaborative approaches in teaching environmental projects lead to more sustainable results. Employing the theoretical concepts of collaborative learning and green design frameworks this paper aims at: 1) examining the Go Green Campaign and its alignment with PSU’s strategic plan and the Saudi 2030 National Transformational Plan, 2) investigating the pedagogical approaches employed such as collaborative learning and their effectiveness in reaching assigned goals, 3) proposing future approaches to enhance students and societal involvement in implementing sustainability and green living procedures.

Green design/ Sustainability, Collaborative Learning Pedagogical Approach

As our climate is changing a more adaptable considerations are to be in place to become healthier. Also, greener environment applications are to put in consideration protecting plants, water, energy, climate, electricity, ......etc. Therefore, environmental sustainability as a field became one of the most important enters that expands and grows in the coming years. Such budding field focuses on changing people’s lives to benefit rather than degrade the health of humans and the environment with economic and political indicators. Since the 1990s, the media has often talked about “green” or “sustainable” design. Green design or sustainability can be defined as: “Eliminate negative environmental impact completely through skillful, sensitive design” it is an approach to building or designing products that minimizes harmful effects on human health and the environment. It can also be defined as “The process of people maintaining change in balanced environment, in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations”.

Sustainability attempts to reduce the collective environmental impacts during the production of building components, during the construction process, as well as during the life of the building.

1 - Roben Beaver, (2005), Mainstream Green sustainable Design By LPA, Australia, p 10
2 McLennan, J. F. (2004), The Philosophy of Sustainable Design, a,b
3“What is sustainability”, www.globalfootprints.org, Retrieved 2 May 2018
(heating, electricity use, carpet cleaning etc.)\textsuperscript{4}. This design practice emphasizes efficiency of heating and cooling systems; alternative energy sources such as solar hot water, appropriate building sitting, reused or recycled building materials; on-site power generation - solar technology, ground source heat pumps, wind power; harvesting for gardening, washing and aquifer recharge; and on-site waste management such as green roofs that filter and control storm water runoff. \textsuperscript{5}

Sustainable design refers to both a structure and the using of processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from sitting to design, construction, operation, maintenance, renovation, and demolition\textsuperscript{6}.

**Green Building/ sustainability and the environment:**

There are many benefits of green design that improve and preserve the health for people and environment to reduce the impact of the buildings have on environmental degradation and it is better in the long-run.

Moreover, the sustainable environment has financial and personal benefits to create buildings and homes that benefit rather than degrade the health of humans and the environment, as water-efficient fixtures reduce water bills and use of insulation with a high heat resistance rating reduce heating costs. The Green designs can be found if:

- Recycling or reusing most of its construction waste rather than sent to landfills.
- Designing the ventilation systems for efficient heating and cooling
- lighting the energy-efficient and appliances
- Reducing the consumption (and costs) of energy and water.
- Maximizing the passive solar energy in the Landscapes plan
- Minimal harm to the natural habitat
- Alternating the power sources such as solar power or wind power
- using non-synthetic, non-toxic materials inside and out
- Eliminating long-haul transportation Locally-obtained woods and stone,
- Reducing the consumption of natural resources, like wood from old growth forests.
- Using high efficient HVAC systems and low VOC (Volatile organic Compound) materials like paint, flooring, and furniture to improve the indoor environmental air quality.
- Adaptive reuse of older buildings
- Efficient use of space
- Maximizing the optimal location on the land, sunlight, winds, and natural sheltering

Most green design do not have all of these features, but in order to achieve sustainability or becoming "green", the highest goal of green architecture is to be fully sustainable. For the sake of this particular case study, a specific focus will be given on recycling practices and the adoption of such concepts in students’ projects.

**Go Green/ The Saudi 2030 National Transformational Plan, and Prince Sultan University strategic plan:**


\textsuperscript{6} - http://www.epa.gov/greenbuilding/pubs/about.htm

© IEOM Society International
Enhancing the quality of living is one of the main programs fostered by Saudi 2030 vision, Saudi Arabia is committed to achieving sustainable development, and the Kingdom’s Vision 2030 plans fall in line with the economic, social, and environmental dimensions of sustainable development.

Hence, the Kingdom continues to strengthen its measures on climate change, toward the full implementation of the Paris Convention. In addition, it continues its cooperation with other GCC countries to meet global, environmental, and climatic challenges related to fossil fuel uses. Therefore, increasing societal awareness and involvement in adopting life style changes becomes of crucial importance. In alignment with Prince Sultan University strategic plan,

**Go green** refers to both a structure and the using of processes that are environmentally responsible and resource-efficient, construction, operation, maintenance, renovation, and demolition. All of these require close cooperation of the team work at all project stages, from project selection, scheme formation, material selection and procurement, to implementation. Go green can be achieved by:

- Create sustainable green design that becomes of durable value to the society and culture and also users which have been create to them.
- Integrate Sustainable Green design including energy efficiency, water conservation, and healthy indoor air quality and increase the value and environmental integrity of our designs.
- Save Energy and Use Renewable Energy by incorporating energy efficiency into projects and assessing the efficiency of existing equipment.
- Reduce future operation and maintenance costs.
- Continuity cooperation of team designers, engineers, and the client at all project stages, from site selection, scheme formation, material selection and procurement, to project implementation.

**GO GREEN Campaign**
The PSU Environment students’ club took the initiative of a comprehensive campaign under the title of **Go Green II** in the academic year 2018/19, The campaign aims at enhancing students’ involvement to adopt green living and recycling concepts in daily life. It also aims at reducing waste and transforming the campus to an environment friendly domain.

**Collaborative environmental projects for PSU students**
Students were asked to design recycle bins through Go Green Campaign in order to enhance the practices of students and faculty members on campus and encourage recycling in alignment with PSU’s strategic plan and the Saudi 2030 National Transformational Plan through employing the theoretical concepts of collaborative learning and green design frameworks.

---

Go Green Campaign suggested a students' competition to design recycle bins which will help to protect the environment and reduces the need for extracting, refining, and processing raw materials which create sustainability and less of water pollution. The design criteria was chosen for this project based on designing the indoor and outdoor recycle bins to contribute to the recycling process, and that they would be distributed everywhere in the university and employees should be aware of their importance. Additionally, the design should consider the materials and the colors according the international color code of recycling, in addition the creativity in the design, easy to construct, and maintain are required, and any extra criteria can be suggested by the designers.

Designing custom made recycling pins aimed at involving the students with interaction teaching material to solve real life problems and to find the best design solution which offering Sustainability and green living procedures. The students were asked to work in groups to create their projects and products that meet the present needs, also reducing the future operation and maintenance costs through different stages from project selection, scheme formation, material selection, and procurement.

19 students participated in the campaign, they were merged and formed in groups which resulted in 7 different projects, each group shared their positive and negative contribution, developing and improving their work skills.

This experience followed different phases at all project as follows:

**Phase 1:** Each group conducted research that seeks to improve the existed recycle bins by identifying problems and needs to find the best design solutions for the recycle bins. The groups interviewed many students at the PSU campus to hear about their experiences and opinions about the available solutions at the university, then they analyzed the results of their research and ended with some recommendations that will help them to identify the problems to find the best design for indoor and outdoor recycle bins in order to meet the goals of the healthier and greener environment.

**Phase 2:** Students were guided to prepare the design for recycle bins, describe the materials required, and include the working drawing, details, mechanism, and maintenance as needed.

**Phase 3:** Students were guided to implement and exhibit their work with extending the invitation to the experienced members to evaluate the work. The exhibit was part of the Go Green II promotional campaign, activities included green living ideas, recycling options, and healthy products which support the aim of the campaign.

The experience was useful for the students enabling them to present their final projects in GO Green Campaign and receiving feedback from experienced members who were invited to the exhibition to evaluate and develop their learning experience. The diversity of attendees resulted in a ray of questions and compliments which inspired the students to provide answers on their creativity products, in addition they benefited from the varied
feedback of such a wide variety of visitors. The experiment provided example of enhancing student’s involvement in the recycling process and environment awareness. The experiment fostered collaborative creativity in learning and enhance understanding about sustainability (Daskolia et al 389). Many concepts were employed here to augment the learning experience of students which in turn lead to more sustainable results in the educational process and the environmentally friendly practices.

Figure 1: Photos for the GO Green Campaign Day, included the exhibition and students’ suggestions

The following pictures showed PSU recycle bins suggested by students
Figure 2 (a & b): Outdoor recycle bin, to get users attention through the modern design of the seat and let them wonder about each box, the design integrates deferent function (seat, green plant pots, and Recycling trash) in one piece, Related on organic natural friendly materials with an attractive modern trendy design that created not only a multifunction piece, but a beautiful sculpture that adds a special effect at each area, materials used for Fig 2-a: recyclable plastic- transparent, recyclable wood, and recyclable metal materials used for fig 2-b: terrazzo, concrete, and recyclable plastic and recycle metal.

Figure 3: Students create their concept based on the research results, which seeks to improve the recycle bin, Identifying problems helps to find the best design, they focused on that the drinks is the most wasted and thrown in the recycle bin, and it causes a lot of problems for PSU staff, it reduces smells and it attracts animals, their design included the drink waste.
The following table describes all the projects submitted, and included the types, material used and their evaluations.

<table>
<thead>
<tr>
<th>No.</th>
<th>Design picture</th>
<th>Type: Outdoor design</th>
<th>Material used</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design 7</td>
<td><img src="image" alt="Design 7" /></td>
<td>Outdoor design</td>
<td>Recyclable plastic- transparent, recyclable wood, and recyclable metal</td>
<td>Creative, very good design, sustainable design</td>
</tr>
<tr>
<td>Design 6</td>
<td><img src="image" alt="Design 6" /></td>
<td>Outdoor design</td>
<td>Terrazzo, concrete, and recyclable plastic and recycle metal.</td>
<td>Creative, very good design, sustainable design</td>
</tr>
<tr>
<td>Design 5</td>
<td><img src="image" alt="Design 5" /></td>
<td>Outdoor design</td>
<td>Recyclable plastic- recyclable marble, and recyclable metal</td>
<td>Good design especially for drinks waste,</td>
</tr>
</tbody>
</table>
### CONCLUSION

This study explored the implementation of collaborative learning pedagogical approach to reach desired goals that are aligned with Prince Sultan University strategic plan and the National Transformational Plan. The project provided a platform for the participants to share creative ideas that reflect their respect to the environment and deeper understanding to concepts of sustainability.
The produced models are living example of the effectiveness of involving students in environmental projects. It can also be taken further to increase practices via create social interest in the families and the surrounding communities. The students designed pins that can be used by pedestrians in the walking areas around the university which in itself a proof of their proactive initiatives and collaborative creativity.

The study also proved that the following factors have positive effect on reaching the desired goals:

**Planning skills**, which includes detailed planning of all the process stages, task timelines as designed in the campaign

**Project management**: training students to use practical project management techniques and face the challenges that may appear while working in a practical project.

**Efficient Communication management process**: between the team work and supervisor (Environment Club) to communicate the right message at the right time in the project to achieve the goals.

**Effective financial management**: students were directed to use the budget wisely and how to reduce cost in their products.

Additional pedagogical techniques can be used in planning and implementation the future phases of the Go Green campaign based on the gains reached in the first two phases. With the general goal of enhancing the quality of life on campus for both students and faculty, numerous projects can be applied to change the organizational behavior. The shared interest that is created by this project is to be invested in strengthening the sense of mutual engagement and complementarity in future environment tasks.

**References:**

- Abdallah Al-Mouallimi, Saudi Arabia’s permanent representative to the UN, speaks during the sustainable development forum in New York. (SPA), ARAB NEWS- July 21, 201900:59, 104


- McLennan, J. F. (2004), The Philosophy of Sustainable Design

- Roben, Beaver, (2005), Mainstream Green sustainable Design By LPA, Australia

- Sara L. Beckman& Michael Barry (2007), ‘Innovation as a Learning Process’: Embedding Design Thinking, the Regents of the University of California


- http://www.epa.gov/greenbuilding/pubs/about.htm

Author Biographies

Hadeer Aboelnagah, is a Professor of English at the College of Humanities, at Prince Sultan University in Riyadh, Saudi Arabia. She is the Director of the university Translation and Authoring Center. Aboelnagah is a Principal fellow at the Higher Education Academy UK and an affiliated researcher and former faculty member at The University of Ottawa and Carleton University, Ottawa, Canada. Aboelnagah also taught at the State University of New York and Misr International University in Cairo. She was awarded Fulbright International Scholar award twice on 2006 and 2009. Her research interests cover a wide range of topics in the field of Humanities and student’s leadership. She authored a series of 9 English books introducing the culture of the Middle East and translated 7 books and has published numerous scholarly articles. Aboelnagah was a guest speaker at the World Forum of Humanities in South Korea 2018 and a speaker at “Food for Thought” TV series for diversity in Education in Netherlands during the summer of 2018. She is the advisor of the Environment Club at Prince Sultan University and the leader of Go Green Campaign I & II.

Walaa Metwally. is an Assistant Professor in Architectural Engineering program - College of Engineering in Prince Sultan University, she held her Ph.D. in Architecture from Faculty of Engineering, Cairo University, Egypt, Dr. Walaa is a Fellow of the UK Higher Education Academy. She has published many papers in Architecture, landscape design and teaching and learning field. Walaa has 19 years experience in academic teaching (16 years in PSU). She taught many courses in Architectural and interior design program. Walaa got the Outstanding Teaching Award - Prince Sultan University- College of Engineering 2018/19.