



Title	Towards weak sustainability in the formal curricula: a case study of research-driven pedagogical reform in Hong Kong
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Journal of Economic Dynamics and Control, Journal of Regulatory Economics, Land Economics, International Journal of Production Economics, Omega, Environmental and Resource Economics, Resource and Energy Economics, Energy Economics, Environment and Development Economics, Ecological Economics, Economic Modelling, Agricultural Economics, Journal of Industrial Ecology, Energy Policy, and Physica A. He has also written general-interest columns for newspaper such as *The Guardian* and his study is also featured in life sciences journal such as *Science*. IDEAS/RePEc ranks him among the top 40 young economists in the world and top in Japan and top in environmental economist (10 years or less) as of August 2012.

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*Towards weak sustainability in the formal curricula: a case study of
research-driven pedagogical reform in Hong Kong*

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International organizations such as UNESCO have long recognized the important role of education in helping to achieve the goals of sustainability/sustainable development. The launch of the Decade of Education of Sustainable Development (2005-2014) is a strong indication of UNESCO's commitment to promoting the Education for Sustainable Development. Curiously "Education for Sustainability" has been used interchangeably with "Education for Sustainable Development" by many organizations, even though there are subtle but significant differences between the two phrases. The teaching and learning of both concepts involve capacity-building and life-style changes and, as such, they are different from the conventional type of environmental education that concentrates on problem-solving skills.

Linking research with pedagogy in regard to sustainability has always been a challenge for the wider community of researchers working on sustainability-related topics because this concept, itself a percept of the popular concept of Sustainable Development, has been a subject of intensive debate on what constitutes progress toward achieving the larger goals of the latter. This debate centers on the question of whether a strong sustainability criterion or a weak sustainability criterion should be observed in assessing development policies and projects. The key point of contention between these two competing paradigms pertains to the issue of whether, and to what extent, manufactured capital could substitute for natural capital that is being rapidly depleted for development purposes. Proponents of the weak sustainability paradigm argue that, through technological advancements, manufactured capital could fully substitute for any diminishing natural capital and, therefore, the overall combined stock of manufactured capital and natural capital will remain constant over time, consequently ensuring intergenerational equity. Opponents skeptical of this worldview contend that humankind should subscribe to a strong sustainability criterion, which regards manufactured capital to be complements to, not substitutes for, natural capital.

The case described in our paper illustrates how research has informed curriculum development on the issue of sustainability for Technical, Vocational Education and Training (TVET) in Hong Kong. It focused on the question of how, and to what extent, a major provider of TVET has responded to prospective employers' expectations on sustainability skills of their future employees. Generated by a combined methodology of semi-structured interviews and social network analysis, the study's preliminary findings showed that there was a gap between the objectives of the curriculum of the major provider of TVET and the expectations of prospective employers. In response to this identified gap, the provider has revamped its curriculum to make sure that a certain proportion of the curriculum of each of its programmes contains sustainability elements.

The study's findings also showed that prospective employers assigned a preference for a weak sustainability stance in regard to the overall orientation of TVET curriculum reform. Instead of "greening" the city's economy—which would demand a transformation of corporate and personal practices as well as the rules of the game, employers are primarily interested in building a "green economy" as a new driver to further the city's growth. As a consequence, the green skills being emphasized pertain to the latter, not the former. These include environmental finance and emissions trading, as well as sustainability management and energy efficiency.

This case study demonstrates that research can inform the direction of pedagogical reform in the educational sector. It is a concrete example of the power of research in shaping curriculum structure and pedagogical approaches to teaching sustainability. With public concern increasingly focusing on climate protection and the perceived policy need to build a green economy, the task of researching and critiquing what sustainability perspectives should be adopted to guide the reform of curricula in Hong Kong has become an increasingly pertinent issue.

Dr Tsang is an environmental scientist by training, specializing in feasibility studies and environmental impact assessment studies. In recent years, he has been funded by external bodies such as the HKSAR as well as the National Science Foundation (China) to conduct research projects in areas of environmental conservation and policy studies. He also specializes in education for sustainability research particularly on the evaluation of environmental programmes. Dr Tsang was appointed visiting professor by a number of universities and was a visiting scholar in University of Minnesota in 2001 and 2003. He is also active in the local and international community, having been appointed as chairman and member of government committees, the chairman of Green Power, a major green group and members of funding bodies such as the Environment and Conservation Fund. Dr Tsang now serves in the Advisory Council on the Environment which advises the HKSAR on important matters relating to environmental protection. Internationally, he is a panel member of the International Year of Global Understanding launched by the International Geographical Union (IGU). In 2012, he was also appointed to be Associate Director of the UNESCO UNEVOC centre (HK, China) to promote green skills in research.

Dr. Frederick Y.S. Lee is an Associate Professor in the Department of Geography at the University of Hong Kong. Dr. Lee earned his PhD degree in Urban Planning from the Massachusetts Institute of Technology. His current research projects include regional environmental governance and cultural heritage management. On the former topic, he is examining the institutional constraints hindering cross-boundary cooperation, between Hong Kong and its neighbouring jurisdictions, in managing region-wide environmental externalities in the Pearl River Delta region. On the latter, he is studying the problem of conserving urban cultural heritage assets in China's transitional economy, examining this issue through in-depth case studies of Shanghai and Guangzhou. He has published his research papers in international journals such as *The China Quarterly*, *Journal of Contemporary China*, *World Development*, *Environmental Politics*, *Third World Planning Review*, *International Development Planning Review*, and *International Journal of River Basin Management*. He has co-edited *Asia's Environmental Movements: Comparative Perspectives* (M.E. Sharpe) and *Cultural Heritage Management in China: Preserving the Cities of the Pearl River Delta* (Routledge).