Okayama University – The Sustainable University

Some Thoughts Towards a Vision

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Abstract

As it seeks to promote Education for Sustainable Development as part of its RCE and global responsibilities, Okayama University has an opportunity to demonstrate what the university of the 21st Century will be like. This paper takes a visionary look at the campus management, curriculum, research and community engagement practices of Okayama University in 2020 – and sketches a picture from which we can "backcast" to identify the steps that need to be taken to achieve the vision. However, the paper begins with a cautionary note about the "Tao of Prius".

The Tao of Prius[i]

Today I would like to tell you about the Tao of Prius.

The new Prius II is now so popular that it's back-ordered by months in the United States, even after Toyota boosted production there by more than 30%.

Toyota expects more than two million hybrid petrol/electric cars on the road by 2010.

Prius II was voted *Motor Trend Magazine's* Car of the Year Award for 2004. It also won the coveted Best of What's New Grand Award from *Popular Science Magazine* and *Automobile Magazine's* 2004 Design of the Year Grand Prize – and North American Car of the Year for 2004.

What makes it so special?

The Prius is propelled by a parallel hybrid system of two power sources - a petrol engine and an electric motor – which operate independently or together to give the world's best fuel consumption and lowest levels of pollution.

The electric motor is driven by a relatively small battery - that never needs plugging in for recharging. This electric motor serves as the sole power source whenever a petrol engine would be relatively inefficient - such as slow-moving traffic jams, idling, and under light acceleration. Under these conditions, the petrol engine is automatically switched off, and the electric motor does all the work - completely eliminating fuel consumption and exhaust emissions.

Whenever the driver needs more power than the electric motor can generate, the petrol motor automatically starts up.

The secret of the Prius hybrid system is its regenerative braking system - this recovers the kinetic energy from braking and deceleration that is otherwise wasted. The electric motor then serves as a generator converting this kinetic energy into an electrical charge for the hybrid battery.

The new Prius consumes less than 5 litres of fuel per 100km, and releases half the carbon dioxide emissions of a comparable petrol car.

But what exactly does the Prius really represent?

Let me tell you about the Tao of the Prius. I will tell you of this new tao – which, as you know, is the Chinese word for “path” or “way”.

The Prius teaches us an important lesson about the marketing of green technologies and the limits of consumer commitment to a better world.

The original 1997 Prius beat off competition from Honda to become firmly established as the world leader in hybrid technology.

With this market dominance, Toyota had an important decision to make.

It could design Prius II as a near-zero-emission vehicle or compromise to make the hybrid-technology more widely accepted by the mainstream consumer.

On the one hand, Toyota could aim to secure eco-vehicle status for the Prius. This would mean keeping the small engine capacity, low acceleration and small passenger shell and load space of Prius I - and putting its entire budget into R&D for better mileage and lower emissions.

Or Toyota could maintain the hybrid technology but increase the size of the engines in order to support a larger passenger load, plus all the luxury extras that seem to sell big.

And here we are getting close to the Tao of Prius.

Instead of choosing between these options, Toyota sought modest improvements in all areas.

It took its original hybrid sedan and made it six inches longer, gave it more interior room, and boosted its acceleration, all the while improving mileage and lowering emissions. And all for the same price.

The choice was probably simple and obvious for Toyota is a company that listens closely to its market.

This means not just increased speed, power, and headroom, but also improved environmental performance.

And so we arrive at the Tao of Prius: Toyota is not only challenging the established order of gas-powered vehicles. It’s also recognizing that consumers want the performance they’ve come to expect from traditional vehicles, but all other factors being equal they will choose the greener product.

Does this story have lessons for us in advancing sustainability at Okayama Univeristy?

The marketing message for the new Prius is this: “Do you love to drive and still have time to care about the planet? Now you can have it all.”

Don’t take my word for it -- this is Toyota’s pitch. “High performance that’s also good for the environment,” said one recent ad.

Don’t get me wrong: Despite our unsustainable addiction to the petrol driven engine, we need technical innovation of all forms - and although the Prius still has a petrol-powered engine - the hybrid technology can be used with another power source. In that sense, Toyota is pushing the

envelope and moving us toward a sustainable world - and, it's worth mentioning, doing so much faster than some other companies we could mention.

Yet. If the Tao of Prius - targeting consumers who want to achieve sustainability but without major sacrifice - represents the company's best guess of the average consumers' depth of environmental commitment, then we may be in trouble over the long term.

So what is the Tao of Sustainability for Okayama Education?

The Tao of Sustainability at Okayama University

Universities and colleges have always played a major role in supporting society in its search for a better world. We are the source and the drivers of the theoretical debates, technological innovations and practical implementation needed to create a sustainable world.

However, let's not forget three warnings from ten to fifteen years ago.

The first was from Dr Ted Trainer from UNSW who has warned that we need to be aware of the dual impact of the formal curriculum of our degree programs and the hidden curricula of our operations, which together can either reproduce or challenge the socially and ecologically unsustainable values of "industrial, affluent, consumer society".[ii] These values, he said, include the desirability of economic growth and a competitive economy, the importance of self-advancement, and the correctness of allowing the market to determine economic and social priorities – all of which are enshrined in our preference for "objective" content, individualistic teaching methods, competitive assessment strategies, "rock star" research rating reward systems, traditional campus operations, purchasing policies that give priority to best price not best value – and the many common excuses for not making the important changes we need.[iii]

The second warning was from Professor William Berberet of Willamette University who reminds us that, no matter what we, as committed minority might think or hope for, the environment has been only "a minimal factor in mainstream educational thinking".[iv] Indeed, he warns that the converse is true - education has played a key role in perpetuating unsustainable environmental practices:

> Historically, the values of universities and colleges have mirrored those of the larger society. Not only has education uncritically accepted the association of progress and the unfettered growth economy, it has trained the engineers and managers, performed the research, and developed the technologies which in aggregate have had such a devastating impact on the environment. A fundamental reorientation now needs to occur with the development of new assumptions undergirding education which treat the interactions of ecological processes, market forces, cultural values, equitable decision-making, government actions, and environmental impacts of human activities in a holistic, interdependent manner.[v]

The final one is from Professor David Orr of Oberlin College n the USA who reminds us that how we teach is often more important that what we teach:

> Process is important for learning. Courses taught as lecture courses tend to induce passivity. Indoor classes create the illusion that learning only occurs inside four walls isolated from what the students call, without apparent irony, the "real world". Dissecting frogs in biology class teaches lessons about Nature that no one would verbally profess. Campus architecture is crystallised pedagogy that reinforces passivity, monologue, domination, and artificiality.[vi]

These three warnings are very important in thinking about how we respond to the Tao of Sustainability at Okayama University.

When developing Prius II, Toyota concluded that a policy based upon “sustainability without sacrifice” is the route to success. Perhaps, many of our colleagues and students are similar – they generally want to achieve sustainability but without making too many sacrifices.

It is at points like this in talks like this that the speaker embarks on a list of prescriptions for integrating Sustainability in Higher Education.

And we get a lecture on what we should be doing to improve:

- Energy efficiency on campus
- The use of renewable resources
- Waste reduction, recycling and reuse
- Pollution prevention measures
- Green purchasing policies
- Sustainable transport planning
- Biodiversity on campus
- Ethical investment funds for institutional reserves
- Whole life costing models in all financial systems
- The Integration of SD into all subjects
- Multidisciplinary working groups
- Minimal waste generation in research and teaching
- Ethical principles in use of animals in research and teaching, and
- Collaboration with and service to the community.

I’d like to avoid this sort of “finger-pointing” lecture and, instead, sketch a vision of Okayama University in the not too distant future - a future scenario from which we can back-cast to write the history of the changes we need to make.[vii] Let me describe how I see the Okayama University of tomorrow. How far away that ‘tomorrow” is, is for our new UNESCO Chair and all our colleagues to decide.

Mission

The mission of Okayama University is to be a model of sustainability for the city, for Japan, and the world - and, today, we can see the success of this mission in how the institution looks, how it was built, how it is managed, how it feels to live and work there, in what people learn by studying and researching there, and in the attitudes and values that are nurtured in all its programs and activities.

Design and construction

The Centre for Applied Sustainable Technology is a good example of the new generation of non-disposable buildings. Designers realized that it was more conserving of resources to build once well, rather than repeatedly and badly. The Centre was designed for a 1000 year service life. No one was surprised to learn that this didn't cost fifty times more than a similar building designed for a 20-year service life.

The building was sized and designed to live within its own energy cycle budget. Exterior landscaping was an integral part of the building design. Even though it is located in a relatively warm climate, its primary cooling systems consist of flow-through ventilation, and super-efficient windows.

Photo-voltaic panels were used as integral building elements, worked into the facades and decorative details of the structure itself. Much use was also made of passive solar principles and the use of plants to assist with building comfort.

The inside of the Centre was not decorated so much as landscaped. When architects began to acknowledge that people are a part of nature, their indoor environments started to become richly

textured, varied, colourful and alive, decors began to shift toward a renewed use of stone, wood, bricks, plants, water and gravel, sand and rocks. The living "decorative elements" also provided important indoor air quality services and a subtly changing environment as plants grew, blossomed and multiplied.

Waste minimization

The rubbish bins and recycling containers so common in the twentieth century have nearly disappeared. Recycling is a standard part of campus life, and much work has been done on reducing wastes at source.

Food services use only durable cutlery and dishes. Paper has been largely replaced by electronic messaging and knowledge management systems.

Many students use portable computers with CD ROM libraries for their courses - as we came to realise that we could provide free laptops to every student when the total life cycle costs of conventional books, magazines, journals, paper, paper mills, transport costs, the storage costs of maintaining large libraries, road wear during shipments of educational supplies, land fill disposal costs, compensation claims for injuries in the shipping and publishing business due to heavy lifting, and water and air pollution cleanup costs were all factored into the equation.

Transport

Okayama University is a quiet place. This would not have been the case in the late Twentieth Century. Gone are the hydrocarbon fumes and engine noise so familiar in those days.

Electric and hydrogen powered vehicles have replaced the old cars, even the Prius - and there are far fewer of them.

The campus has been re-designed around the needs and abilities of pedestrians. Buildings have been clustered according to the functions and activities they support, and integrated with student residences, shopping, sports and entertainment facilities. These in turn have been situated for easy access to Okayama’s public transport system.

Learning

Okayama University is not primarily its buildings, solar panels and flower beds. It is much more a place within which the skills, attitudes and values of citizens are nurtured and challenged. The contributions made in this area were the work of every staff member, lecturer, professor, administrator and student. Some of the most important beginnings came from simple, rather undramatic changes.

An architecture lecturer started describing wood, not as a dead physical substance with certain properties, but as a living gift of nature. Her attitude, that wood was a material to be respected, shaped carefully and used judiciously was something that students in the program could see in the planning of every learning activity. They could feel the professor’s expectation that when they graduated, they not only had an economic role as productive employees, but also an environmental role in sustaining the planet which made their profession possible - and a social role to express through their work their pride in excellence which once characterized the medieval guilds.

A medical professor explored with students how human health is a function not only of disease organisms but of the total person-environment relationship. Through their discussions, the work of health care professionals acquired new meanings no longer limited to the treatment of pathology,

but open instead to the full range of actions (and inaction) that prevent human sickness through training, which creates and maintains healthy environments.

More important, yet, professor saw teaching as a vital part of building capacity for sustainability. They wanted their graduates to have well developed sustainability competencies that would equip them to find positions in sustainability-minded companies and to lead the transition to sustainability in firms that are not so cutting-edge.

As David Orr wrote as far back as 1992:

> Process is important for learning. Courses taught as lecture courses tend to induce passivity. Indoor classes create the illusion that learning only occurs inside four walls isolated from what the students call, without apparent irony, the "real world".
>
> Dissecting frogs in biology class teaches lessons about Nature that no one would verbally profess. Campus architecture is crystallised pedagogy that reinforces passivity, monologue, domination, and artificiality.

The ways we organise for students to interact with each other debating alternative perspectives and solving real-life problems are vital to the development of sustainability competencies such as the ability to work in teams, to listen attentively and empathetically, and to think in multiple ways such as:

- Whole system thinking
- Multidisciplinary thinking - scientific, economic, social, ecological, political, etc
- Logical thinking
- Applied thinking
- Problem-solving thinking
- Local-global thinking
- Ethical thinking
- Creative thinking

Administration and management

Administrators and managers at Okayama University also began to understand the sustainability aspects of their roles. Their concern with cost effectiveness continued, but these decisions gained a new context when environmental and social costs were included in decision-making. They called this a “best value not lowest price” policy.

Paradigmatic changes

The watershed in administrative practice was reached when the Environment Committee was abolished.

When we realised that environmental and social issues were essential concerns in all enlightened management decisions, we realised that setting up special bodies to deal with matters of such central importance to everyone was just a way of avoiding responsibility.

Another major step was the abolition of courses on environmental issues, resource management and sustainable development. When all courses well designed from a social justice and environmental perspectives - as well as economic and educational ones, sustainability was a natural part of every course.

For some programs like mathematics, the implications were modest. In other programs such as agriculture, mining, business management, architecture, law, engineering, medicine and psychology the implications were profound and thoroughgoing.

Community partnerships

When education and training became ways of learning how to integrate meeting human needs with ecological and social realities, Okayama University became an active partner in community development. The concept of "partnering" led to another shift in consciousness – the movement toward more inclusiveness and participation in all aspects of community/regional development.

How to make the transition toward a sustainable institution came to be understood less in terms of the "enlightened leadership" of the learned few over the many - and more in terms of discovering ways of promoting synergy and collaboration, and capturing the unique contributions of each person toward a shared community goal.

Conclusion

It is easier to identify these changes now, in retrospect, than it was to see their operation at the time. Had someone come forward with a detailed agenda for our transition to Okayama University it probably would never have happened.

What did happen, however, was the emergence of a shared awareness that our customary ways of living, learning and building our culture had to change, and a shared willingness to begin exploring alternatives and actions. What twenty years ago would have been called a "green dream," came into being through the dreams of all of us, dreaming a new dream for our future, a little bit at a time.

Notes

[i] The story is an adaptation of Joshua Skov (2004) 'The Tao of Prius', *Greenbiz Magazine*, January. Available on-line at URL http://www.greenbiz.com/news/columns_third.cfm?NewsID=26312

[ii] Trainer, T. (1990) 'Towards an ecological philosophy of education', *Discourse*, 10 (2), p. 105

[iii] Ibid., p. 107

[iv] Berberet, W.G. (1989) *Education for Sustainable Development*. Unpublished testimony prepared for Globescope Pacific Conference, Los Angeles, p. 3.

[v] Ibid., pp. 4-5.

[vi] Orr, D. (1991) 'What is education for?', *The Trumpeter,* **8**, p. 101.

[vii] The story is adapted from 'A green vision', in *Green Guide: A User's guide to Sustainable Development for Canadian Colleges*, National Roundtable on the Environment and the Economy and Association of Canadian Community Colleges, Ottawa, 1992.