

Chapter 5

A Holistic Approach to Greening TVET: A Case Study and Analysis of Bac Thang Long Economic Technical College Practices in Viet Nam

Abstract A word portrait is provided of the Bac Thang Long Economic Technical College with particular reference to short-term labor market forecasting, current long-term training programs, students' course preferences, monitoring internal quality, and relevance with particular regard to achieving internal and external efficiencies. The response of the technical college to challenges facing TVET in Viet Nam, greening practices, and implications of this case study to TVET providers and government policy and practice in Viet Nam are examined.

Keywords Short-term labor market forecasting • Students' preferences • Internal quality • Challenges facing TVET in Viet Nam • Greening practices • Soft skills

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Case study of successful approaches to developing skills in the context of transforming industries and the emergence of new green industries.

1 Introduction

International experience demonstrates that vocational training providers could play a significant leadership role in meeting the social and economic needs of greening. These training providers could integrate green concepts and processes into curricula and could implement green campuses, thereby preparing workers for new, changed, or emerging jobs in greening economies (NCWE and AED 2011). However, to stimulate the process of greening, current practices in curriculum development, links with industry, and patterns of training teachers need to be explored in order to provide targeted support for policy formulation and practice development in greening. This case study reveals these processes by analyzing a successful example of approaches toward provision of vocational training, including green skills development.

This case study was conducted at the Bac Thang Long Economic Technical College (BTL) in Ha Noi, Viet Nam and draws on multiple sources of information. It is an example of the successful implementation of skills development for green jobs, as set out in the TVET specialist deliverables. Data were collected through interviews with the college representatives, and secondary data were obtained from a variety of sources including college databases for student and staff records, and the college website.

This study suggests that current and future gaps in the green sectors (e.g., clean energy and green transport) are visible in Viet Nam. Many initiatives by aid organizations have produced a number of examples and approaches that need to be analyzed and implemented through formal TVET training. Current gaps in the *nongreen sectors* (the ones that have the most impact on greening economies) are not obvious, as these industry sectors are not “going green” at this stage. This research identifies future gaps in hospitality, construction, energy, and transport.

Directions for meeting the needs of the emerging green economy are sketched out in many government documents,¹ demonstrating the government’s commitment and awareness of the issues relevant to green growth. Implementation of the Viet Nam National Green Growth Strategy, for example, will have a significant impact on TVET in the country. Solutions suggested in the document include education, awareness raising, and technical assistance to implement and enlarge production models based on respect for communities and the environment. Another area of attention stated in the document requires education and training provision for developing and running ecocities, green rural areas, green housing, waste management, and improvements in energy efficiency (Government of Viet Nam 2012a, b). This strategy requires an action plan where the role of TVET will be clearly stated. MPI has been developing the plan since the end of 2012. The quality, adequacy, and availability of green training provided at all levels should improve as a result of this plan. Currently at the low skills level, some greening initiatives are visible in the country (for example, pilot projects at craft villages, the green industry action plan for Hoi An City by UNIDO); however, formal TVET (vocational technical colleges [VTCs]) is not heavily involved.

Many strategies relevant to green growth adopted in Viet Nam are designed to meet the dual challenge of rapid economic growth and environmental issues, including climate change, and social issues. Collectively, they suggest a national strategy to first, adapt to climate change; second, to further enhance ecological sustainability; and third, to invest in science and modern technologies. These initiatives present long-term strategies for achieving key goals in the context of green inclusive growth. Bearing in mind government intentions in terms of a greening economy (for example, the Clean Production and Energy Efficiency Project, 2011–2016), gaps in the training for green collar occupations, in the short term, will be

¹See, for example, Law on Environmental Protection (2005), National Strategy on Climate Change (2008), Green Industry Policy Framework (being drafted), Viet Nam Sustainable Development Strategy for 2011–2020 (2012), National Strategy on Environmental Protection to 2020 with Vision to 2030 (2012).

apparent. Targets such as an improvement in the productivity of raw materials, water, and energy; the minimization of waste and emissions; an increase in recycling and reuse; and the use of renewable energy (Viet Nam Government, draft) should be accompanied by skills development. Considering that a small number of institutions are able to start addressing these issues, and there are no specific plans in place, TVET in Viet Nam is ill-prepared to address the needs of industry with regard to the emerging green economy.

Bac Thang Long (BTL) has close links with local businesses to minimize the gap between TVET outcomes and job requirements. It uses well-established mechanisms to collect data through industry surveys, interviews, and workshops to ascertain the needs of industry and ensure that the content of courses is relevant to the skills required of students to undertake future employment.

Training programs are available for mid-level skilled occupations, and provisions are in place for students to transfer to university studies for high-level skills training. Student preferences and satisfaction are major influences when the college plans the content of long-term programs. Students receive workplace training as part of their courses, and their progress is regularly reviewed. They are fully supported by highly skilled teachers.

All courses are reviewed annually to ensure their relevance. For the training of existing workers, short-term programs have been specifically designed to meet industry needs. This is a good indication of quality training that is in demand by industry. Professional development is conducted regularly with teachers to ensure that their skills are up to date, and thus they are well qualified to teach students current theory and knowledge. Industry is fully involved in the professional development of teachers.

In anticipating greening of the economy, and in meeting the social demand for addressing environmental and social issues, BTL is proactive in introducing new courses and in effectively building awareness raising. Environmental legislation, which is the current attention of MOET, and the social responsibility mission of BTL, are the drivers behind these changes. The inclusion of generic green skills has not been addressed by the college, although it also pays keen attention to attitude development and takes measures to increase students' environmental awareness.

This case study concluded that effective practices in TVET provision observed at BTL could be scaled up in the context of green inclusive growth, as advocated by the government. Implementation of the Viet Nam National Green Growth Strategy will have a significant impact on TVET; therefore BTL could serve as an institution for driving forward green change. It could, for example, be a key, focal point member of a consortium² to assist with implementation of green skills best practices.

²International experience demonstrates that consortia are usually comprised of employers and industry organizations, training providers, and regulatory organizations. Funding is allocated by the government to those consortia that demonstrate best practices in green skills. These practices would then be implemented in sector-specific training.

2 Bac Thang Long Economic Technical College, Viet Nam

BTL is a public institution that started as a VTC that was built and supported by Bac Thang Long Industrial Park. In 2002, the Ha Noi People's Committee, and its Department of Education and Training, approved the transformation of the VTC into a semi-public college. In 2008, the institution changed its status to that of a public college. Now, it is an autonomous institution in terms of finance and human resource policies (such as personnel recruitment) and is located in Dong Anh, Ha Noi.

The experience of BTL is examined here as a case study of an innovative and interesting practice. In addition, many issues are revealed through this ADB project, for which the college is a microcosm in terms of issues, challenges, and prospects. The college experience is presented under two broad themes: existing and green practices. Existing practices ensure the relevance of skills development to the changing needs of the labor market in Viet Nam.

3 Relevance to the Society and Economy: Short-Term Labor Market Forecasting

TVET systems use different mechanisms to match skills supply and demand to reflect changes in the labor market and skills needs in their education and training programs. The approaches used could be implemented at different levels (such as the centralized–decentralized continuum) and could be holistic or fragmented. Approaches used by BTL are at the local level and are focused on short-term forecasting. The college uses qualitative needs assessment surveys and institutional dialogue (through a well-established and effective mechanism) to allow information about labor market needs and its translation flow into programs and courses. To achieve this, the college has close collaboration with local industry partners such as the Thang Long Industrial Park, Hoa Sao Media Group, Kim Cuong Media Corporation, Meling Plaza, Metro, Big C supermarkets, Van Tri Golf Company, Son Nam hotel, Ha Nam City, and Vinaphone. Annually (with the help of the Uniterra program³), the college conducts needs assessment surveys with local businesses to identify up-to-date information on the nature of companies, the composition of skills and qualifications of employees, their education, salaries, the

³The Uniterra is a volunteer program for Canadians to have the means to take concrete action and to make a real difference by applying their skills and experience. The Uniterra program is jointly run by World University Service of Canada and the Centre for International Studies and Cooperation. It is undertaken with the financial support of the Government of Canada provided through the Canadian International Development Agency. www.uniterra.ca/en/. The Uniterra program at the college helped to establish links with industry and to conduct needs assessment surveys.

ways companies advertise vacancies, approaches for recruitment, importance of workplace learning, professional qualifications, soft and technical skills for their future employees, specific technical skills required for junior level employees, relationships and channels of communication with TVET providers, quality of TVET graduates, and the training they organize for new employees. Information collected ensures that employers' views are well known to the college, helping it to plan relevant training programs and courses and to accommodate their requests in the college's plans, teaching, and training practices. This decentralized approach to labor market forecasting, together with MOET regulations and circulars (that translate policy decisions), are the main sources for planning new and adjusting existing programs.

4 Current Long-Term Training Programs

Currently, there are 12–15 long-term vocational training programs organized by three faculties:

Faculty of Engineering and Information Technology

- applied computer science;
- computer networking management;
- computer installation and repair;
- electronic engineering and telecommunication technology;
- telecommunication station installation;
- industrial and consumer electronics;
- industrial and consumer electricity;
- law; and
- office administration.

Accounting and Finance Faculty

- administration accounting;
- banking and finance; and
- business accounting.

Tourism and Commerce Faculty

- business in commerce and services;
- Chinese;
- cookery;
- English;
- Japanese; and
- tourism and hospitality.

Business Accounting and Telecommunication Station Installation are among the most popular programs. Electronic Engineering and Telecommunication Technology, and Industrial and Consumer Electronics are the least popular among students. The length of study depends on the educational background of enrolled students: 2 years for high school graduates, and 3 years for secondary school graduates. After completing college programs, students receive a TVET certificate at the intermediate level.

4.1 *Students' Preferences*

Although employers' needs are extremely important, meeting students' preferences is another factor that plays a significant role in determining the types of long-term programs and short-term training courses. This is particularly important because TVET has relatively low status in Viet Nam, with most school leavers preferring to enter university instead. Table 1 illustrates the key issues: the number of students in long-term vocational training has declined since 2008 (from 3779 to 1706 in 2013), when the college was established in its present format.

The number of students enrolled in short-term courses over the same period (2008–2013) increased from 700 to 4000. This shows the demand for specific, targeted skills development at different levels. The following short-term training courses, plus additional ones upon request, are available at the college:

- automotive technology;
- civil electronics and technology;
- foreign languages;
- high-tech welding;
- high-tech metal cutting;
- IT; and
- refrigeration and air conditioning.

Some short courses have been designed specifically for training existing workers, so the specifications for training required were provided to the college by industry. This is an indication of training appropriateness.

Student satisfaction, which is constantly monitored through surveys, plays an important role in the development and adjustment of courses. To attract additional students, BTL has established links with several universities such as the University of National Economy, Ha Noi Industrial University, University of Electricity, Senior College of Finance and Business Administration, and Senior Teaching College of Ha Noi.

This provides the opportunity to organize the articulation of college qualifications into higher education degrees, so students can transfer from the intermediate vocational training level (college) to a university (within 8 majors/training areas).

Table 1 Number of Students Enrolled at BTL, 2002/2003–2012/2013

	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013
Vocational training	688	1850	2275	2175	2660	3779	4373	4782	4016	2752	1706
Transferring between levels of training (From vocational training to college and/or university)	x	x	x	102	338	753	1111	1433	1646	1879	1536
Short-term training (upon request)	x	x	x	x	500	700	1000	1158	2700	3765	4000

Source Data provided by Bac Thang Long Economic Technical College during the interview, 30 January 2013

BTL also provides the opportunity for students holding vocational certificates at the primary level to study for courses leading to an intermediate level TVET degree⁴ (the process is governed by circular #55 on regulations for articulations). This collaboration attracts additional students to the institution. In the 2012/2013 academic year, 1536 students studied in those programs for level transfers (Table 1).

4.2 Ongoing Review of Courses

Among the college priorities is the ongoing annual review of courses to provide immediate responses to industry requests. For example, in 2012, some companies asked the college to improve studies in commercial trade by emphasizing learning by doing and spending more time on workplace learning. They requested that the college establish a model that combines student study and the practical application of skills, so theory and practice would be closely linked. The college is applying this suggestion in different ways: for a supermarket floor sales position, students learn and practice at the company; for accounting, students learn at the college and go to the company only for work placement. To increase the linkages between the college and industry, BTL asks company representatives to teach at the college. Around 30% of study hours at the college occurs with external support.

To maintain the relevance of its courses, the college collects very detailed information on industry needs. In addition to the surveys, it sends to partner industries, BTL interviews company representatives, holds workshops to clarify their needs, and then adjusts the curriculum to meet these needs. The rector has the authority to implement up to a 30% change within the curriculum framework developed by MOET. This approach of having 30% flexibility in curriculum development provides space for vocational training institutions in Viet Nam to engage in their own decision making about the curriculum. It also applies to institutions regulated by GDVT and MOLISA. As a result, programs and courses have been adapted and developed at BTL based on the needs of enterprises and on Viet Nam's education laws.

4.3 Internal Quality

Ongoing course reviews, as well as short-term labor market forecasting, ensure the external relevance to market needs of the training provided by BTL. Internal quality

⁴After their primary education, vocational training students study for 1.5 years to obtain a college degree (intermediate level); then they enroll in the second year of the university degree and study for 1.5 years to obtain a university degree (called a “college university degree”). This means that after 3 years of study a person with a primary vocational qualification can receive a higher education degree.

is achieved through the organizational structure of the college, approaches to teaching and learning (with a significant component of workplace learning), and quality of teaching staff.

The combination of training at BTL and workplace learning within local enterprises is the key factor that ensures high-quality training by the college. In addition to courses, reviews and workplace learning help ensure the quality and relevance of training. Practice is an important component of the curriculum. Two periods of workplace learning are included in the vocational training programs: 1 month after the first year and 3–4 months after the second year. These workplace learning placements are organized either by industry on the college premises or at the companies' sites. Ninety percent of students are enrolled in the college after high school (they study for 2 years) and 10% after lower secondary school (they study for 3 years). The availability of workplace training is an indicator of labor market relevance. During workplace learning, teachers from the college visit students and write reports on the students' practical experiences, wherein they list the tasks students are performing. The college then sends task lists back to the companies to evaluate and adjust as they see fit. These are then used as inputs in training improvements.

BTL has stated that “industry accepts the quality of [its] students.” Although the college does not conduct tracer studies, it receives feedback from former students. Enterprises also recruit students from year 1 to work on weekends (for example, in restaurants and elsewhere in the hospitality sector).

Companies' involvement in developing training programs as discussed earlier in this case study ensures high-quality training through enterprise surveys commenting on students' skills and future requirements, feedback on students' performance during teachers' visits to workplaces, and participation in workshops that are attended by BTL and enterprise representatives to discuss college training programs.

Funding of the college comes from four main sources:

- 35% is from students' fees (around \$70 per student per year);
- 30% from short courses;
- 5% from sponsorships (for example, by banks, industry); and
- 30% from enterprises for the short-term training of their workers.

Short courses are an important source of income and an effective way to achieve skills development or updates. The college-designed courses are based on signed contracts with a variety of organizations, for example, the Ha Noi Education and Training Department funding of D2 billion–D5 billion (up to \$125,000) to train IT teachers. To overcome supply constraints, such as the inability of TVET providers to respond immediately to rapidly changing demands, the college applied for government funding (through projects) to support its infrastructure upgrading. Through these competitive grants, the government provides incentives to improve the flexibility the responsiveness of vocational training providers.

The college employs both part-time and full-time staff (Table 2) and adopts several measures to ensure the availability and guarantee the quality of teachers' professional development. It plans to engage 23 staff members over 2 years in professional development training to introduce new content identified through industry feedback and companies' needs surveys.

BTL combines both traditional training, such as when training programs are organized by MOET or the Ha Noi Department of Education and Training, wherein the trainer travels to the college, and more innovative training programs that are organized by international organizations. With regard to the latter, recently 10 teachers from Canada came to the college to train students and teachers. In addition, innovative ways and approaches to raising revenues for professional development include company-led training for teachers, the appointment of faculty heads from industry, and the establishment of the Centre for Training and Capacity Building.

BTL invites experts from various companies to work with every faculty member in the college, both at the college itself (the preferred option) and also outside (when related to students' practice placement). Teachers who are managing a group of students at a particular company are trained in the workplace and then evaluated by the company concerned using performance-based criteria. The heads of faculties are industry experts, but this is not true for all teachers working at the college. The Centre for Training and Capacity Building was established in 2012. Staff members from this unit regularly evaluate lesson plans and students' feedback, observe teaching practices, collect students' views, and seek to strengthen and upgrade the pedagogical capacity of College staff. The three main objectives of this unit are:

- Develop plans and implement surveys to evaluate teachers' performance, management quality, and to improve the quality of college human resources;
- Implement partnership projects for capacity building and skills development; and
- Organize a variety of training programs.

This new structure provides the opportunity to monitor and improve teaching and learning quality at BTL. The college also encourages teachers to link formal and nonformal learning, and recognizes the effectiveness of root-based initiatives in relation to professional development (PD).

BTL has a well-developed structure to mobilize its mission, which is to provide quality training programs including professional qualifications in a variety of fields based on frequent renewal of programs; and to ensure that training programs meet the various needs of students and employers. A number of departments support the work of faculties (Fig. 1).

Three centers established at the college also play important roles in supporting teaching, learning, and development. In addition to the Centre for Training and Capacity Building, the Accounting Practical Training and Counselling Centre and the Learning Resources Centre also support the work of the college.

The main purpose of the Accounting Practical Training and Counselling Centre is to

Table 2 Number of full- and part-time teachers employed by BTL

Full-time teachers			Part-time teachers		
Qualifications	No.	(%)	Qualifications	No.	(%)
Ph.D.	2	2.8	Ph.D.	14	5.86
M.A.	29	40.8	M.A.	50	20.90
B.A.	40	56.4	B.A.	175	73.20
Total	71	100.0	Total	239	100.00

Notes Total may not add up due to rounding

B.A. Bachelor of Arts, M.A. Master of Arts, Ph.D. Doctor of Philosophy

Source Data provided by Bac Thang Long Economic Technical College during the interview, 30 January 2013

Fig. 1 Faculties and Departments of BTL.
Source BTL presentation during the interview



- develop programs to monitor, train, evaluate, and improve finance and accounting majors at BTL;
- organize internships and/or practicums for students;
- implement financial and account consultancy services upon request for accredited local enterprises; and
- monitor and evaluate the quality of teaching strategies and staff, as well as the qualifications of students.

The Learning Resources Centre holds multiple copies of more than 3000 books; copies of more than 30 different local magazines and newspapers; and a fully equipped electronic reference archive, including more than 100 reference CDs and tapes.

The close collaboration that occurs among all structural elements ensures the quality of teaching and learning, and students’ and companies’ satisfaction.

The college employs a variety of teaching methods such as student-centered learning, group work, and brainstorming, which are less traditional approaches in

TVET settings. Along with demonstrations and workplace learning, these approaches engage students in integrating theory and practice, with a focus on student-centered learning. Typical features of teaching and learning at the college are a mix of school-based learning; workplace learning; and extracurricular activities such as the managers' club, cultural performance club, sports club, and English club. This combination aims to develop appropriate knowledge, skills, and attitudes among students.

4.4 Challenges Facing TVET in Viet Nam

During the interview, a number of challenges confronting TVET in Viet Nam were identified by college representatives. The main challenge was the difficulty in attracting students. The overwhelming attitude in the country is to enroll at a university even though there may be no opportunity to apply the knowledge and skills gained at the tertiary level. In fact, it is not uncommon for university graduates to end up working as laborers. Universities are the main competitors for TVET, since students do not like the image of TVET, and regard TVET as low status. To overcome this problem, it could help break the TVET stereotype if the name of TVET institutions were changed to "institutes." An additional factor is that the salaries of TVET graduates are comparatively low, which makes TVET programs even less attractive to learners. Students' fees are an important component of the overall budget for many TVET providers, and because the fees are low, there are very limited opportunities for the providers to finance improvement of their infrastructure. As the providers' capacity is limited, the majority of TVET training in Viet Nam is outdated. Additional challenges are encountered due to the separation between MOLISA and MOET, with such management issues causing difficulties for colleges. Another external condition that has a significant impact on the colleges is the speed and direction of Viet Nam's economic development. The TVET system is vulnerable to in-country variations and to any external decline in economic development, such as during the 2008 global economic crisis.

These challenges are well known to BTL. They have been analyzed by the college and addressed through its policies and approaches toward training development and delivery, through articulation processes, through availability of short-term training, and through active positioning in terms of grant searching.

5 Greening Practices

Although the green growth concept is new to the college, it has been adopted in terms of both its social and environmental aspects that are relevant for the greening of TVET.

5.1 *Social*

In terms of the social aspects of green growth, the college has a strong commitment to social justice, paying special attention to providing access to studies for youth from lower socioeconomic backgrounds and in support of the local community. The college's mission statement highlights the objectives of providing educational and career opportunities that accommodate the aspirations and abilities of everyone, particularly youth facing financial hardships.

To achieve this objective, the college helps students to find jobs (85% of students work in local industries and study at the college); and to negotiate with employers (located mainly in the Bac Thang Long Industrial Park) concerning flexible working schedules that allow students to combine work and study. BTL develops flexible timetables for studies, with the same classes being scheduled both in the morning and in the evening. Students are paid around \$150 each per month for their work, and the industry pays a fee directly to the institution of around D3 million (\$150) per month. These guaranteed working places enable students from lower socioeconomic background families to enroll in training, to develop required skills, and to obtain qualifications.

Another approach used by the college to support poor students is through strong links with the local community. Through its targeted support of disadvantaged youth, the college sponsors 30 local students every year to train farmers to be employed in a range of jobs. In addition, college students generally rent accommodation in the local community, which is another means of providing community support.

5.2 *Environmental*

TVET in Viet Nam has sufficient flexibility in curriculum development that serves as an important factor in the greening of its curricula. As industry is becoming greener by responding to environmental regulations and laws,⁵ so TVET providers can respond accordingly with regard to revisions in their curricula. Together with industry's requirements to address environmental legislation, the current attention of MOET to environmental issues is observable in the practices of BTL. These two forces behind such changes provide a good combination of specific and general, practical and more knowledge-based approaches, toward the introduction of green aspects into training.

⁵On 18 March 2013, the prime minister of Viet Nam signed Resolution No 35/NQ-CP on urgent issues in environmental protection that identified tasks to be addressed across different areas, including environmental protection in industry. A Green Industry Policy framework is under development by MoIT with support from UNIDO.

Some elements of greening have been included in the curriculum of several majors taught in the college. Three subjects in the electricity and electronics majors, the first two of which are compulsory for a number of programs, focus on environmental issues. All subjects are very new. This study has noted that TVET providers are very responsive to skills development policies; therefore MOET regulations and curriculum guidelines have the most influence on these green inclusions. Another driving force behind these developments is the Law on Environmental Protection (2005), approved by the National Assembly, which regulates key industries including energy. Article 33 refers to the need to develop clean and renewable energy and provides tax incentives to promote appropriate activities. In 2007, the government set targets to increase the share of renewable energy in total production from 3% in 2010 to 5% in 2020 and to 11% in 2050 (Decision No. 1885/2007/QĐ-TTg). There are also approved targets for wind and biomass renewable energy generation: from 3.5% of total electricity generation in 2010 to 4.5% in 2020 and to 6% in 2030 (Decision N. 1208/QĐ-TTg, 21 July, 2011).

The Programmable Logic Control (PLC) programming subject (automation), whose propose is to implement solutions to energy management and energy savings, was developed to address the regulations of MOET, to demonstrate practical applications of automatic control devices in industrial settings, and to address experts' recommendations at the time when faculty programs were developed. Through this subject, students develop their ability to design automatic control programs using processors that are widely used in industry. They need to learn about different components of processors and the ways they can be linked together to achieve a specified task. The content of the course, which was first offered in 2012, relates to energy saving and environmental protection, with regard to

- programming of automatic lighting control: simple thermostat equipment; automatic on/off control systems based on temperature and humidity;
- programming of automatic power switch systems: electricity, solar energy, and generator; and
- optimizing the use of fuel and raw materials: control concrete mixer models, elevator control models, and control waste treatment systems.

A second subject related to greening is energy efficiency use and energy saving, which aims to help students understand that the natural resources used for energy production are limited, the purpose being to change attitudes away from an excessive use of energy. This subject is based on the curriculum developed by MOET and reflects experts' advice at the stage of subject development. Its rationale relates to the need to save energy, increase energy efficiency, and reduce the costs of production and running a business. The college introduced this subject at the end of 2012. Objectives of the subject are

- to develop attitudes, awareness, and approaches toward using energy efficiently;
- to effectively apply knowledge about energy, forms of energy, mining technology, and energy use to real life situations and industrial production processes;
- to learn how to use energy-saving technology.

Content relevant to energy saving and environmental protection includes

- problems of saving and using energy efficiently in the world and in Viet Nam;
- new technology for energy saving;
- development of processes that save energy in households, agencies, and commercial government premises; and
- planning practices for improving energy use in lighting, refrigeration, and air conditioning equipment.

The third subject, use of renewable energy sources, is an elective of 100 h that was introduced in 2013. It is based on a curriculum developed by MOET from experts' recommendations, and aims to provide knowledge related to limited energy sources and the importance of the use of alternative sources of energy to protect the environment. The subject highlights the practical significance of the use of renewable energy sources to protect the environment and promote sustainable development.

Subject objectives are

- to differentiate renewable and nonrenewable energy sources and the long-term benefits of using renewable energy;
- to examine how to most effectively use energy-saving technologies and renewable energy instead of nonrenewable energy for environmental protection; and
- to develop appropriate attitudes, an awareness of environmental protection, and the priority use of renewable energy sources.

Content relevant to energy saving and environmental protection includes

- the concept of renewable and nonrenewable energies;
- forms of renewable energy (solar, wind, geothermal, wave, biomass, hydro) and nonrenewables (nuclear, coal, oil, gas);
- advantages and disadvantages between renewable and nonrenewable products; and
- a number of scientific and technological advances and practical applications of renewable energy use.

Two subjects relevant to greening are included in the tourism major in the Faculty of Tourism and Trading. Nutrition and food safety provides foundational knowledge on issues such as food safety and approaches to nutrition and food hygiene. Students are engaged in the analysis and evaluation of issues, so they develop an

Table 3 Subjects relevant to greening in the services sector (hospitality)

Number	Subjects	Duration (h)	Description
1.	Environmental protection	30	Provides students with basic knowledge related to the environment, and develops attitudes toward environmental protection in tourism
2.	Nutrition and food safety hygiene	45	Provides students with knowledge related to hygiene and food safety requirements in food processing processes
3.	Arrangements of work in the kitchen and kitchen techniques	45	Provides students with general knowledge about the whole process of labor arrangements; the processing of food and raw material supply in restaurants

Source Data provided by BTL during the interview, 30 January 2013

ability to design a nutritious menu and demonstrate, for example, knowledge of food preservation, and handling.

Another subject in the tourism major is environmental protection. This subject provides foundational knowledge on the environment in terms of habitat; the effect of habitat on human life and other life in the world; the need for environmental protection; analysis, detection, evaluation, and forecasting of environmental issues; and an ability to relate these in learning and to working life. After completion of this course, students are expected to have developed a capacity to improve the environment and prevent the adverse effects of environmental deterioration at their workplaces (be they offices, SMEs, or business establishments). They are taught to deal with issues that are related directly or indirectly to management, evaluation and environmental protection, exploitation and the use of natural resources, and economic activities.

Three relevant courses were introduced in the college 8 years ago in the hospitality major (Table 3). They were environmental protection, nutrition and food safety hygiene, and arrangements of work in the kitchen and kitchen techniques.

Tourism is recognized as an important sector for economic growth; however, it can also be potentially harmful to the environment. The college addresses a number of hospitality-specific green issues in its curriculum.

Future developments for increasing general awareness of environmental protection issues have been promoted by MOET. MOET, through a strategy to respond to climate change, which is supported by the EU, is in the process of introducing a 30-h subject on climate change at all institutions under its supervision. In terms of environmental protection, MOET has developed two separate subjects; one for agriculture (30 h) and another for industry (30 h). After February 2013, these became compulsory for secondary professional schools. There are 650,000 students at the intermediate TVET level who will be affected, and 19,000 teachers are to be trained (interview, MOET).

5.3 *Soft Skills*

Although green soft skills are not currently addressed at BTL, it recognizes the need to pay special attention to attitude development. Various strategies are used by the college to remind students of the need to think about environmental protection and to then act accordingly. On the home page of the college website is a green message encouraging students to save the power consumption of their computers by downloading and using a free software program called Granola.

The website states:

Granola is free software that was launched to help save power consumption when using computers, but does not affect the performance of devices.

This software uses a smart algorithm, combined with power management technology DVFS (dynamic voltage and frequency scaling) to help determine when to use the system at full capacity and when to simply use part of the hardware power. Granola will then automatically take steps to help optimize power savings when using the computer, but still ensures sufficient power supply for computer use when needed.

This is like when you turn off the lights in the house when not in use to save power consumption, but you can still open them when needed.

For light work such as web surfing, text editor Granola will help save up to 30% power consumption compared to conventional. When you use the computer to perform tasks like gaming or heavy graphics processing, the savings will be approximately 10% compared to the previous.

Granola is also used effectively to help extend battery life when using the laptop. (BTL website)

Therefore, the students are encouraged to save energy. It is emphasized that the collective use of appropriate software results in very noticeable savings.

6 Conclusion

BTL is at an exciting stage of its development. The college combines several approaches to identify a demand side for skills, including short-term forecasting and up-to-date regular reviews of the skills required by companies, to plan and adjust training. Although it is training for middle-skilled occupations, it provides opportunities for students to develop their skills further to the level of high-skilled occupations. Mechanisms are in place that could put an additional focus on green skills to enhance their development in the programs. For example, when teachers are developing lists of skills for students to perform during workplace learning, they could identify (together with company representatives) current or potential green components to be included in training. This will potentially lead to a need to buy additional equipment, so the government could develop a grant scheme to support these initiatives by vocational training providers.

Environmental awareness has been included in the BTL curriculum and is recognized as a core skill required for all occupations. A number of developments have been formulated by MOET, and environmental regulations used by industry and the BTL mission, including social responsibility, provide a framework for “greening” the college. Other initiatives have been proposed by staff. The college intends, for example, to import solar panels to support their new environmental courses. Although the process of greening has started successfully by this training provider, environmental awareness has not been included across all courses. Generic green skills have not been formulated at the college or the ministry level, although a generic course on environmental protection will be introduced through MOET. Specific green skills are partly addressed through the health and safety courses. Values and attitudes development, through soft skills modules and extracurricular activities, are present across all countries that have taken part in this research. BTL has not included extracurricular activities that are related to greening (such as ecoclubs, a “green school” approach, or green activities in communities) or soft skills modules, although the college is aware of these possibilities. To support learning in a greener TVET curriculum, a systematic approach to teaching and learning methods that stimulates students’ active learning and initiatives is required.

This case study has showcased the successful and beneficial relationships that can occur among a college, its students, enterprises, and the local community. The close and productive relationship with local enterprises, flexible training models, and meeting the needs of learners and labor market demands are key features of BTL’s experience. The case study is also a good example of the significant, positive impact an institution can make on the development of local communities.

As a result of this case study, the following main points can be viewed as valuable takeaways:

- The government plays an important role in the development of TVET. The majority of providers follow government initiatives in skills development, and so the government needs to continue its direct involvement in training provision to increase its internal quality as well as its external relevance. Mainstreaming green skills in all skills development plans is important to achieve systematic reform.
- The introduction of new green courses should be related to a country’s green development strategies and environmental laws and regulations.
- The content of vocational programs needs to meet the requirements of employers, students, and the wider economy. Currently, TVET does not use industry occupational standards for course development. Industry should be involved in initial curriculum development.
- TVET providers should have adequate freedom for curriculum adjustments that allow them to respond to industry demands regarding the greening of existing skills.
- To meet the requirements of greening strategies adopted by the government, TVET graduates need two sets of green skills: first, occupation-specific; and second, generic, soft skills that are related to building a general awareness of environmental protection.

- Greening should include social and environmental aspects that are closely related to the external efficiency of training.
- Systematic professional development, organized through structures such as the Centre for Training and Capacity Building, could ensure systematic training of staff and pedagogical development in relation to green skills.

TVET providers with good green practices should be identified as key players in consortia development by employers and industry organizations, training providers, and regulatory organizations. Government funding allocated to those consortia that demonstrate best practices in green skills could be scaled up to the sector-specific level of training.

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