

# **Cultivating a "sufficiency" mindset: Thailand's educational strategy for a sustainable society**

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## **ABSTRACT**

Thailand promotes education for sustainable development with a strategy based on the “sufficiency economy philosophy” (SEP) of His Majesty King Bhumibol Adulyadej. Sufficiency-based school programs apply SEP principles as a decision-making framework in their management and learning activities in a “whole-of-school” approach. The aim is to cultivate a “sufficiency mindset” and practices in students’ daily lives by embedding SEP in the curriculum in age-appropriate ways. Sufficiency principles are integrated directly in all subjects and student activities. By April 2016, of the approximately 40,000 schools in Thailand, more than 21,000 had been certified as sufficiency-based. Accredited Sufficiency Educational Learning Centers (SELCs) are mentoring applicant schools to help them become sufficiency-based. By mid-2016, 121 schools had become certified SELCs. A two-phased study investigated the practices and success factors of selected SELCs and the outcomes and their relationship with sufficiency-based schools in the second phase. The SEP-based educational program is aligned with the United Nations Sustainable Development Goal No. 4: Quality of Education, part of 2030 global agenda for sustainability. Challenges are noted that the Thai sufficiency schools movement needs to address to ensure its own sustainability.

**Keywords:** UN Sustainable Development Goals, education, sufficiency economy, schools, Thailand

## **INTRODUCTION**

Educators in Thailand are pioneering curricula and practices aimed at developing their students’ mindset and capacity to adopt sustainable lifestyles. The main strategy is to integrate sufficiency thinking in learning activities that will help cultivate a balanced and resilient outlook. Their broader goal is to contribute to realizing within Thailand the global agenda of sustainable development (Hopwood, Mellor and O'Brien, 2005) as embodied in the 17 Sustainable Development Goals (SDGs) that the United Nations General Assembly adopted in September 2015. SDG 4 concerns equal access to quality education at all levels, so that all youth and a substantial proportion of adults can, by the year 2030, achieve literacy and numeracy and have the knowledge and skills to promote sustainable development.

Sustainable development calls for transformation in mindsets and values, changing how people interact with the environment and society. Education for sustainable development can enable all to learn the knowledge, skills, values, behaviors, and lifestyles necessary to promote sustainability of human life on Earth. It encourages a culture of global citizenship and appreciation of cultural diversity and of the cultural contribution to sustainable development. The aim is to build capacity for

community-based decision-making, environmental stewardship, social tolerance, an adaptable workforce, and improving the quality of life for all, using techniques that promote informed thinking and participatory learning.

A review of five school programs on sustainability in New Zealand, Sweden, and China (Henderson and Tilbury, 2004) has found that “whole-of-school” approaches to sustainability make an important contribution in shifting communities towards sustainability. The review shows that key features of sustainable schools include alignment with national government agendas and sustainable education approaches; access to expertise in sustainable education; significant and on-going funding; investment in professional development of program team members and school partners; establishment of multi-stakeholder partnerships; and linkages with existing sustainable education programs.

A report on the United Nations Decade of Education for Sustainable Development (Wals, 2012) has found key elements of sustainable schools to include integrative, problem-based, and exploratory forms of learning that invite participants to be critical, creative, and change-oriented. Furthermore, schools should implement whole-school approaches with sustainability practices in all aspects of school activities and people’s lives. The report identifies visionary leadership, high levels of participation, social networking, and new forms of action-oriented research as key features of sustainable schools. Despite an increase in research on sustainable schools, research to evaluate their effectiveness is still lacking.

### **Cultivating a sustainability mindset in sufficiency-based schools**

Thailand has made determined efforts to apply the principles of the Sufficiency Economy Philosophy (SEP) of His Majesty King Bhumibol Adulyadej in the national education system. SEP is a decision-making framework that can serve as a guide in living sustainably. SEP consists in the practical application of the three principles of *moderation*, *reasonableness*, and *prudence*, conditioned by *knowledge* and *virtues* (Wibulswasdi, Dharmapiya and Pootrakool, 2008). The process leads to appropriate ways to solve problems or take action in different situations. SEP stresses balance in the use of material (economic), social, environmental, and cultural capital, while underlining the importance of resilience in dealing with changes in these four all-embracing dimensions of life. Progress with balance and resilience promotes stability and, ultimately, provides a basis for sustainability.

The integration of SEP in the educational sector in Thailand aims to encourage a sustainability mindset and practices as a basis for national sustainable development. SEP school programs began in 2008 with a curriculum to instill sufficiency principles in students’ daily lives. However, classroom teaching alone was insufficient to change mindset and behavior, so a whole-school approach was developed to apply sufficiency thinking in all school practices, including management, extracurricular student activities and teacher development. Sufficiency-based schools seek to train students to form lifelong habits through their “head, heart, and hands”—the intellectual, spiritual, and practical aspects of education. Students are encouraged to develop a sufficiency perspective for living self-reliant and balanced lives, starting from applying sufficiency principles in decision-making that support sustainability.

Two levels of school certification for sufficiency-based schools have been established by the Ministry of Education. The first certification level for sufficiency-based schools concerns a SEP curriculum and a whole-school approach. By April 2016, of the approximately 40,000 schools in Thailand, nearly 21,000 had been certified as having successfully integrated SEP as a practical orientation in all aspects of school activities and daily lives. The second type of school certification in SEP is the Sufficiency Education Learning Center (SELC) for schools that can offer advice, mentoring, and supervision to other schools that aim to become sufficiency-accredited. By mid-2016, there were 121 accredited SELCs.

In addition to the two formal certification levels, Sufficiency School Center under the Foundation of Virtuous Youth develop the “best-practice” status that serves to help sufficiency-based schools at the initial certification level to improve their quality of learning activities and management. Sufficiency-based schools with best practices numbered 165 as of June 2016. The selection criteria of the best-practice school activity are clear implementation of SEP demonstrating innovation and quality performance, as well as inspiring motivation in students. Those selected for the best-practice status receive opportunities for participation in various SELC programs and training.

### **The sufficiency-based curriculum**

The current curriculum has been designed to enable students to embrace SEP in everyday life so that they can develop a practical set of virtues (moral, ethical values, including discipline and some form of religious practice) that promotes sustainability. SEP is integrated into standards-based academic subjects. The emphasis at each grade level is outlined here below.

Primary School: household and school frames of reference

- G1: learning to save; sharing with family and friends; learning to be self-reliant in daily life
- G2: family spending analysis; moderate spending.
- G3: helpful; in-kind sharing and generosity
- G4: household accounting; practice of SEP-based cooperative behaviors
- G5: SEP applications in a school cooperative system
- G6: school situation analysis based on SEP; participation in SEP-based school activities

Secondary School: community, provincial, and global frames of reference

- G7: survey of community history and current problems; analysis of community status and social capital based on SEP framework
- G8: applying cooperation in daily life; stories of SEP-based cooperative activities in local community; SEP community case study
- G9: SEP application in community development
- G10: background of SEP concepts and royal speeches about SEP
- G11: understanding and applying SEP in national economic and social development
- G12: application of SEP in understanding global development

Teachers use several techniques to integrate SEP into learning activities and generate environments conducive to creating sufficiency-oriented mindsets. The most popular method is Question, Plan, Action, and Reflection: the “QPAR model”. It is a cycle of learning, requiring head-heart-hand-related activities for balanced learning experiences, such as assignments, outdoor activities, real-life projects or lab tests.

**Questions:** Students ask questions among themselves within the framework of SEP when designing and implementing learning activities, as follows:

- What are we attempting to do?
- Why are we doing this?
- What will be the results if we do this?
- What fundamental ethics can lead to success?
- Are we ready to do this?
- Do we have enough knowledge to do the work successfully?
- If not, what type of knowledge do we still need? How can we learn it?
- How, when, and with whom would it be appropriate to do this?
- What is the sequence of actions?
- Are there risks and obstacles? How can we mitigate or prevent them?
- How can we utilize the material (economic), social, environmental, and cultural capital in a balanced and resilient manner?

**Plan:** Students then plan together, based on what they have learned from prior questions and answers, learning how to assess and choose among different work plans and sequences before acting.

**Action:** Students use sufficiency principles in acting with caution, mindfulness, diligence, and perseverance, among others. Sufficiency-based learning results from real experiences and practices.

**Reflection:** After lessons or activities, students evaluate the project through the SEP framework, reflecting on what they have learned or what they hadn't understood. This analytical process is important in nurturing a sufficiency mindset through evaluating benefits and values of the SEP.

The implementation process of the learning activities must be moderate, as well as suit students' capabilities and the school environment. Projects are assessed on criteria such as whether students have applied knowledge reasonably, based on morality, with prudence and carefulness; the extent of self-reliance; and how the school and community benefits from the project. Also, SEP-related projects must demonstrably fit the location and local culture, be well planned, include risk assessment, and involve a learning process that develops morality and life skills.

A sufficiency-based curriculum is necessary, but in itself is not sufficient to cultivate suitable mindsets and behaviors. A whole-school approach is needed, comprising school activities, an enabling environment, a suitable school culture, and role models.

### **Sufficiency-based school activities**

Four categories of sufficiency-based school activities emphasize balanced development among the four dimensions, here seen as economic activities, social activities, the environment, and culture.

1. **“Save & Safe”** economic activities are designed to train students to handle money and material resources in a prudent, moderate, realistic manner that allows for unexpected events. They include:
  - Keeping an income-expenditure balance sheet
  - Practicing moderate use of resources such as water, electricity, and fuel
  - Practicing saving through cooperative and saving group initiatives in school
  - Practicing food self-sufficiency in school, involving school lunch programs and integrated farming, extending to households and community.
2. **“Caring & Sharing”** team-related (social) activities prepare students to be good citizens, be civic-minded, and value the public interest beyond self-interest. Activities focus on cooperation, rather than self-centered narrowmindedness. Teamwork activities and community development are the main ways of practicing necessary social skills such as responsibility, discipline, lawful behavior, and social ethics such as sharing, generosity, and honesty. They include:
  - Moral development programs: Buddhist chanting, meditation, observing the Buddhist behavioral precepts, listening to dharma talks, and other religious activities
  - School and community development work: daily school cleaning, community “big cleaning” day, and volunteer assistance to senior citizens in the community
  - Taking pride in national, historic, and religious sites, including participation in conservation and renovation work.
3. **“Clean & Green”** environmental conservation activities enable students to learn to value natural resources such as soil, water, forest, air and renewable energy, while cooperating in team activities to preserve the environment and reduce unnecessary consumption of resources. Activities involve studying royal development projects and community's initiatives intended to solve local problems. They include:
  - “3Rs” (reduce, reuse, recycle) within the school and community
  - Promotion of environmentally friendly knowledge management
  - Learning from royal development works in environmental conservation and restoration, such as tree planting, dam building, and soil stabilization.

4. “**Community & Culture**” activities take place mostly outside school through connections with community and local cultural centers. Students learn about local and national values, and wisdom inherited over the generations. They cultivate pride in their nation, understanding who they are, and where their roots and communities are and come from, while participating in conserving and preserving cultural heritage. They include:
- Understanding applications of local wisdom, while developing pride in local traditions
  - Learning about Thailand’s cultural legacy, Thai and local culture and etiquette, and ancient site conservation, among other aspects
  - Respecting different cultures and practicing living in harmony in a culturally diverse society.

After eight years of integrating sufficiency into national basic curriculum and developing sufficiency-based schools in Thailand, there was a need to examine the practices used in their implementation, their outcomes and the critical factors that were driving success at these schools. In 2014, another study was launched to examine the outcomes of sufficiency-based school practices in comparison with those ordinary schools.

## **RESEARCH METHODS**

Research was conducted in two phases. In the first, qualitative case studies investigated the experience of nine SELCs in facilitating SEP in education. The selected SELCs provided a range in subject composition regarding school type and size, rural/urban residence, (Buddhist/Christian/Muslim) religion, Thai or other ethnicity, and wealth. Data sources included existing documentation, school visits, school meeting observations, and interviews with school leaders, administrators, teachers, students, and community members. Document analysis included school reports, school training and development documents, school quality assessment reports, school project reports and documents, school curricula, and lesson plans.

In the second phase, surveys of 178 schools were conducted to evaluate the extent of practical factors identified in Phase 1 and, importantly, the outcomes. The relationships of school practices and each dimension of outcomes were also tested. Outcomes of students in grades 6, 9 and 12 in different categories of sufficiency-based schools (the initial level of SEP schools, the second level of “best practice” schools, and the highest level of SELCs) were studied. Stratified random sampling was used. Responses from 40 schools in the first-level category were received. The second-level category had responses from 42 schools. A total of 63 SELCs responded to the questionnaires. Responses from 33 other non-SEP-accredited schools were also received. The context of participating schools was also checked to ensure comparability among the various categories. The survey was sent to the school management, change-agent, teachers, students, and community representatives. The study also collected data on student scores on the universal Ordinary National Educational Test (O-NET).

## **RESEARCH RESULTS**

### **Phase 1: Qualitative findings**

**Key practices.** The following five practices were found in the development of SELCs:

1. **Readiness preparation** systematically integrates SEP into whole-school activities, including preparation of staff for effective cooperation in the establishment process. Readiness consists of five elements:
  - a. Readiness of school management to lead the SEP movement
  - b. Readiness of teachers to understand the concept of SEP, apply sufficiency principles in their classroom lessons, practice them in their daily lives, and share their knowledge
  - c. Assistance for students in learning according to their abilities, including improving physical health through school lunch programs; providing transport for needy students to attend school; careful responses to mental health problems, misbehavior, family difficulties, lack of concentration; and providing peer tutoring for slower learners

- d. Partnership among parents, the local community, and the SELC, which requires a continuous process to create understanding within the community
  - e. Improvement in the school's physical environment that enhances the learning process.
2. A **sufficiency-based curriculum** includes integrative, comprehensive teaching about SEP at every level and in all subjects. Numerous extracurricular activities enable students to integrate SEP into their daily activities.
  3. A **wide variety of school activities** promotes habits of sufficiency that carry over between school and home. Activities include group activities that encourage discipline, harmony, volunteering, public-spiritedness, and mutual help in learning. They cover four categories in a balanced way, as discussed above: material (economic), social, environmental, and cultural. Senior staff train, coach, and inspire new teachers in understanding SEP correctly. Staff development programs in SEP are ongoing; inquiry, sharing, and learning are encouraged. Many activities foster relationships with the local community. Parents and others regularly volunteer for activities like co-op saving, recycling, teaching local wisdom, and improving school facilities. In return, school administrators, teachers, and students participate in community environmental conservation and cultural events.
  4. **Changes in schools as outcomes** of applying the sufficiency approach is expected as part of the discipline. At the individual level, it develops mental and spiritual resilience. Teachers and students with a sufficiency mindset habitually contemplate the principles in their everyday activities. At the organizational level, caring and sharing are core virtues. Caring for limited resources and the environment results in moderate consumption, while caring for others gives rise to sharing and serving. In general, the SELC process aims to produce civic-minded citizens including principals who run their schools on sufficiency fundamentals, teachers with sufficiency values and attitudes, and students whose values and behaviors reflect a sufficiency mindset.
  5. **SEP program expansion** to other schools, authorities, and communities hinges on SELCs that act as learning hubs for expanding the sufficiency-based school system. Various organizations including Foundation of Virtuous Youth assist and support SELCs with staff development and student training to explain, coach, and mentor others.

**Key success factors.** Three *internal success factors* with eight sub-features are indicated here below in brackets:

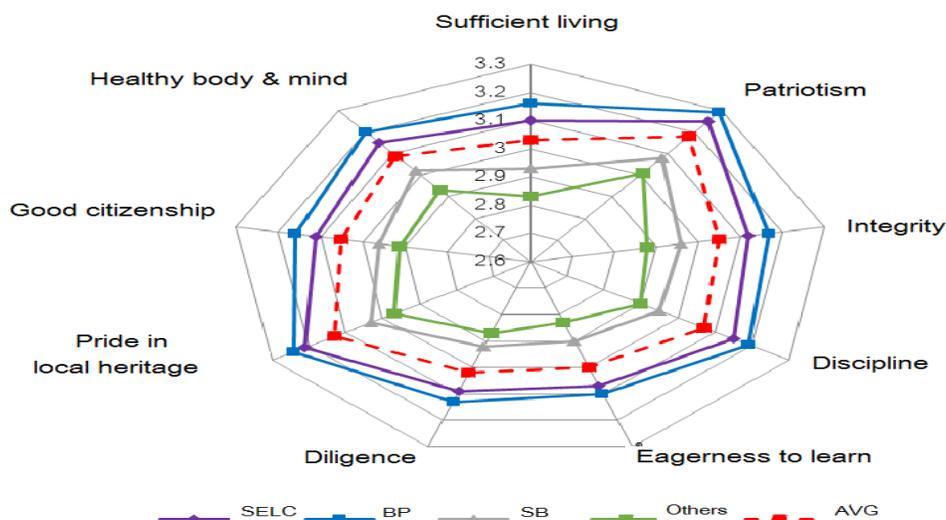
- (1) **Inspiration**, consisting of (1.1) loyalty to the King and (1.2) faith in sufficiency principles. Thailand's monarchy inspires devotion to work for the nation and society. Thais feel gratitude towards their working royals that translates into loyalty, which is an integral part of Thai culture.
- (2) A shared **personal character set** comprising (2.1) accurate understanding of SEP and the ability to apply it suitably and appropriately in changing conditions; (2.2) basic virtues of perseverance, patience, and persistence; and (2.3) attitudes of benevolence, sharing, and public-mindedness.
- (3) An **enabling environment** includes (3.1) a harmonious school atmosphere, manifested in a shared vision and ideology among the main stakeholders; (3.2) an inclusive ethic of having stakeholders participate in driving the sufficiency-based school, using role models; and (3.3) a physical environment that enables behavior to develop through practice.

Three key *external elements* are found to contribute to success in cultivating sufficiency mindsets. They are: (a) professional development for teachers and others, and policy support from the Ministry of Education; (b) a network of like-minded friends, a community of practitioners; and (c) socio-cultural and religious factors based on local learning centers and acceptance of socio-cultural and religious diversity.

## Phase 2: Survey findings

The second-phase findings focus on the extent of the five key practices. They also reveal three outcomes: desired student character sets, key competencies, and O-NET scores. Changes to school personnel and the community were also assessed.

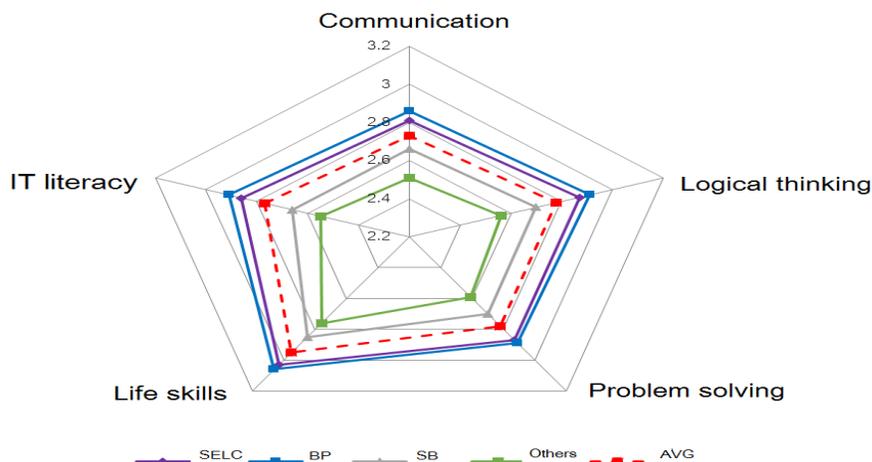
**Desired student character traits.** Figure 1 shows that sufficiency-based school students had a higher level of proficiency than students in other schools in all nine student character traits (sufficient living, good citizenship, eagerness to learn, integrity, diligence, discipline, healthy body and mind, pride in local heritage, and patriotism). The innermost line in figure 1 belongs to ordinary schools without SEP-accreditation. The character feature with the highest average score from sufficiency-based school learners is patriotism.



**Figure 1.** Average desired-character scores of all students

Notes: SELCs = Sufficiency Educational Learning Centres  
 SB = highest category of sufficiency-based school  
 BP = "Best Practice" or second category of sufficiency-based school

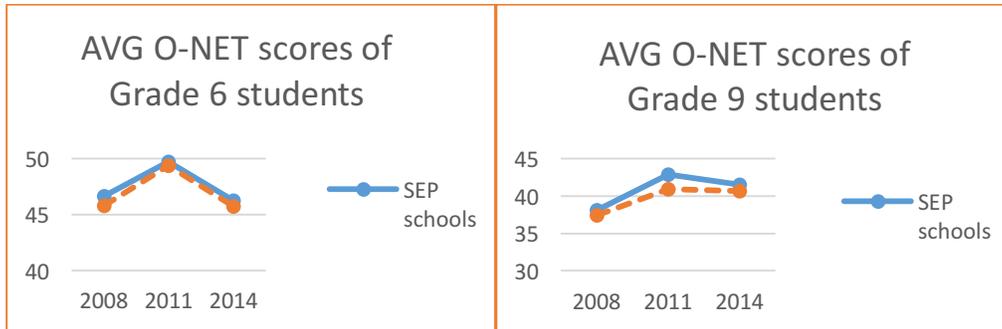
**Student competencies.** Sufficiency-based school students had a higher level of proficiency than students in other schools in all five competencies: (life skills, communication, logical thinking, problem solving, and information technology (IT) literacy). The competency with the highest averaged score from sufficiency-based school learners was life skills. The competency results are shown in figure 2.



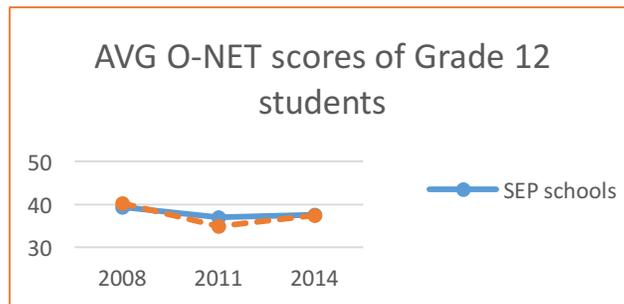
**Figure 2. Averaged competency scores of students**

Students in Grades 6, 9 and 12 of the Best Practice category and SELCs showed higher levels of proficiency in all five competencies than students in equivalent grades at other schools. However, students in Grade 12 in the first-level of sufficiency-based schools had a lower level of proficiency in all five competencies than students in other schools.

**Student national O-NET results.** The findings revealed higher average O-NET scores among students from sufficiency schools than the average national standard in 2008 (excepting Grade 12 student scores), 2011 and 2014. The results are shown in figures 3 and 4.



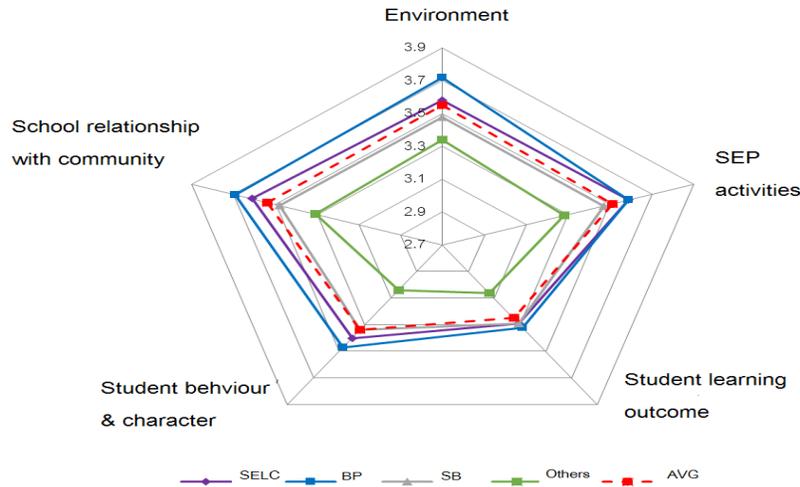
**Figure 3. Averaged O-NET scores of Grades 6 and 9 students in 2008, 2011 and 2014**



**Figure 4. Averaged O-NET scores of Grade 12 students in 2008, 2011 and 2014**

In screening by O-NET results at three-year intervals across categories of sufficiency-based schools (SB, the basic level), best-practice schools (BP, the second category), and SELCs in comparison with non-SEP-certified schools, variations in results were seen to exist. Some sufficiency-based school categories scored better and some categories scored worse than did other schools. There was also variation in results across the three years. However, SELCs results tended to fluctuate less sharply across the three years.

**Community satisfaction.** Local communities with sufficiency-based schools showed a higher level of satisfaction than did other communities, as reflected in figure 5. The innermost line belongs to other schools.



**Figure 5.** Averaged scores of community satisfaction

**Extent of school practices.** Sufficiency-based schools demonstrated effectiveness of their SEP practices in the 5 dimensions of school management, curriculum, learner development activities, staff development, and networking to expand results, as shown in Table 1. SELCs and best-practice schools received very high scores in all 5 dimensions, while sufficiency-based schools gained very high scores in 4 dimensions, those excepting curriculum. Other schools received very high scores in only 3 dimensions, that is, except in the dimensions of curriculum and networking to expand results.

**Table 1** Extent of school practices

Type	Practice	N	Min	Max	Mean	Level	SD	C.V.
<b>SELCs</b>	School Management	63	3.33	4.00	3.93	very high	0.10	2.54
	Curriculum	63	2.73	4.00	3.67	very high	0.22	5.99
	Learner development activities	63	3.42	4.00	3.94	very high	0.11	2.79
	Staff development	63	3.55	4.00	3.98	very high	0.07	1.76
	Network expansion	63	3.66	4.00	3.96	very high	0.08	2.02
	<b>Average total</b>	<b>63</b>	<b>3.59</b>	<b>4.00</b>	<b>3.89</b>	<b>very high</b>	<b>0.08</b>	<b>2.06</b>
<b>Best practice schools</b>	School Management	42	3.54	4.00	3.91	very high	0.10	2.56
	Curriculum	42	2.57	4.00	3.59	very high	0.28	7.80
	Learner development activities	42	3.52	4.00	3.88	very high	0.15	3.87
	Staff development	42	3.53	4.00	3.95	very high	0.11	2.78
	Network expansion	42	3.08	4.00	3.88	very high	0.19	4.90
	<b>Average total</b>	<b>42</b>	<b>3.33</b>	<b>4.00</b>	<b>3.84</b>	<b>very high</b>	<b>0.14</b>	<b>3.65</b>
<b>First level sufficiency-based schools</b>	School Management	40	3.04	4.00	3.79	very high	0.20	5.28
	Curriculum	40	2.25	3.70	3.31	high	0.33	9.97
	Learner development activities	40	3.34	4.00	3.81	very high	0.19	4.99
	Staff development	40	3.34	4.00	3.90	very high	0.16	4.10
	Network expansion	40	2.32	4.00	3.56	very high	0.43	12.08
	<b>Average total</b>	<b>40</b>	<b>3.07</b>	<b>3.91</b>	<b>3.68</b>	<b>very high</b>	<b>0.21</b>	<b>5.71</b>
<b>Others</b>	School Management	33	2.82	3.99	3.58	very high	0.30	8.38
	Curriculum	33	2.14	5.58	2.97	high	0.66	22.22

	Learner development activities	33	2.67	4.00	3.61	very high	0.35	9.70
	Staff development	33	2.82	4.00	3.77	very high	0.29	7.69
	Network expansion	33	1.58	4.00	3.13	high	0.63	20.13
	<b>Average total</b>	<b>33</b>	<b>2.45</b>	<b>4.14</b>	<b>3.41</b>	<b>high</b>	<b>0.39</b>	<b>11.44</b>

**Outcome correlation.** Table 2 shows the relationships of school practice variables and each element of outcome. The curriculum and learner development activity factors taken together explain 53.5% of the variance of difference of O-NET scores in 2011 and 2014 of Grade 12 students. The curriculum factor can predict 21.3% of the variance of O-NET scores for Grade 9 students.

School management and network expansion factors can collectively explain 26.2% of the variance of community satisfaction.

The staff development and curriculum factors taken together explain 14.1% of the variance of desired character level of Grade 12 students. The staff development factor can predict 11.9% of the variance of key competency level of Grade 12 students.

In addition, *learner development activity* has predictive power over key competencies and desired characters of Grade 6 students, and changes in community members. *Network expansion* is related to key competencies and desired characters of Grade 9 students and community satisfaction.

**Table 2** Correlation between sufficiency-based school practices and outcomes

Outcome variables		Stepwise				
		Antecedents	R	R <sup>2</sup>	F	Sig
<b>1 Student outcomes:</b>						
1.1 Difference of O-NET score in 2011 & 2014						
	Grade 9	Curriculum	0.462	0.213	8.671*	0.006
	Grade 12	Curriculum	0.542	0.294	7.483*	0.140
		Learner development activity	0.731	0.535	9.771*	0.001
1.2 Key competencies						
	Grade 6	Learner development activity	0.250	0.062	5.988*	0.016
	Grade 9	Network expansion	0.228	0.052	5.103*	0.026
	Grade 12	Staff development	0.345	0.119	7.985*	0.006
1.3 Character indicators						
	Grade 6	Learner development activity	0.301	0.090	*8.939	0.004
	Grade 9	Network expansion	0.300	0.090	*9.201	0.003
	Grade 12	Staff development	0.375	0.141	9.651*	0.003
		Curriculum	0.444	0.194	7.136*	0.002
<b>2. Changes in school personnel</b>		Curriculum	0.237	0.056	8.546*	0.004
<b>3. Changes in community</b>						
3.1 Changes in community members		Learner development activity	0.311	0.097	15.325*	0.000
3.2 Community satisfaction		Network expansion	0.474	0.224	41.366*	0.000
		School management	0.512	0.262	25.239*	0.000

## DISCUSSION

Five key SELC practices emerge from the first phase of the study:

- readiness preparation and school management of sufficiency learning
- sufficiency-based curriculum and learning system
- wide-ranging school activities
- encouraging sufficiency habits in individuals and the community
- sufficiency-based program expansion to other schools and communities

Furthermore, eight key factors in the success of SELCs include:

- faith in sufficiency principles
- shared personal characters based on SEP
- professional development of staff
- expertise in education for sustainability
- a curriculum committed to sustainability
- an enabling environment
- effective multi-stakeholder partnerships
- a focus on social, cultural, and environmental dimensions

The success of the sufficiency-based school focus on social and cultural dimensions of sustainability rather than simply on a “green” agenda accords with findings from the study of sustainable schools in New Zealand, Sweden, and China (Henderson and Tilbury, 2004) and a report from a governmental sustainable school framework in Britain (Scott, 2009).

The Thai findings here also accord with the success factors identified by Henderson and Tilbury (2004) such as expertise in education for sustainability; professional staff development; curricula committed to sustainability; effective multi-stakeholder partnerships; and political support.

In addition, many key elements of the first-phase findings are aligned with the findings of the Wals report on the UN Decade of Education for Sustainable Development (2012), the Henderson and Tilbury international study (2004) and a report from Britain (Scott, 2009). They identify visionary leadership, social networking, new forms of inquiry, and high levels of participation as key elements in sustainable school approaches. School leaders need to encourage involvement and consensual decision-making. Similarly, the United Nations report concludes that sustainable education requires integrative, problem-based, and exploratory forms of learning that invite participants to be critical, creative, and change-oriented. The school can be a “*learning organization*” that provides for participatory learning approaches for students, reflective practice for teachers and regular professional development for all participants. Furthermore, sustainable schools require whole-of-school approaches, synchronizing learning with school operations and emphasizing the active engagement of multiple actors.

The results from the second phase of the study provide strong evidence for higher levels of key competencies and desired characters in sufficiency-based school students and community satisfaction, in comparison with results from other schools. This finding from Thailand supports the finding from the Henderson and Tilbury review of international sustainable school programs (2004) that whole-school approaches to sustainability make an important contribution in shifting communities towards sustainability. The finding on the overview of academic O-NET results of Thai sufficiency-based school students provides fair evidence of higher results than those of non-SEP-based-school students. Such evidence is not as strong, however, as that for the other three outcomes (student characters, student competencies, and community satisfaction).

Furthermore, clear evidence exists for a higher extent of the five practice dimensions in sufficiency-based schools than in other schools. Other schools received very high scores in only three dimensions (those excepting the two dimensions of curriculum and networking to expand results). Regarding the latter two dimensions, the study also found that the *curriculum* variable, together with learner activity development, predicted 53.5% of the variance of O-NET scores of Grade 12 students. The curriculum factor alone can predict 21.3% of the variance of O-NET scores for Grade 9 students. In addition,

curriculum taken together with staff development can explain 14.1% of the variance of desired character level of Grade 12 students. *Network expansion* is found related to key competencies and desired characters of Grade 9 students. Together with the school management variable, network expansion can explain 26.2% of the variance of community satisfaction. Therefore, in order to positively impact their outcomes, other schools should improve in terms of curriculum and network expansion.

## CHALLENGES

Challenges for the future of the sufficiency movement in Thai schools abound. Three key challenges are discussed here.

Firstly, maintaining sufficiency practices in schools is impacted by the policy of the Ministry of Education to rotate school heads every four years across schools. Incoming headmasters often choose to implement new initiatives rather than continue the sufficiency approach. Consequently, there is some risk whether the sufficiency movement in each school will continue.

Secondly, there are challenges in persuading other schools to join the sufficiency movement. Existing sufficiency-based schools are involved because of their inside-out desire for change, coupled with hearing about effective outcomes spread by word-of-mouth from pioneer sufficiency schools. Resistance from teachers is a major issue, but their support is essential for strengthening the sufficiency-based school sustainability and expansion.

Thirdly, when students finish school and enter the wider society, their new situations might not be compatible with SEP thinking and they might not easily sustain their SEP mindset and practices. A decade of political turmoil has slowed the development of sustainability in Thailand, which requires participation from many sectors of the society, including media, in addition to education.

In terms of diffusion SEP across countries, SEP shares many similarities with the main concepts of other international education for sustainable development approaches, including focusing on balanced development between physical, environmental, and social matters. SEP is also in line with international character building methods such as learning-by-doing, learning through reflection, self-discovery (rather than memorization), and developing 21st century skills. Developing sufficiency mindset and practices in schools and communities clearly supports the UNESCO vision of “Education for Sustainable Development.” (UNESCO, 2007).

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