

STUDENTS EMPOWERMENT IN CAMPUS SUSTAINABILITY THROUGH ART INSTALLATION PROJECT

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ABSTRACT

Campus sustainability is a movement that requires a significant engagement from various campus stakeholders. Students as the biggest stakeholders have to play a meaningful role as the implementers, and academicians, on another side, must feel free to address campus sustainability issues and inspire the students to get involved in making the campus sustainability movement a reality. In 2013, Universiti Malaysia Sabah established an EcoCampus Management Centre to lead the sustainability movement to a higher level. The goal of the university is becoming an EcoCampus by 2018. Thus, in parallel with the goal of the movement, the Horticulture and Landscaping Programme (HG35), Faculty of Sustainable Agriculture (FSA), UMS has set out one of the Programme learning outcomes as to produce graduates who could grasp the concepts and principles of sustainable horticulture and landscaping. Several HG35 academicians and Key Persons appointed by the UMS authority had implemented the EcoCampus Core Values and Key Elements in teaching and learning activities. In this paper, the authors share their experience in integrating the sustainability movement in teaching and learning process for Garden Planning and Management course. A project-based learning (PBL) named EcoProject was structured to empower the students of the course to create something that could achieve the goal of the sustainability movement and most importantly is meaningful to them. The assessment is designed to allow the students (1) to integrate a variety of knowledge and skills pertaining to horticulture and landscaping in their projects, 2) to give a platform to the students to explore and adopt a sustainable initiative in FSA campus creatively, and 3) to foster a sense of belonging to the sustainability movement introduced by the University. The performance of the students was then evaluated using a Likert scale. At the end of the project, the students produced several distinctive art installations, for example, a lath house, that is, a shelter made of 1000 recycled 1.5L transparent plastic water bottles functioning as a plant nursery especially for acclimatizing young seedlings before field planting. The EcoProject assessment had demonstrated that sustainability movement could be harmoniously integrated into teaching and learning activities in higher education institutions. The project had inspired the students to be creative and confident to engage in a sustainability movement, and this experience is expected to stay with them once graduated.

Keywords: campus landscape; upcycling; student empowerment; arts; horticulture; project-based learning

1. INTRODUCTION

Commitment of UMS in Sustainability Movement

Universiti Malaysia Sabah (UMS) is the first university from Malaysia to join The International Sustainable Campus Network (ISCN) in 2013 (Universiti Malaysia Sabah, 2013). The network's aim and approach are to provide a supporting platform for leading colleges, universities, and corporate campuses to exchange information, ideas, and best practices for achieving sustainable campus operations and integrating sustainability in research and teaching (ISCN, 2017).

Inspired by the exchange of ideas and best practices from the network, the UMS has planned to become a Green University by 2018 (Lajiun, 2014). To turn the idea of becoming a green campus by the year 2018 into reality, UMS established EcoCampus Management Centre (EMC) to lead the green university aspiration and achieve the 'EcoCampus' brand. The EMC has then later initiated and actively implemented the campus sustainability movement on the three UMS campuses each in Kota Kinabalu (main campus), Sandakan and Labuan.

There are several ways taken by EMC to fulfil the sustainability movement including to reduce an on-campus carbon footprint and to increase environmental awareness among the students, staff and local communities around the three campuses (Abdullah & How, 2017). The EMC has also introduced the use of Key Person at every faculty in UMS to coordinate the EcoCampus initiatives in each faculty (Hussin & Kunjuraman, 2015). EcoCampus aim to promote (a) environmental education, care and sustainability through proper planning, (b) operational and management practices that will affect the curriculum, teaching and research, and (c) sustainability campus experience through the leadership of the University (Abdullah & How, 2017).

At the Faculty of Sustainable Agriculture, Sandakan, one of the UMS Campuses, the movement initiated by the EMC has been implemented by the academicians with the help of the students specifically in the Horticulture and Landscaping Programme (HG35). Briefly, the programme has the mission to produce alumni and alumnae who are innovative, knowledgeable, skilful, objective, virtuous, and persistent in addressing horticulture and landscaping issues to meet the national and global needs (Faculty of Sustainable Agriculture 2016). One of the eight learning outcomes outlines the students' ability to demonstrate an understanding of the concepts and principles in sustainable horticulture and landscaping discipline. The lecturers in the programme are aware that, the students need to be empowered to carry out a project associated with sustainability to achieve the learning outcomes. Hence, the present paper reports the experience of the lecturers and the students in sustainable movement project embedded in teaching and learning of one of the courses (Garden Planning and Management) in HG35. The project, named EcoProject, had involved art installations at several sites on the campus as a stimulator for sustainable movement awareness. The contribution of the faculty was well recognised by UMS and received a warm acknowledgement from the university during the UI-Greenmetric presentation in Indonesia (Abdullah & How, 2017).

2. LITERATURE REVIEW

2.1 Integration of Sustainability in Higher Education Curriculum

Sustainability has become the central issue in UN Sustainable Development Goals, and universities worldwide have taken several actions to respond to the challenge through various measures including campus greening and sustainability education initiatives. Aktas et al. (2015) suggested that the focus should be concentrated on education for and through sustainability rather than education about sustainability.

Universiti Malaysia Sabah aims to become an EcoCampus by 2018; one of the methods is to integrate sustainability into university curricula. The top administrators may initiate sustainability, but the proponents of the sustainability efforts are the small units running at each faculty (Thompson & Green, 2005). They are the change agents who promote sustainability in teaching and learning, research, operation and management as well as community service. This active sustainability unit will ensure that the continuous efforts of sustainable landscape initiatives in the faculty will become successful in a long term; an undeniable evidence of the vitality of bottom-up approach besides top-down approach (Thompson & Green, 2005).

2.2 Students Empowerment

Empowerment of students requires empowered teachers (Cowdery, 2011). Empowered teachers increase their ability to effect change for students. Therefore, the willingness of the lecturers to share their power in facilitating students to take partial control of their education can be a daunting prospect for them. However, as outlined by MindMatters (2014), the five key elements to frame student empowerment are (1) commitment, (2) knowledge and skills, (3) confidence, (4) opportunities and responsibilities and (5) active support helps teachers and lecturers to managed student empowerment activities.

2.3 Project Based Learning and Education for Sustainability

Project-based learning (PBL) is a model that organises learning around projects; the project is the central teaching strategy (Thomas, 2000). Students discover the concepts and essence of the subject through the project. He later added that PBL projects be focussed on questions or problems which "drive" or direct students to encounter (and struggle with) the central concepts and principles of a discipline. PBL is mostly student-driven and not lecturer-led and requires students to be involved in a constructive investigation to seek solutions for a particular type of problems (Wiek et al., 2014).

PBL assessment is unique as it requires intersection of topics from two or more disciplines. It is where land art or also widely known as earth art is integrated into the assessment. Land art is installed directly in the landscape thus the name art installation (Tate, 2017). It can be the act of moulding the land itself into earthworks or by making structures in the landscape using various natural materials such as rocks, sand or twigs. Environmental art with its main concerns is social and political issues relating to the natural and urban environment (Tate, 2017). Arts are important to be exposed to the students to widen their understanding with sustainability movement. Merging landscape, horticulture and arts are vital for PBL, as the central activities must involve the transformation and

construction of knowledge (by definition: new understandings, new skills) on the part of students as argued by Bereiter & Scardamalia, 1999 as cited in (Thomas, 2000).

Wals & Jickling (2002) suggest that the concept of sustainability education needs to be challenged, negotiated and discussed because eventually, sustainability rests on various interests and values. They supported the second approach to Education for Sustainability; it must be participatory, open and respectful of different perspectives and attitudes. It must provide a means for the students to become self-actualised members of society, looking for meaning, developing their potential and jointly creating solutions because to create the world that is more just, peaceful and sustainable. All individuals and societies must be equipped and empowered by knowledge, skills and values as well as be instilled with a heightened awareness to drive such change (UNESCO, 2014). Education for Sustainable Development (ESD) a roadmap introduced by the UNESCO is about shaping a better tomorrow for everyone and urge for the change to start today.

As a student-led project, the lecturer does not prescribe any particular outcome or path to the students; they have the autonomy and freedom to discuss and choose (Thomas, 2000). However, it is important for the students to be aware that the EcoProject must first try to address authentic sustainability problems within Malaysia. The students' proposed solutions must possess some degree of potential to be implemented or replicated later by the Malaysian's community.

3. METHODOLOGY

3.1 Project-Based Learning- Aims and Objectives

Garden Planning and Management is a Horticulture and Landscaping Programme required courses which had been selected to integrate the sustainability movement in teaching and learning. The second learning outcome of the course highlights that "the students can demonstrate the ability to design and implement sustainable landscape initiatives through land or environmental art installation project". An Ecological Land Art Installation Project (EcoProject) has been introduced with a goal to solve real-life sustainability challenges in the actual setting. The course module requires the students to have a higher sense of responsibility than the traditional teaching and learning activities which is hoped to heighten the sense of belonging to the assessment.

3.2 Implementation of the EcoProject

EcoProject involved 28 students divided into six groups (4 to 5 students per group). The facilitator of the EcoProject was a lecturer of the Garden Planning and Management course. The lecturer worked closely with the students (instead of telling them on what to do) to inspire them to perceive sustainability movement internally and to spread this movement creatively in the campus through an art installation.

(a) Student Empowerment in the Campus Sustainability Movement

The first step in the project was organising several group brainstorming sessions. The students were given the freedom to choose the members of their groups. They then did a

brainstorming in their groups without the influence of the lecturers. The brainstorming process was repeated to collect and collate opinions on different issues and challenges until a decision had been made on the way forward for their EcoProjects.

They were also allowed to organise a survey session independently around the campus to find a potential site where their arts could be installed. After that, they discussed the way the installation of their arts was carried out. During the discussions, the students were encouraged to maintain a high control of communication, teamwork and leadership to avoid from deep conflicts. They were also, however, invited to express their opinions and concern whenever possible to help them in creating artistic yet impactful ideas for their projects and the sustainability movement on the campus. They were allowed to use different social media platforms and the websites to discover what other artistic people are doing with wastes. This session was intended to inspire the students to create something artistic based on their preference. They were also given freedom to direct the EcoProject artistic expression to anything they prefer but with one particular limitation that was not to violate sensitivity of race, religion and humankind.

(b) Arts Installation and Campus Sustainability Movement

The second step was the students implemented the most suitable art they had selected during their first step (stated just above). They did this based on their experience in Landscape Construction Course. The presentation of the project was made public to create an opportunity for the students to share their EcoProject and to explain the meaning of their arts from the perspective of sustainability. The public presentation was also intended to let them realised that they were making marked contributions to the sustainability movement in the campus. In that way, they will develop their projects with confidence and sense of belonging to that movement.

(c) EcoProject Assessment

The students were briefed before the project commencement on how their arts or EcoProjects will be marked. Likert scales ranged from 1 to 5 were used to rank the quality of their arts. They were also required to present their arts openly where every other student in the faculty (or from other groups) was invited to participate to instil a sense of pride and belonging (in the students who were presenting their arts) to their arts or EcoProjects. The open session evaluation was also aimed to motivate the students to work harder and set a meaning for their projects (Appendix 1).

Table 1: Criteria used to evaluate the EcoProject learning objectives

| | EcoProject learning objectives | Criteria |
|---|---|--|
| 1 | To integrate a variety of knowledge and skills about horticulture and landscaping | Evidence and sufficiency of integration of other knowledge to the EcoProject |
| 2 | To give a platform to the students to creatively exploring and adopting sustainable initiatives in the FSA campus | Originality, adoptability, confidence |
| 3 | To foster a sense of belonging to the sustainability movement introduced by the University | Teamwork, commitment, leadership, opportunities and responsibilities |

4. RESULT AND DISCUSSION

4.1 Student Empowerment in the Campus Sustainability Movement

It is interesting to note that during the brainstorming sessions there was a noticeable evolution of response and feedbacks between the group members from less confident to more confident to finish their projects at their initiative, or in other words, they were empowered. Initially, they simply met and distributed the responsibilities to search the web and borrow books from the library. After that there were not many communication and discussion between them; they did only their roles. Over time, however, everyone was willing to contribute ideas and concerned regarding the progress and performance of their projects. This development led them to decide on what they want to install or build. They then arranged a time to discuss their projects with their lecturers especially to seek an advice and approval for their EcoProject, whether it will work under a limited fund and construction materials. During the consultations with their lecturers, the students appeared to be more confident to change the way sustainability is perceived and implemented in the campus, to capitalise their experience and knowledge prior to the EcoProject to make their projects stood out on the campus, and to make their EcoProject as something 'artsy', fun and unconventional. The traits shown by the students are well within of the report from UNESCO. The Education for Sustainable Development, UNESCO has reported that a collective support is important to achieve sustainable development and to provide a link between the local and the global community is essential to create multi-stakeholder learning and community engagement (UNESCO, 2017). Without the support from the local community, a full mobilisation of education and learning for sustainable development would not be achieved.

4.2 Arts Installation and Campus Sustainability Movement

The students used the Internet to learn about art installation projects portraying sustainable practices around the world. With those examples, the students were able to demonstrate a proposal with a diverse range of creativity from a lath house to a living wall. Some of the projects demonstrated a high degree of horticulture and landscaping knowledge integration, for example, the rain garden model (See Table 5, Group 1).

4.3 EcoProject Outcomes

For the EcoProject, each student group submitted a proposal and a report and presented their arts. The groups that managed to capitalise on their knowledge and skills from other courses especially Landscape Design, Landscape Horticulture, Landscape Construction, and Plant Propagation and Nursery Management, and received a higher mark were (1) rain garden model, (2) lath house and (3) living wall. These groups also finished their EcoProjects at the quality stated in their proposals. The marks for each group were as follows:

Table 2: Performance of the students.

| Student group | 1 | 2 | 3 | 4 | 5 | 6 |
|----------------------|----------|----------|----------|----------|----------|----------|
| Marks (out of 10%) | 9 | 9 | 9 | 8 | 7 | 7 |

All groups incorporated solutions for a real-life environmental concern in Malaysia, with the focus to solve the actual problems in FSA campus. Probably, the most notable innovation of the students was the Rain Garden Model; in this project, the group wanted to demonstrate how to decrease agricultural/ surface runoff in the campus. Second to the Rain Garden Model was the Living Wall, as it tries to solve the hot environmental issue commonly complained by the campus community. After the Living Wall was the Lath House, a shelter made from recycled plastic bottles, and the Recycled Wooden Bench, a bench made from reclaimed wood. To promote a cycling culture on the campus, one group (Group 6) created a focal point from an abandoned bicycle and planted resilient plants around it; they built this from the idea that cycling can reduce transportation cost and carbon footprints.

(1) To integrate a variety of knowledge and skills about horticulture and landscaping

As the EcoProject needed to be interdisciplinary for the group to be given a good mark, the students had integrated a wide range of skills and knowledge in horticulture and landscaping in their projects (Table 3). This means that the EcoProject had inspired them to be creative and innovative in expressing a sustainable movement.

Table 3: Variety of knowledge and skills of students enrolled in the EcoProject

| Group | Variety of knowledge and skills | Ratings |
|--------------|---|----------------|
| 1 | They add biochar to the rain garden soil layering. The shrubs were chosen from the resilient type; less maintenance and have coloured foliage to increase the aesthetic value of a wall. The resilient plants are the best for the Sandakan campus microclimate | 4/5 |
| 2 | Lath house concept was discovered during Plant Propagation and Nursery class. The carpentry skill was gained from Landscape Construction class. The simplicity of the design is from Landscape Design class. | 4/5 |
| 3 | The shrubs were chosen from the resilient type; less maintenance and have coloured foliage to increase the aesthetic value of a wall. Living wall is a great place to showcase the resiliency of plants. | 4/5 |
| 4 | This group used knowledge and skill from Landscape Design and Landscape Construction class to produce the feature wall displays. | 2/5 |
| 5 | Landscape Design and Landscape Construction, Landscape Horticulture, Plant Propagation and Nursery subject had been applied in the project. The plant's selection is based on resilient plants species. | 2/5 |
| 6 | Knowledge of Landscape Design, Landscape Horticulture and Landscape Construction classes had been applied to this landscape furniture project. | 3/5 |

(2) To give a platform to the students to explore and adopt creatively sustainable initiatives in FSA campus

The creativity of the students was put on a test when the lecturer did not specify what form of output was targeted in the project. The marking rubric guided the students only on how to develop and produce a so called creative art. As a result, the students took a much longer time to decide a kind of art to be installed. On the other hand, this approach of teaching had helped them to empower themselves in managing their EcoProject. At the end they

managed to come out with several different formats of the report with unique objectives, justification and findings (Table 4); all they discovered during the difficult period of the project, that was, during no guidance.

Table 4: Variation in project objectives, justification and other findings reported by the students



| Group | Objectives (and rating) | Justification | Other findings |
|-------|---|--|---|
| 1 | To decrease rainwater runoff from polluting water catchment in UMS Sandakan Campus. (4/5) | <ul style="list-style-type: none"> • One of the solutions to alleviate degraded soil problem in the campus. • Building a model to demonstrate the rain garden mechanism in treating rainwater helps people understand better. | <ul style="list-style-type: none"> • To filter 1.5 L of water; the model requires < 20 minutes. • A step before recommending to the Faculty to construct a real rain garden within the faculty compound |
| 2 | To build a lath house (a structure used to raise seedlings, cuttings and young rhododendron plants to get them adjusted to the weather). (5/5) | Using plastic bottles waste to construct lath houses that protect the plants from hot and drying winds, reduce the intensity of the sunlight, lower temperatures and maintain high humidity | <ul style="list-style-type: none"> • Plastic bottles were collected in FSA and around Sandakan. • To inspire a unique way to reduce waste plastic bottles to the FSA community. |
| 3 | To alleviate the thermal discomfort by building a living wall. (3/5) | Living wall is capable of reducing the energy needed to cool the interior of the building if it is done on a bigger scale. | <ul style="list-style-type: none"> • The plants used for the project are resilient plants for FSA's harsh microclimate. • Although small in size, the project is hoped to demonstrate to the FSA community how to build and care for a small scale living wall. |
| 4 | To create artistic feature wall displays made of recycled materials. (3/5) | <ul style="list-style-type: none"> • Bottle caps and writing tools were chosen as they are among the hardest to recycle • The group collected pencils and pens that were no longer used by the FSA community | <ul style="list-style-type: none"> • They demonstrated ways that had never been attempted in FSA to upcycle the writing materials, bottle caps and paper materials. • The group also realised that to create a better environment, everyone's contribution is vital as all the wall display materials were collected from the FSA community |
| 5 | To promote cycling culture in FSA using an old abandoned bicycle. (3/5) | <ul style="list-style-type: none"> • The faculty has a great road facility and cycling around the campus, but not many are willing to cycle. • The bicycle sculpture is to remind people about cycling option to move around campus. | There are abandoned and damaged bicycle left by seniors. Thus, they decided to recycle the bicycle and used it as the main foci in the campus. In a way, bicycles can become a trademark in the campus as more students |

| | | | |
|---|---|---|---|
| | | | and staff are familiar with cycling concept instead of using motorised vehicles. |
| 6 | To demonstrate to FSA community how to utilise the abundance of the wooden palette in the faculty by upcycling the material. (4/5) | <ul style="list-style-type: none"> • The faculty has abundant of the wooden palette. Therefore, they decided to make palette bench. • This type of bench can be a cheaper solution to address lack of seating area throughout the campus. | <ul style="list-style-type: none"> • Four to five wooden palette is required to build a bench of this size. • This reclaimed wood can be used to make other fittings and furniture such as; floors, tables, cabinets etc. |

(3) To foster a sense of belonging to the sustainability movement introduced by the University

The students were required to install and present their arts at the public spaces to enhance the sense of responsibility and commitment to their EcoProjects (Table 5.1) especially on the connection between their arts and sustainability. This way of presentation indirectly means the students contributed to sustainability awareness. Although this kind of presentation was not fully welcomed (by the students) initially, in the end, once the project was completed, they were proud with their EcoProjects and showed an unconditional happiness (Table 5).

Table 5: Photos of completed EcoProjects by the students

| Group | Picture 1 | Picture 2 |
|----------|---|--|
| 1 |  |  |

2



3



4



5





Explanation for the pictures: Group 1 [Picture 1 (A completed rain garden model section that allows others appreciate the intricate layering of the improvement needed to alter UMS Sandakan Campus degraded soil.); Picture 2 (The students also prepared brochures for everyone who wishes to learn more about the model. They were extremely happy with the outcome of the project.)]. Group 2 [Picture 1 (The result of a lath house next to the plant nursery on the campus.); Picture 2 (The all ladies group posed with their lath house that they worked really hard for)] Group 3 [Picture 1 (A completed living wall before attached to the wall. The resilient type of plants thrives even when planted vertically.); Picture 2 (The group members were happy with the outcome of the project after being extremely diligent propagating the plants and establishing it on the structure.)] Group 4 [Picture 1 (The result, now is displayed at FSA's rooftop garden and Landscape studio and one of it is featured in the HG35 website.); Picture 2 (The students on their presentation day, proudly sharing their artwork and information on waste management with the audience.)] Group 5 [Picture 1 (The result; bicycle-theme foci next to the hostel.); Picture 2 (The group posed with their garden foci. Unfortunately, the group did not manage to complete some of the elements as they proposed earlier.)] Group 6 [Picture 1 (the upcycled wooden palette, now displayed at FSA Foyer.) Picture 2 (The group found that it takes real skill and patience to dismantle palette which caused the group failed to build a wider bench and a table as planned.)]

5. CONCLUSION AND RECOMMENDATION

The present paper demonstrates that sustainability movement is possible to be integrated harmoniously into the teaching and learning activity in a higher learning institution, for example, in this case, UMS. This can be achieved by empowering the students to install environmentally motivated arts. The EcoProject, for example, had finally motivated the students to engage actively in brainstorming and decision-making process to create awareness on sustainable campus. There were a few challenges in the project, however, such as, the students had limited fund and materials to install their arts; on the other hand, this situation helped them to learn to be responsible for their decision especially to find an affordable approach to achieve the objectives of their arts. The project was also a good platform for the students to tap their creativity and to enhance their soft skills. It is thus recommended that more EcoProjects, such as art installation be carried out in UMS and other universities, following the approach used in our study, to achieve the goal of sustainable movement and the "EcoCampus" brand.

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Appendix 1: Students demonstrating their responsibility and commitment in completing their EcoProject

| | | |
|---|--|--|
| 1 |  |  |
| | The students were setting up a perforated PVC pipe to the foundation of the rain garden soil | The students were installing resilient plants to the rain garden model |
| 2 |  |  |
| | The students were building the basic frames of the lath house | They were attaching the plastic bottles on the frames. |

| | | |
|-----------------|--|---|
| <p>3</p> |  |  |
| | <p>The students were working together to build the structure of the living wall.</p> | <p>One of the students was planting ornamental plants on the living wall structure.</p> |
| <p>4</p> |  |  |
| | <p>A painting work made by all members.</p> | <p>The students applied carpentry skill gained from Landscape Construction Course in their Living Wall project.</p> |
| <p>5</p> |  |  |
| | <p>One of the students was cutting a plank for the recycled wooden bench.</p> | <p>All of them contributed in dismantling a pallet for their bench.</p> |
| <p>6</p> |  |  |
| | <p>The students were marking the boundary for the bicycle (focal point).</p> | <p>They were planting ornamental plants around the bicycle.</p> |