THE PROCESS OF CO-EVOLUTION IN TEACHER EDUCATION USING TOOLS OF TECHNOLOGY

Oleh

FITRI SURAYA MOHAMAD

Head
E-Learning Unit
Universiti Malaysia Sarawak
94300 Kota Samarahan
Sarawak, Malaysia
Tel +6 082 671 000
Fax +6 082 671 579
email: mfitri@calm.unimas.my

ABSTRACT

The business of teaching teachers today is one of the most challenging fields in this digital era. Not only does a teacher educator need to be frequently updated with the current issues in specific subject-matters that relate to the core subjects taught, he/she needs to co-evolve with new unchartered challenges of the increasingly networked community around him/her. To survive and remain relevant as a professional educationist in this era of swift change, a teacher educator must embrace the concept of co-evolution with his/her peers, student teachers, curriculum planners, public and corporate influences, including social and political pressures put forth by the mass public. The teachers who graduate from local teacher education programmes oftentimes feel "trapped" between the idealistic world of education and the reality of classroom environments; if only all the coexisting elements of influence collaborate, compete and co-evolve with one another, these graduate teachers will be realistically prepared to undertake their teaching assignments. This paper introduces the concept of co-evolution, in relation to current practices in teacher education in Malaysia. This paper looks into the potential benefits in harnessing the convenience of today's technology, to enable an effective way to co-evolve, to meet today's demands for better teachers for the 21st century.

INTRODUCTION

First, let's examine this observation by Phillip Long, a Senior Strategist for the Academic Computing Enterprise at the Massachusetts Institute of Technology, USA:

> *The next several years will mark a transition in the format of teaching, a transition marked **less by revolutionary changes in technology** and **more by an exploitation of the potential that current technology developments afford to support learning in more heterogeneous settings**. Computing power will continue to grow enormously. In fact, it appears that Moore's law was*

*conservative. Even without the radical chip fabrication breakthroughs that loom on the horizon, processor speeds of 10 GHz are already being produced in test quantities. **Yet, the sheer power of computation does not link closely with changes in teaching**. Today's laptops can present extraordinary visualizations of electromagnetic force fields, for example, but this graphic power does not necessarily improve students' conceptual understanding of physics. **It takes someone—some faculty member—to integrate this capability appropriately into an instructionally meaningful classroom experience. [emphasis mine].**
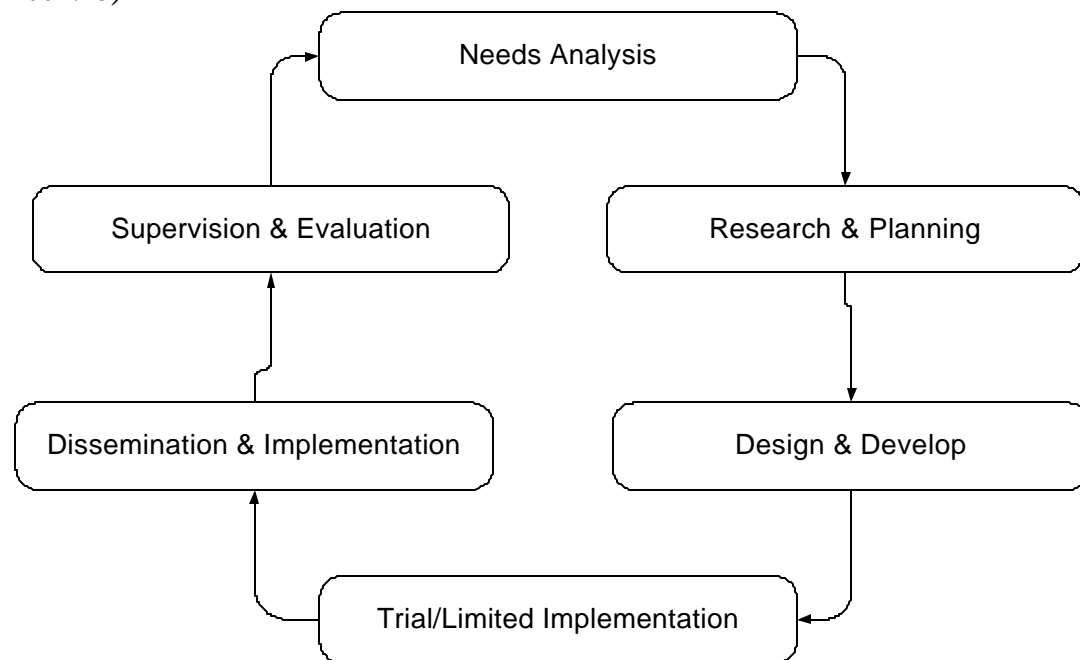
(Phillip D. Long, 2002)*

We acknowledge that we are now in the era of life-long learning. Technology is here to stay. And the ingredients that constitute good teaching and learning lie in the way we adapt, manipulate and conquer the our thinking tools. Technology is just an enabler, and it will never replace good teaching and learning. But why is it that we are still slow in adapting to the pace of change, as it transpires in the "real world", a.k.a. the corporate/business marketplace? Aren't we the people who are responsible in getting our learners ready for that world? Are we preparing our students to be competitive and compatible for that world of information manipulation?

This paper discusses the potential of integrating the concept of co-evolution in our current teacher education practices, using the advantages of today's technology. The concept of co-evolution originates from the field of Biology. It denotes the process that takes place when two or more ecologically interdependent species become intertwined in time. As they adapt with their environment, they also adapt with one another. Teacher Education is one of the primary veins of our country's education system. Think about this: Do we channel any effort to inculcate a collaborative learning environment between the teachers, teacher educators, and the other key players of curriculum design and development? Are there any functional space for teachers (individually and in teams) in school to share ideas, experiences, skills and exposure on the way the curriculum is deployed, with the rest of the key players in curriculum development? Are the teachers co-evolving with the scope and nature of curriculum change and reviews? Is it even plausible to adapt this concept of co-evolution in our national teacher education training practices?

THE NATIONAL EDUCATION SYSTEM

In the national education system, a lot of elements come into play to make the system work. In deploying the national curriculum, for instance, there are many teams of professionals within the ministry that work together to help propagate necessary knowledge and skills to ensure a smooth execution of the prescribed curriculum. The chart below briefly illustrates this process (*see Figure 1*):

Figure 1: The Curriculum Cycle (Source: Curriculum Development Center, 2001:25)

```
                    ┌──────────────────────┐
              ┌────→│    Needs Analysis    │────┐
              │     └──────────────────────┘    │
              │                                 ↓
┌──────────────────────┐         ┌──────────────────────┐
│ Supervision &        │         │  Research & Planning │
│ Evaluation           │         │                      │
└──────────────────────┘         └──────────────────────┘
              ↑                                 │
              │                                 ↓
┌──────────────────────┐         ┌──────────────────────┐
│ Dissemination &      │         │   Design & Develop   │
│ Implementation       │         │                      │
└──────────────────────┘         └──────────────────────┘
              ↑                                 │
              │     ┌──────────────────────┐    ↓
              └─────│ Trial/Limited        │←───┘
                    │ Implementation       │
                    └──────────────────────┘
```

Through these cycles, because of the multi-level teams who are involved in each stage of the planning and execution, the progression of the system is not as smooth as it is presumed to be (CDC National Report, 2001). A lot of looping between the stages occurs, thus affecting the end product of the system to be implemented in the school (Sharifah Maimunah, 1991:236). The teachers, being the team who put into operation the curriculum systems tabulated through the process (as shown in *Figure 1*), are obligated to follow specific requirements of the curriculum. Because of the diverse nature of learners and learning styles that these learners employ, plus the disparate nature of teaching talents among the teachers, the quality of curriculum execution vary from one group to another. There is little or no space for teachers to share their experiences, opinions and input to the implementation process, and hence, the performance aspect of the curriculum in general is very hard to gauge or to be analyzed critically.

Figure 2: Curriculum Review Process (Curriculum Development Center: 2001:47)
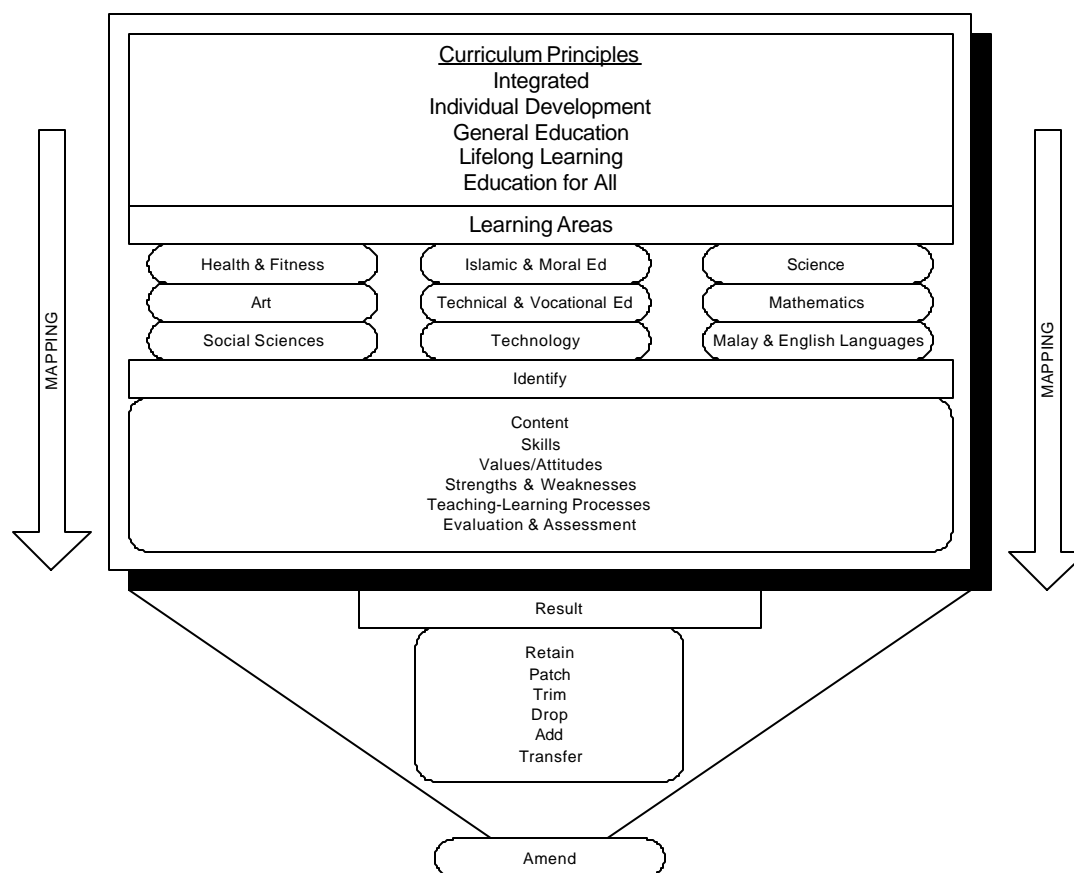
As per shown in *Figure 2*, the curriculum review process involves multidisciplinary expertise and involvement. Due to this, many issues and problems have cropped up, as per identified in the CDC National Reports (). Some of the common issues discussed were:

1) Disparity between curriculum development process and the political will of the country
2) Varied levels of expertise among curriculum developers
3) Dissonance between intentions and outcomes

For the first two issues highlighted above, they represent the political and human resource developments that intervene (to a certain degree) the process of curriculum design and development. Both problems are time- and case-sensitive, and they rely on alertness on world events to enable possibility for problem solving.

However, for the third issue for the list above, much could still be done at the teacher education sector. What is intended in the prescribed curriculum is not what is translated in the deployment of the same set of ideas, concepts and skills, as per spelled out in the curriculum. The key causal factors that contributed to this issue are:

a) weaknesses in the dissemination strategy
b) varied interpretations of the curriculum concept and philosophy
c) advocacy of teaching-learning strategies that are unfamiliar and not readily grasped by teachers
d) difficulties in accommodating differing school environments

e) problems in support mechanisms necessary for the curriculum sustenance
f) problems with teacher attitudes
g) overdependence on commercially produced materials which may not be well-suited for students' ability
h) problems with school's political constraints
i) overemphasis on examination results
j) problems with establishments of large classes, which impinge on quality of teaching-learning

It is apparent that these causal factors are inherent throughout schools in Malaysia, and the Ministry of Education has devised many training initiatives to help address some, if not all, of these issues. More work is needed to ensure that the knowledge and exposure given at these training programs are effectively translated and deployed at the schools, upon the return of the teachers from the training programs.

The key solution to most, if not all, of these issues, is **effective communication environments and opportunities**. As human beings, we are born to interact with one another as a tool for survival, and through these interactions, we learn and adapt to our ways of thinking, which later translates to the course of actions that we develop and deploy in our individual lives. Hence, going back to the focus of this paper: the question is, how do we communicate with *everyone* involved in the curriculum design, development and deployment and review process, in a systematic, effective and sustainable manner?

As of now, there is a department at the Ministry of Education, which is dedicated to manage and monitor developments in teacher education initiatives across the country. There are more than 10 centers for teacher training programmes, including those that are set-up at the public universities in the country. To deploy a systematic, effective and sustainable web of communication between all players in the system would require an extensive amount of effort, especially in the management, monitoring and facilitating aspects of the communication systems.

THE PROMISE OF TECHNOLOGY

At the rapid pace of information and communications technology (ICT) development these days, we are bombarded by a myriad of choices to interact and share information and ideas with one another. Unlike the corporate/business world, the education sector has always been slow to adapt to the agility of technology applications. In the context of teacher education, we have yet to capitalize on the applications of ICT to suit the needs of our teacher education practitioners around the country.

What could ICT applications do? A lot. These are some of the common features of ICT applications which are already being adapted and manipulated in the corporate/business workplace, and could easily be transcended into our educational setting:
1) The pervasive nature of information publishing on the web
2) The plug-and-play features of most technology tools today, that enable most people to connect, communicate and collaborate effortlessly
3) The rapid growth in *web-based learning* (or termed as *E-Learning*) due to the emphasis in life-long education to remain relevant and competitive in the workplace

Training is inevitable, and it must happen coherently and consistently. Technology simplifies the process, in that it allows the creation of learning communities which feed on constant and relevant input from multiple points of authority in various fields of learning, especially those related closely to teaching-learning developments. Online training courses, for instance, enable multiple users to use the same core training materials, which can be reviewed, added, edited and deleted, upon relevance of time and nature of events that evolve around the scope of the National Education System.

THE CO-EVOLUTION FRAMEWORK

We have long acknowledged the power of collaboration, specifically in the realm of teaching and learning. Collaborations enable individuals and teams to communicate and share ideas and resources with one another; and, to sustain the collaborative linkages between individuals and teams of educators, the interdependence dynamics must be present and relevant, throughout the entire collaborative process. However, many do acknowledge the disparate nature of collaborative environments, especially in making sure the relevance of their environments in lieu with

To understand the potential of utilizing the co-evolution concept in teacher education, below is an adapted version of a comparison table between Traditional Collaboration versus Co-evolution, which was originally by Eisenhardht and Galunic (2001), for the corporate/business world:

	Traditional Collaboration	Co-evolution
Form of Collaboration	Frozen links among different school environments	Shifting webs among evolving learning environments
Objectives	Efficiency and economies of scope	Growth, agility and economies of scope
Internal dynamics	Collaborate	Collaborate, compete and enhance
Focus	Content of collaboration	Content and number of collaborative links
Role in Education system	Drive and execute collaboration	Set, drive and execute collaboration context
Incentive	Varied	Self-interest, based on individual school-unit performance
Operations metric	Performance against budget allocated per fiscal year	Performance against peers in learning growth (benchmarked by specific development metrics, set by Ministry etc)

(Adapted from Eisenhardt, K.M. and Galunic, D.C. (2001). "Coevolving: At Last, A Way to make Synergies Work". In Organizational Learning. Harvard Business School Press: Boston, MA. Page 115)

These ideas are derived from the corporate/business marketplace, as these industry players are realizing the need to reflect and react on their own processes of business growth. In the

scope of Teacher Education, we can easily transfer these ideas within the performance matrix, which can be designed with a systematic methodology for implementation, monitoring, and review. Teachers must be challenged cognitively, and their performance and competencies must be valued through multiple perspectives, including benchmarking them with other teachers who are actively teaching in other parts of the world.

The Ministry of Education has to seriously advocate the building of a knowledge-based community of practice, among all players involved in the field of curriculum design, development and review in the country, using a suite of appropriate ICT applications that could transcend the barriers of space and time. Some recommendations include:

a) opening a space for incubating ideas, experiences and knowledge among educational practitioners to stimulate personal growth and development, with the core perspective of enhancing the Ministry of Education's vision and mission
b) designing and deploying a simple diagnostic framework that could be translated and applied across all levels and divisions within the Ministry of Education (transcending barriers between the headquarters and the schools throughout the country)
c) developing a methodology and a competency matrix to enable the Ministry to investigate the potentials of individuals and specific units within the Ministry, that could be used to propagate new and unique ways of learning

(Adapted from Cope, M (1998) "Leading the Organization to Learn". Pitman Publishing: London; and Kalyan S. Basu (2002). "Strategy and Capability Planning at I3L". Unpublished work. Available Online at http://groups.yahoo.com/group/trdev.)

CONCLUSIONS

To enhance the capability and competencies of our teachers, to ensure the successful deployment of the national curriculum, it is imperative that we must start deploying methodologies that could accelerate individual and team growth among our teachers. Work can begin with those who are enrolled in the current teacher training programs, and because the provision of technology at these traning centres is often adequate and contemporary, they are the best groups to experiment with. As a massive organization that is dedicated to educate everyone in the country, using carefully designed syllabi, the Ministry of Education must move along to benchmark the values of its successes, based on current market trends and needs.

With structured but flexible methodologies to capture, share, collaborate, assimilate and adapt knowledge and ideas from everyone involved in the Education system, the curriculum will become more relevant and contemporary, thus systematically eliminating deadwood items or factors in the design and deployment of the National Education System. Only then will we be able to competitively raise the standards of our teachers and the quality of teaching and learning in our classrooms to meet the characteristics of a globally acclaimed education.

REFERENCES

Cope, M (1998) "Leading the Organization to Learn". Pitman Publishing: London

Curriculum Development Center National Reports. (2001). Kementerian Pendidikan
      Malaysia: Malaysia.

Eisenhardt, K.M. and Galunic, D.C. (2001). "Coevolving: At Last, A Way to make
      Synergies Work". In <u>Organizational Learning</u>. Harvard Business School Press:
      Boston, MA.

Long, Phillip D. (2002). "Needed: Creative Teaching & Commitment". EDUCause Review.
      May/June 2002 edition.

Kalyan S. Basu (2002). "Strategy and Capability Planning at I3L". Unpublished work.
      Available Online at http://groups.yahoo.com/group/trdev.