

# GREAT IDEA

## Graduate Research and Education for Appropriate Technology: Inspiring Direct Engagement and Agency

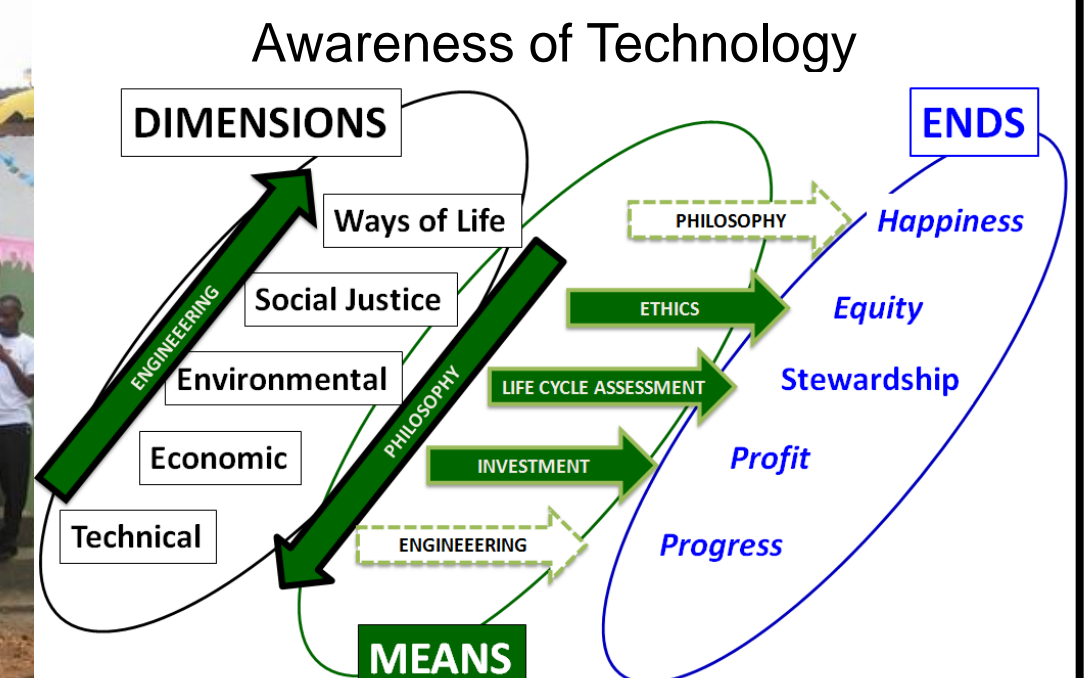
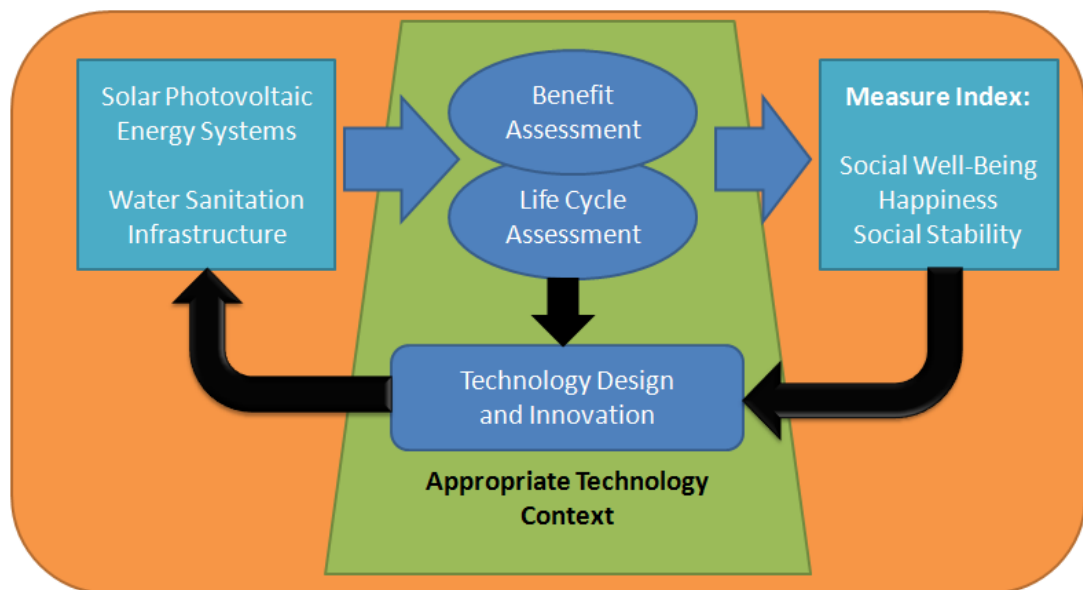


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### Appropriate Technology Context



## Summary

Despite a long volunteer tradition of engineers and scientists developing **appropriate technology (AT)** to serve humanitarian causes, relatively few appear to orient their primary academic and professional activities to such work (Papadopoulos & Hable, 2009). GREAT IDEA will build off of prior efforts in humanitarian engineering (HE) to explore attitudes related to AT among engineering graduate students and faculty, and to inspire and/or train them to pursue research and careers in AT. Projects will focus on the Caribbean region.

## Research Component

GREAT IDEA will develop and disseminate a **survey** to investigate attitudes of engineering graduate students and faculty regarding perceptions of the **purpose** and **social context** of engineering. The survey will build off of prior research (Leydens et al., 2009) and will probe ideas and issues such as:

- Definitions & characteristics of engineering & technology
- Perceptions of who is positively or negatively impacted by engineering and technology
- Perceptions of AT, including barriers and opportunities to applying engineering research toward AT & HE

The survey will consist of a general part, completed anonymously, and voluntary follow-on interviews. It will be disseminated online and will target universities in the US, Puerto Rico, and Spain.

## Educational Component

GREAT IDEA will educate and train graduate students through new courses, seminars, and direct support for graduate research. New courses proposed are:

- **INTD 5091 Appropriate Technology.** Overview, history and case studies in AT. Participatory Action Research component.
- **INTD 5092 RCR in the Context of AT for Community and Social Development.** General principles of RCR. Student-developed case studies to survey and assess community development projects.

Approximately 3-4 graduate students will be supported for thesis work in AT-related projects. General seminars will be delivered during graduate student orientation. Courses and seminars will count toward federal compliance for RCR.

## Selected References

- Castro-Sitiriche, M.J., C. Papadopoulos and H.J. Huyke, "Interdisciplinary Work in Philosophy of Technology", in *Philosophy and Engineering: Reflections on Practice, Principles and Process*, D. Goldberg, D. Michelfelder, and N. McCarthy (Eds.), to appear.
- Leydens, J.A. and J.C. Lucena. "Knowledge Valuation in Humanitarian Engineering Education", in *Engineering in Context*, S.H. Christensen, B. Delahousse, and M. Meganack (Eds.), Academica, Copenhagen, 2009.
- Papadopoulos, C. and A.T. Hable. "Engineering as an Enterprise of War and Peace", in *Engineering in Context*, S.H. Christensen, B. Delahousse, and M. Meganack (Eds.), Academica, Copenhagen, 2009
- Riley, D. *Engineering and Social Justice*, Morgan and Claypool, 2008.
- Schumacher, E. F. *Small Is Beautiful: Economics As If People Mattered: 25 Years Later ...With Commentaries*, Hartley & Marks Publishers, 1999.
- Vesilind, P.A. "The Evolution of Peace Engineering", in *Peace Engineering, When Personal Values and Engineering Careers Converge*, P.A. Vesilind, Ed., Lakeshore Press, 2005.

## Highlights to Date

- MS research of Ricardo Maldonado (EE). Development of a low cost power inverter for use in Bangladesh.
- MS research of Davis Chacon (CE). Development of transportation systems in rural areas of Perú.
- Guest lecture in GERE 6056 Environmental Decision Making, November 9, 2010.
- Travel to Duchity, Haiti, March 13-19, 2011. Investigate potential collaborative projects, including improvement of design of composting toilets. Possible recruitment of a qualified graduate student to be supported by the project.
- Co-sponsored purchase of Morgan & Claypool General Engineering, Technology, and Mathematics Collection with General Library; E-Book access to entire UPRM community.
- Coming soon: [greatidea.uprm.edu](http://greatidea.uprm.edu)

## Partners & Advisors

- Instituto Universitario para el Desarrollo de las Comunidades (Luisa Seijo and Francisco Maldonado)
- Centro Universitario para el Acceso (Lisette Rolón)
- Youhaiti (Gigi Pomerantz; authorized use of photos in banner)
- Howard University Appropriate Technology Group (John Tharakan and John Trimble)
- CIVIS/UPRM General Education Initiative (Efraín O'Neill)
- Interdisciplinary Group on Philosophy, Engineering, and Technology (Hector Húyke)
- Social, Ethical, and Global Issues (SEGI) in Engineering Program (UPRM College of Engineering)
- Strategic Engineering Education Development (SEED) Office at UPRM (Aidsa Santiago)
- UPRM General Library (Jacquelina Alvarez)

## Some Views & Challenges

Natural Capitalism	Traditional AT	New Criteria	
<ul style="list-style-type: none"><li>• Market driven</li><li>• Money</li><li>• Additive and Subtractive</li><li>• Limited natural resources</li><li>• Natural resources waste</li><li>• Social waste</li><li>• <b>Real Cost</b></li></ul>	<ul style="list-style-type: none"><li>• Affordable</li><li>• Labor intensive</li><li>• Flexible</li><li>• Localness</li><li>• Community based</li><li>• Regional Independence</li><li>• Decentralized</li><li>• Non Authoritarian</li><li>• <b>Benefit community</b></li></ul>	<ul style="list-style-type: none"><li>• Long-term assessment</li><li>• Facilitate nearness</li><li>• Prostheses test</li><li>• Benefit Assessment LCA</li><li>• Reduce suffering &amp; injustice</li><li>• Minimize use of armed force/violence</li><li>• <b>Broad and Critical</b></li></ul>	<ul style="list-style-type: none"><li>• Pursuing broad, interdisciplinary research without sacrificing technical depth</li><li>• Advising students on taking a leadership role in directing their own research</li><li>• Helping students to discern career ambitions and assess benefits and risks of research in AT</li></ul>

## Please Give your Input

Please examine a copy of the draft survey. We would very much like your feedback and suggestions.

**PLEASE TAKE ONE** →

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