

Science and Technology Human Resource Development: E-learning initiative for ASEAN

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Abstract

ASEAN Vision 2020 set a long-term goal for science and technology development to develop “a technologically competitive ASEAN, competent in strategic and enabling technologies, with an adequate pool of technologically qualified and trained manpower, and strong networks of scientific and technological institutions.”

The ASEAN Virtual Institute of Science and Technology (AVIST) has been proposed and endorsed by the ASEAN Sub-Committee on Infrastructure and Resource Development (SCIRD) and the ASEAN Committee on Science and Technology (COST) to answer to ASEAN Countries need for Science and Technology (S&T) human resource development (HRD).

The main purpose of setting up AVIST is to contribute to the development of science and technology human resources in ASEAN countries through the provision of vocational training, and continuing professional educational opportunities to various S&T sectors by leveraging on the innovative use of information and communication technologies such as satellite Internet as well as Web-based courses and programmes.

This paper will discuss AVIST in sufficient detail. Although AVIST's operation is still in its evaluation phase, there have been positive indicators pointing

to the success of the project. AVIST will be an example of a region-wide e-learning effort.

1. Introduction

ASEAN countries place high importance on the need for science and technology (S&T) human resource development (HRD). This is demonstrated through the ASEAN Vision 2020 which set a long-term goal for science and technology development to develop “a technologically competitive ASEAN, competent in strategic and enabling technologies, with an adequate pool of technologically qualified and trained manpower, and strong networks of scientific and technological institutions”.

In carrying out this mandate, the ASEAN Committee on Science and Technology (COST), has identified S&T human resources development as a flagship project, with the view to addressing the needs of business and industry, creating an environment for life-long learning and innovation, supporting the training of trainers, updating the qualifications of S&T professionals and practitioners, and developing young technology entrepreneurs.

The S&T HRD programme of ASEAN COST includes a virtual mode of delivery through the ASEAN Virtual Institute of Science and Technology (AVIST).

2. Need for S&T human resource development

A study conducted in 2002 by the ASEAN Sub-Committee on Infrastructure and Resource Development (SCIRD) shows that the need for S&T human resource development range from basic work-related skills training as well as information and training on public health care issues for factory workers, fishermen and farmers on one end to the very high-end, value-added continuing professional education (CPE) needs. Furthermore, in some countries where the necessary infrastructure are already in place, the needs are content-driven while in others the more urgent need is for the development of an infrastructure network to facilitate the exchange and sharing of experience and research output.

3. Information and Communication Technology (ICT) Infrastructure of ASEAN Countries

As widely known, various countries within ASEAN displayed tremendous diversity in their ICT infrastructures, accessibility, and quality of access.

Given the clear disparity in technical infrastructure development and accessibility to information and communications technology (ICT) services that currently exist among the ASEAN countries, any training provisions planned should be delivered using a range of technologies in an appropriate and cost-effective manner. The primary focus should be on the provision of training rather than the technology to deliver these training.

With the heterogeneous environment, it is desirable to establish a different model for content delivery to the ASEAN countries.

4. ASEAN Virtual Institute of Science and Technology (AVIST)

4.1. Establishment of AVIST

The concept for the establishment of ASEAN Virtual Institute of Science and

Technology (AVIST) was endorsed by ASEAN Summit in 1999. After then, ASEAN Committee on Science and Technology (COST) developed the concept as a part of continuing professional education.

A series of planning meetings have been organized by UNESCO from 1999-2001.

In the pilot phase, Asian Institute of Technology (AIT) and Thailand Graduate Institute of Science and Technology (TGIST), National Science and Technology Development Agency (NSTDA) serve as AVIST Core Unit. TGIST handles operational issues while AIT acts as technical core center of AVIST.

4.2. AVIST Purpose

The main purpose of setting up AVIST is to contribute to the development of science and technology human resources in ASEAN countries through the provision of vocational training, and continuing professional educational opportunities to various S&T sectors by leveraging on the innovative use of information and communication technologies such as satellite Internet as well as Web-based courses and programmes.

AVIST's main objectives are to:

- Provide training through non-degree programmes consisting of short courses addressing the immediate needs of business and industry;
- Promote short-term exchange of research personnel;
- Provide opportunities for on-the-job training programmes.

4.3. General Operating Environment of AVIST

AVIST consists of a small *Core Unit* (Central Administrative and Content Center) collaborating in a flexible manner with *Partners* (through AVIST focal points) in each member country. Such partners can be Content Providers, Technical Service

Providers, or Local Partners. AVIST will get its course materials mainly from Content Providers within (or outside if that proves to be more cost effective) ASEAN institutions. It can also engage the service of Technical Service Providers from among ASEAN institutions.

4.4. AVIST Technical platform

To enable members of AVIST to cooperate, it is important that all must be adhering to a common platform for uniformity, ease of operation and maintenance.

AVIST has chosen an open source E-education platform VClass, developed by the Distributed Education Center, Asian Institute of Technology (<http://www.dec.ait.ac.th/main/projects.html>). Vclass is specifically designed for delivering on-line courses by two different methods – through virtual real-time classroom learning or virtual class on demand. In a virtual classroom setting, there is a synchronous (inter) activity in which students and instructors can communicate through interactive voice and video, while working together. In the “virtual class on demand” method, on the other hand, the learners use computer and communication technologies to work with remote learning resources, including instructors and other learners, but without the requirement to be on-line at the same time. It comes together with a Learning Management System and its own tools including an authoring tool.

As an open source e-learning system, VClass system can be adopted without any extra cost for the software. It is designed to work in virtual university environment where a virtual university composes of several distributed focal points. Each focal point represented logically operates as a point of present for the virtual institute or university.

Each focal point can have its own users, students, instructors, and registries. Cooperation among focal points within a

virtual institute like AVIST is carried out automatically by VClass provided all the enrollment rules and regulations are specified. Students are allowed to change their physical location to access AVIST, through VClass, at any AVIST focal point.

4.5. Course Contents

Course contents used by AVIST will be high quality. Initially, courses will be sourced from what is already available from ASEAN institutions (or even outside ASEAN) and adapt them to the ASEAN context before use. Such institutions could include academic institutions, government and non-governmental organizations as well as the private sector.

Where courses need to be developed from scratch, a proper course development protocol (involving the appropriate mix of content specialist, instructional designer, Web-based designers, creation and production services) will be in place to ensure that the final product meets the required quality and adequate learner support will be provided through both synchronous and asynchronous modes.

4.6. AVIST Pilot Courses

Three courses covering the following topics were identified, adapted and adopted as pilot courses for the evaluating period:

- a. Bioinformatics;
- b. Introduction to Technology & Innovation Management; and
- c. Sustainable Ecotourism Development

The courses adopted for the evaluation period involved more than fifteen instructors from various universities from within and outside ASEAN.

Currently, AVIST is in the process of evaluating its three pilot courses with participation from enthusiastic participants nominated from ASEAN countries.

5. Conclusion

Based on the data gathered and the feedback from different S&T sectors in the ASEAN countries, it is clear there is a need for an ASEAN human resource development initiative on science and technology. The ASEAN Virtual Institute of Science and Technology (AVIST) can serve as the vehicle for this by providing Web-based courses for the continuing education of sub-professionals and professionals.

For AVIST's model, the Internet is the key underlying technology for distance education, whether it is in a broadcasted or on-demand mode. The model takes into consideration the diversity of the conditions in the ASEAN countries. Flexible choices of communication technologies between the various components (local partners, national dissemination center and AVIST central content center) is adopted and adjusted to overcome various constraints. Various types of access points are provided depending on the available network and economic conditions of each ASEAN country.

AVIST will avoid duplicating efforts by adopting a network of institutions as support centers and/or local partners. By leveraging the strengths of individual institutions in the region, AVIST's success would result in everyone else's success, and would make member institutions shareholders in AVIST's future.

The key factor to the sustainability of AVIST's programmes is the quality of its academic content. However, the quality of content that the target user receives will also be dependent on the quality of delivery and access to the material. This means that a very important contributing factor to overall quality is the intra-ASEAN network.

The future of the operation of AVIST is promising. This is demonstrated by the enthusiasm and good response from ASEAN countries in the evaluation process.