

## Internet Appendix A47: Education for Sustainability

### A47.1 Illustrative Pitch Template Example

| Pitcher's Name              | Siti Nur Diyana Mahmud                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FoR category | Education | Date Completed | 26 July 2015 |
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| (A) Working Title           | Systems Thinking Approach to Education for Sustainability: A Case Study of University Kebangsaan Malaysia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |           |                |              |
| (B) Basic Research Question | How might a whole systems thinking view assist understanding of Education for Sustainability at Malaysia university?<br>Systems thinking is the process of understanding how those things which may be regarded as systems influence one another within a complete entity, or larger system. In an organization like UKM, systems consist of people, structures, and processes that work together to make an organization "healthy" or "unhealthy".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              |           |                |              |
| (C) Key paper(s)            | Espinosa, A., & Walker, J. (2011). <i>A complexity approach to sustainability</i> . London, UK: Imperial College Press.<br>Jickling, B., & Wals, A. E. J. (2012). Debating education for sustainable development 20 Years after Rio: A conversation between Bob Jickling and Arjen Wals. <i>Journal of Education for Sustainable Development</i> , 6(1), 49–57. doi:10.1177/097340821100600111<br>Jones, P., Selby, D. and Sterling, S. (2010) <i>More than the sum of their parts? Interdisciplinarity and sustainability</i> , in Sterling, S, Jones, P and Selby, D (2010) <i>Sustainability Education: perspectives and practice across higher education</i> , Earthscan, London.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |           |                |              |
| (D) Motivation/Puzzle       | Sustainability is a complex and contested paradigm and open to many interpretations. To date, the development of the concepts related to sustainability and the range of terms used has led to differences in understanding in educational circles. In higher education institutions there is documented confusion about the terms sustainable development and this confusion resulted in a lack of consistency in the use of the terms. Lecturers struggle to understand the conceptual range of the term sustainability, and usually they focus first on environmental dimensions and miss the integration of social and economic aspects. Resulted in many sustainability initiatives but most of it is a weak sustainability learning. Despite two decades of good intentions in Malaysia, no coherent "sustainability curriculum" appears to exist and most of the HEI sustainability initiatives are 'bolted-on' without any real curriculum reform or integration. Hence there is a need for practical tools in enacting Education for Sustainability (EfS). Accordingly, this study will address the worldview of sustainability, the system structure supporting EfS in UKM and the pedagogical approaches for EfS in higher education.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |           |                |              |
| THREE                       | Three core aspects of any empirical research project i.e. the "IDioTs" guide                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              |           |                |              |
| (E) Idea?                   | To understand the complexity and all-encompassing nature of sustainability, I look to frame the study using a system thinking approach. A system is more than a sum of its parts, it is an interconnected set of elements that is organised in a way to achieve desirable goal. At its core, systems thinking is about addressing the root cause of problems and provides a different way of seeing and thinking about the world's economic, organisational, and societal problems. It allows one to see the interconnections of a problem and to be creative with systems. I choose the Viable System Model (VSM) (Beer, 1984) as theoretical foundation because it focuses more on how a system functions. The VSM involves drawing together potential organisational developments to form new higher order plans. I can reflect on UKM viability by mapping them as viable systems nested at different levels, and by reflecting on any structural factors that may constrain viability. By using the distinctions provided by the VSM, I can first map the structural elements of the organisation (UKM) that related to sustainability, and then assess the system's viability in terms of how it manages the variety of its interactions with its changing environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |           |                |              |
| (F) Data?                   | <p><b>Setting:</b> Universiti Kebangsaan Malaysia</p> <p><b>Data sources:</b> Semi-structured interviews with lecturers, focus-group interviews with students, observations during sustainability related classes, sustainability related course learning outlines, Malaysia Education Blueprint 2015-2025, UKM Sustainability Master Plan and UKM 2000-2020 Strategic Plan.</p> <p><b>Trustworthiness of the data:</b></p> <ul style="list-style-type: none"> <li>- Triangulation of the data using multiple sources of data: I will compare and cross-check the consistency of information derived from the document analysis and observations with the semi-structured interviews and focus group interviews</li> <li>- Member checking: the participants will check their own interview transcript to ensure the accuracy,</li> <li>- Audit trail: thorough collection of documentation regarding all aspects of the research. Qualitative inquiry typically involves a design that constantly changes or emerges through the iterative processes of data collection and analysis and requires that the researcher makes frequent decisions that can alter the course of the study. As a result, records of study processes can be vital in later providing justification of these actions. The audit trail provides a mechanism for retroactive assessment of the conduct of the inquiry and a means to address issues related to the rigor of the research.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                             |              |           |                |              |
| (G) Tools?                  | <p><b>Research design:</b> Single holistic case study design. UKM is the case, because this study will focus on system dynamics in an institution and cybernetics in its organization.</p> <p><b>Semi-structured interview with lecturers:</b> The questions will focus on conceptualisation and perception toward sustainability, system structure that drive or restrict enactment of EfS in UKM and what kind of pedagogical approaches the lecturers perceive provide better opportunities to learn sustainability.</p> <p><b>Focus group interviews with students:</b> The focus group interviews will include pre-activities before a focus group interview to allow participants to gain familiarity and trust. The questions will focus on conceptualisation and perception toward sustainability, system structure that drive or restrict enactment of EfS in UKM and what kind of pedagogical approaches the students perceive provide better opportunities to learn sustainability.</p> <p><b>Observations:</b> structured - employing an observation schedule that consists of forms prepared prior to the data collection, outlining the behaviour and situational features to be observed and recorded. The observation form: is based on a matrix regarding transformative learning (Sipos et al. (2008)) and will include several criteria eg, during the lesson: content covered, types of activities implemented, role of the lecturer, role of the student and lecturer-students interaction.</p> <p><b>Document analyses:</b> Malaysia Education Blueprint 2015-2025, UKM Sustainability Master Plan and UKM 2000-2020 Strategic Plan provided background information/historical insight - understanding the historical roots of sustainability initiative in UKM and indicate the conditions that impact the studied phenomena.</p> |              |           |                |              |

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|                                 | <p><b>Field notes:</b> descriptive recording of observations and reflexive process of interpretation.</p> <p><b>Data analysis:</b> i) familiarizing with the data, ii) generating initial codes and assigning codes (using Computer Assisted Qualitative Data Analysis Software, Atlas.ti), iii) mapping out data pattern(s), iv) theme identification, vi) interpretation of themes.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>TWO</b>                      | <b>Two</b> key questions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>(H) What's New?</b>          | Recent relevant EfS research focuses on different <b>separate</b> elements but <b>ignores</b> systematically <b>combining</b> all elements to create the <b>whole "picture"</b> of EfS in higher education. This study will focus on the <b>dynamics</b> through which the gestalt and its units interact instead of focusing on a specific role, structure or unit. UKM will be conceptualised as <b>dynamic</b> systems which are in continuous interaction with UKM's <b>external environment</b> (i.e., socio-cultural, religious influence, Malaysia national agenda, globalisation and current sustainability crisis) and <b>with its units</b> (i.e., campus operation, curriculum and pedagogy, research activity and management). The <b>homeostasis</b> concept (analogous to human body natural mechanism of maintaining a constant internal environment in response to environment changes), will be applied in analysing the enactment of EfS in UKM. How UKM maintains/sustains its' roles as higher education institution and its' mission to <b>lead</b> the development of a learned, dynamic and moral society during the age of sustainability crisis pressure. How UKM responds to this <b>sustainability pressure</b> and what kind of <b>feedback mechanism</b> implemented. |
| <b>(I) So What?</b>             | By revisiting the work of Stafford Beer in <b>organisational cybernetics</b> , indicate to relevant researchers and practitioners, <b>how</b> such a synthesis will <b>benefit</b> in the understanding and re-design of <b>social structures</b> and <b>institutions</b> , in forms that are better prepared to foster sustainability.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>ONE</b>                      | <b>One</b> bottom line                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>(J) Contribution?</b>        | Provide insight into the connection between globalisation effect to EfS enactment and localising the approach with local context. The finding will inform the understanding on how university respond to change & manage its' interaction to change. Provide insight into learning and teaching required for transformative sustainability learning. Provide insight into the dissonances of sustainability worldview held by the stakeholders in university                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>(K) Other Considerations</b> | <p><b>Target journal:</b> International Journal of Sustainability in Higher Education, Journal of Education for Sustainable Development and Qualitative Research Journal.</p> <p><b>Ethical clearance:</b> UQ Ethics Committee, Malaysia Economic Planning Unit and Universiti Kebangsaan Malaysia.</p> <p><b>Ethical considerations:</b> i) participant access, ii) insider status, iii) language, iv) power disparity and v) participant protection.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |