

Student-led environmental management system in Chiba University

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Abstract

Purpose – This paper aims to explain the student-led environmental management system (EMS) based on ISO14001 which Chiba University has continued for 15 years. It describes its structure “Chiba University Method”, the students’ activities and their collaboration with companies. It also analyzes the advantages and the issues. Readers can reconsider these mechanisms and results to examine whether they could introduce the student-led EMS in their own university.

Design/methodology/approach – Four critical points are explained concerning the “Chiba University Method”. The advantages are analyzed by the data and the questionnaire survey.

Findings – It has been found that student-led EMS has an effect of practical education on the students and an improvement of social evaluation on the university, as well as a reduction of environmental burdens. For students, in addition to the direct merit of obtaining credits, they receive a sense of accomplishment through gaining practical experience, thereby realizing improvements in business skills and making friends through activities. These are good incentives to participating in various activities. However, there are also problems that occur due to student-led EMS, and it is necessary for faculties to be aware and correspond with them.

Research limitations/implications – This paper is based on the experience of one Japanese University.

Social implications – As this case falls under the practical case of active learning, it is expected that other universities could also introduce this system.

Originality/value – It is rare that the students manage the EMS based on ISO14001 with educational effects included in the results. At Chiba University, moreover, students are making environmental contributions to local communities through collaboration with companies.

Keywords Active learning, ISO14001, Student, Environmental management system, Chiba University, Practical education

Paper type Case study

1. Introduction

Chiba University (www.chiba-u.ac.jp/e/) is the only university in Japan that has acquired both ISO14001 (in 2005) and ISO50001 (in 2013). Since 2003, the Student Committee for Environmental Management Systems (“the Student Committee”) has been in charge of constructing and controlling the environmental management systems (EMS) and Energy Management Systems in the University. Moreover, as the university has been using student-led EMS for a long time, it has won various awards both in Japan and abroad in recent years.



The Student Committee was awarded the “The Grand Prize for the Global Environment Award/Minister of Education, Culture, Sports, Science and Technology’s Award” in 2015 and received the “Minister of the Environment’s 2017 Commendation for Global Warming Prevention Activity” in 2017. These are both major important environmental awards in Japan. Also, Chiba University received the Excellence in Student Leadership Category Awards in 2017 of the “Sustainable Campus Excellence Awards” given to a sustainable campus project sponsored by ISCN (The International Sustainable Campus Network), a global university network aiming to build a sustainable campus. It was also awarded Student Engagement Category Awards in 2018 at the “International Green Gown Awards 2017-2018” which is a worldwide award system that recognizes exceptional sustainability initiatives being undertaken by universities and colleges, which is operated by EAUC (The Environmental Association for Universities and Colleges).

In this paper, the following contents are explained using the model of Chiba University. The first is the structure of the student-led EMS. Among them, there is a history of acquiring ISO14001, the system called “Chiba University Method,” the activities of students, and the community contribution activities through collaboration with companies. On that basis, it analyzes the concept “Why has Chiba University student-led EMS based on ISO1400 continued for as long as 15 years?” and “Why do many students participate in the Student Committee every year?” Next, it compares and verifies the challenges faced by universities that have acquired ISO 14001 in Japan and the case of Chiba University. Finally, it summarizes the social significance of this case study. Among internationally published papers, there are case studies of South Valley University (Mohamed, 2015) and Shenyang University (Geng *et al.*, 2013) that refer to ISO14001 regarding their university’s environmental efforts. However, there are no case studies about the universities that operate student-led EMS or successful cases from Japanese universities. As for student participation in sustainability education, according to Butt *et al.*, 2014 (p.802), which surveyed Australian universities, it is “while the participating universities provide opportunities for students to engage in sustainability programmes, including through formal decision-making structures, the level of overall student participation is currently very low” and concludes “while the commitment of staff rather than that of students is currently the key ‘people’ driver of these sustainability programmes, universities could better leverage the capacity of their student bodies to enhance their understanding of student attitudes”. Chiba University clearly states “Student-centered creation and operation of the EMS” in its environmental policy. In addition, 1 per cent of all students participate in the EMS program, and they constitute the student committee. Also, Mcmillin and Dyball, 2009 (p.56) point out that “Sustainability education in most universities is generally confined to specific courses, education is not necessarily linked to research, and both education and research are separate from campus operations”, it is important to link education, research, and campus management, and to have students participate in each. Chiba University implements EMS, which is a part of university management, as a part of education. Moreover, although it is described as thus:

[. . .] by encouraging a collaborative space within the curriculum for students, academics and managers to critically reflect on university performance with regard to sustainability, many positive benefits can ensue including improvement in campus environmental performance and building the capacity of students to become agents of change (p. 63).

Chiba University has placed the student committee in a part of the university organization, and it makes the students participate in the EMS planning meeting and reflects their opinion. Thus, it can be said that the case of Chiba University is one of the answers to the point mentioned in the previous research.

2. The mechanism of the student-led environmental management system

This chapter explains the structure and content of the student-led EMS that Chiba University has conducted. At first, it describes the outline of the University and the history of acquiring ISO14001. After that, it explains “Chiba University Method”. Finally it describes collaboration between students and companies.

2.1 Overview of Chiba University and process of ISO14001 acquisition

This section explains the composition and scale of Chiba University and circumstances of ISO14001 acquisition.

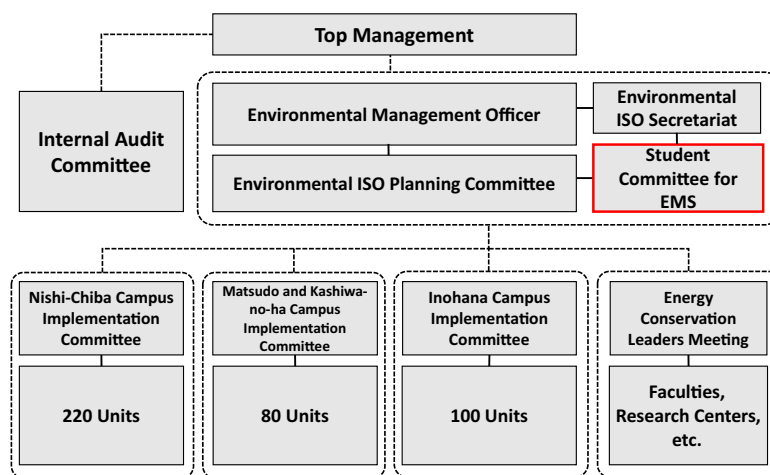
Chiba University was established in 1949 and incorporated in 2004. Currently, having around 15,000 students and 3,000 faculty staff, it is one of the leading comprehensive universities in Japan. The university exists in Chiba Prefecture located next to the capital city Tokyo. There are four campuses. It has ten faculties and 13 graduate schools. Moreover, there is an ancillary hospital, kindergarten, elementary and junior high school, a school for students with special needs, and research centers.

Chiba University made a declaration of the President to embark on ISO14001 acquisition in October 2003, raising four points of significance to acquire it. The first was a social responsibility as a large-scale business facility to tackle the problem of environmental load reduction, the second was an effective use of expenses, the third was the attitude to tackle environmental management as a public educational institution, and the last was to show the innovative spirit of acquiring ISO by the student-led EMS. At the same time as the declaration, the “Student Committee for EMS” was established. Students were responsible for various tasks related to ISO acquisition, and Chiba University acquired ISO14001 in 2005. Moreover, it acquired ISO50001 a first for a Japanese university, in December 2013.

2.2 Chiba University method

“Chiba University Method” is the mechanism that supports Chiba University’s “student-led EMS”. In this section the four critical points of the method will be explained. First, Chiba University has established the Student Committee as one of the university’s organizations. Second, students are engaged in activities related to the core operations of EMS and various environmental activities. Third point is accreditation and qualification system. Students can earn credits and a qualification by conducting the Student Committee activities. Finally, the Student Committee was recognized as the nonprofit organization (NPO) and activated activities outside the campus. The above four points are explained in detail below.

2.2.1 Student committee was established as one of the university’s organizations. The first point of the Method is that the Student Committee is set within the organization of the university. It is not a student club but is incorporated into the EMS operation framework (Figure 1). In this framework, under the “Top Management” consisting of the president and directors, there are “Environmental Management Officers” and “Environmental ISO Planning Committee” (the Planning Committee), which are the core of the EMS operational decision-making body. “The Environmental ISO Secretariat” is responsible for the administration of the EMS operations. “The Student Committee for EMS” performs the duties of the Secretariat as a “practicum” and also submits proposals and activity reports to the Planning Committee. Under the Planning Committee are “Environmental ISO Implementation Committees” for each campus, which are the forums where decisions are relayed to each campus. “Units” are considered the minimum units that are the most efficient for environmental management such as research labs. “The Energy Conservation Leaders Meeting” is a meeting to improve energy performance. “The Internal Audit Committee” serves as an organization to conduct internal audits of the EMS. A member of



Source: Created by the author

Figure 1. Organizational chart for environment management operations at Chiba University

the faculty staff helms the Supervisor role but the auditors also include some members of the Student Committee.

2.2.2 Students undertake core operations related to environmental management system.

The second point of the Method is the contents of student activities. The Student Committee has more than 150 students every year. This is 1 per cent of all students. They take responsibility for operations relating to the core PDCA (Plan-Do-Check-Act) cycle of the EMS as part of their practical education.

At the PLAN section, students create a draft proposal for the “Action Plan for Achieving Targets” for the entire university and then submit it to the Planning Committee. At the DO section, all students and faculty staff receive training on EMS and environmental awareness (called “basic training”) at student orientations and Professor meetings at the beginning of each year. The Student Committee serves as instructors for this training. Moreover, as a unit to execute the Action Plan, the students are divided into about 20 groups and practice various activities. As an “Ecological awareness raising activity,” the students create posters and stickers and hold eco events for example energy saving or trash separation. As a “Reuse/Recycle activity,” they make compost from fallen leaves in the university, and hold sales events of used books and used bicycles. As an “Environmental education activity” for young children, they visit elementary and junior high schools to give eco classes. As a “Greening activity,” they increase flowers and green areas inside the university and operate community gardens with local people. At the CHECK section, students conduct monitoring and measurement to ensure that the planned items in the PLAN section are implemented. They also collect measurement records. Moreover, in internal audits, students prepare drafts of the plan, checklist and report and submit them to the Planning Committee. They also team up with faculty staff on the day of the audit and serve as auditors, auditing all (more than 120) units subject to the audit. In addition, students produce an Environmental Report, which details all of the environmental activities conducted throughout Chiba University for the year. A student serves as the chief editor for the report, under whom other students undertake all aspects of the publication, including creating the structure, collecting data, writing, and designing. At the ACT section, when the Environmental Management Manual

requires revisions, students prepare draft proposals and submit them to the Planning Committee. Students also prepare the required documents for renewing certification and accompany the assessors on the day of external assessment and create the minutes. In addition, the Student Committee also receives internal audit and external assessment every year.

2.2.3 Accreditation and qualification system. The third point is the Accreditation and qualification system. Chiba University considers the operation of EMS as an opportunity for students' practical education. There are lectures to learn about EMS, while environmental activities carried out outside the classroom are incorporated as part of the lecture, enabling students to get credits. There is a system of giving a qualification useful for job hunting if continued for three years. The details are explained below.

First, "EMS Practicum I" is for freshmen. Students acquire an understanding of the EMS and internal audit as well as business skills. They also participate in team activities with senior students. All students who are taking or passed Practicum I become members of the Committee.

In the second year, "EMS Practicum II" students who have passed Practicum I become team leaders and lead members in various activities and duties. They also take on the core EMS roles of basic training instructor, internal auditor, and record keeper of the proceedings of external assessments. The method for assessing students' achievement in Practicums I and II are also unique. In Practicum I, students' participation in Team Meetings and daily activities are considered in addition to attendance at lectures and test scores. In Practicum II, in addition to their attendance at Committee General Meetings, the students' involvement as basic training instructors, internal auditors, and record keepers of external assessments is also considered. Moreover, their production of a document regarding the handover of their duties to their junior colleagues serves as their end-of-year report.

The third-year course "EMS Practicum III" includes a five-day internship component where students demonstrate the knowledge and experience they have acquired over two years in an external organization or local government body, or the EMS-related department of a corporation and so forth. As practicum III courses are not essential, about ten students take this course each year.

Further, apart from Practicum III, students who have participated in the Committee for three years are awarded the qualification "Chiba University Environmental Energy Management Practitioner" by the President. It can be included on their resumes.

2.2.4 Acting as a nonprofit organization. The last point of the Method is the recognition as an NPO. The Student Committee was recognized as an NPO in 2009. This made it possible to act with the face of both the campus organization and the NPO. The president, all officers and members are students. There are three significant points to becoming an NPO. One is to make use of the knowledge and expertise gained from activities in the university to make it easier for activities to spread to the community. The second is to experience corporate management such as legal affairs and accounting. The third is to manage the budget and make it easier for various environmental activities. As an NPO, students conduct three projects. In the Environmental Education Project, students hold eco classes for children in local elementary and junior high schools and local events. In the Nature Conservation Project, they cooperate with some companies and once a month, they go to a natural area for thinning and weeding. It contributes to the improvement of a forest's CO₂ absorption and preservation of the eco-system. In the Environmental Activity Promotion Project, they make recommendations such as writing third-party opinions on corporate and other university's environmental reports.

2.3 Collaboration with companies

Collaboration with companies was indispensable for Chiba University to operate EMS. Moreover, in recent years, the Student Committee has expanded their range of activities and is working on projects cooperating with various companies. This section focuses on collaboration with companies.

2.3.1 Collaboration with companies on the campus. Compared to sustainable development goals, Chiba University's efforts consist of partnerships between faculty staff and students and have developed through collaboration with various companies. Since the beginning of ISO14001 acquisition, Chiba University has been collaborating with companies operating on campus such as restaurants, convenience stores, stationery shops and bookstores, who actively cooperate with the university EMS and may even receive internal audits. The university formally requests their contacts who have business with Chiba University but do not operate on campus for cooperation with EMS in writing.

2.3.2 Collaboration between the student committee and companies. The Student Committee is also conducting projects in collaboration with various companies as follows: One of the advantages of the students' collaboration with companies is that they can engage in activities beyond the boundary of a university. Utilizing the funds, know-how and personal connections that companies have, students can experience a level that they could not achieve by themselves. Another advantage is that as opportunities to contact workers in society are increased, they can acquire business manners and skills. Students can experience things that cannot be experienced in their usual student life, such as correspondence by e-mail or telephone with workers in society, visiting the head office and making arrangements for meetings, presentation at a press conference, etc. For the collaboration between the Student Committee and companies, there are four projects.

The first is "Satoyama preservation project". As mentioned earlier, the Student Committee is working as an NPO in cooperation with enterprises to protect forests, that is, "Satoyama" activities. In particular, the Student Committee has concluded a satoyama agreement with Kawasaki Kisen Kaisha, Ltd. in 2012, and has planted trees, thinned forests, and also carried out environmental education activities for children on site.

Secondly is "Utilization of used paper project". The Student Committee has been conducting a project to promote recycling of used paper in collaboration with Mitsubishi Paper Sales Co., Ltd since 2015. Contractors collected used paper discharged from the university free of charge until 2016. In this project, the company taught students that waste paper was being traded as a resource. Therefore, students proposed that the university sell them; the collection process was changed in 2017. Using the sales obtained, they developed some products like book covers and notebooks incorporating the original design utilizing waste paper and thinned timber in cooperation with the company. Moreover, in order to raise awareness of recycling wastepaper, they distribute or sell them to students and faculty staff.

Thirdly is "Environmental event project". The Student Committee held a big event aimed at improving the environmental awareness of other students and local people in February 2018. The students needed the cooperation of as many as ten companies to realize it. The contents of the event were; for example, a public recording of a television program collaborating with local stations, exhibition and test driving of electric cars and hybrid cars in cooperation with automobile companies, stage performance powered from an electric car, food and drink booths by local eateries, and lotteries with prizes of products offered by sponsors. It was a very successful event visited by 1,500 people from children to adults in one day.

After that is “Eco project with a local bank”. Chiba University and Keiyo Bank, Ltd., one of the major banks of the local community, agreed to comprehensive cooperation in 2012. As the common goal of contributing to the reduction of the environmental burden of the community and the improvement of environmental awareness is coming from both sides, in cooperation with Keiyo Bank and the Student Committee in 2017, the eco-project “From the Chiba to the Future of the Seven Colors of the Rainbow” began. There are three main points.

First is “Keiyo Bank supports the activities of the Student Committee”. To promote the construction of a sustainable campus at other universities, students have announced advanced initiatives of Chiba University at symposiums both in Japan and abroad. For students, it is a good experience of presentation. In FY 2017, the student committee received fund support of several million yen for travel expenses, etc. from Keiyo Bank, and 23 students were able to attend five conferences both in Japan and abroad.

Next is Consulting for acquiring “Eco-Action 21 by students”. This is a plan aimed to promote local companies to take environmentally conscious activities by acquiring Eco Action 21 (national certification on EMSs). Keiyo Bank introduces their business partners, students consult with them for Eco Action 21 acquisition and support when preparing their environmental reports. For students, it will also be a social experience involving companies as well as environmental education through consulting.

The last is “Seven environmental contribution plans originated with students”. This is a project to conduct activities on events that lead to the improvement of environmental awareness on local communities and stakeholders of Keiyo Bank. The Bank organizes mainly the preparation for holding individual plans, and the students are responsible for the creation and management of the contents. It is also an opportunity for environmental education and practical education for students. In this project, the following seven plans have been implemented so far. In the “Environmental seminar for companies” the students talked about their knowledge of environmental consciousness, etc., for the management of companies that Keiyo Bank is trading with. In the “Eco event for children,” the students held events for children to think about the environment through games and handicrafts. Keiyo Bank provided the place and opportunity for the event. At the “Promotion of local consumption of locally-harvested agricultural products fair” Keiyo Bank sold locally harvested vegetables and fruits in cooperation with farmers to advertise that it will be ecologically sound to choose and purchase local products in the event sponsored by the Student Committee explained above. In “Clean volunteer activities”, the students participated in a local coastal cleanup events and organized seminars for participants, in cooperation with the NPO introduced by Keiyo Bank. In “Setting-up of boxes to collect small home appliances in the bank,” event ten Keiyo Bank branches set up collection boxes made by the students and gathered small unneeded home appliances from citizens. The collected appliances are handed over to the recycler and recycled as medals for the Tokyo Olympic Games. In “Eco information release”, the students wrote articles on environmental issues and energy conservation etc. and posted them on Keiyo Bank’s Web pages and in publications. In the “Promotion of eco-efforts of Keiyo Bank” the students visited a branch of the bank and proposed eco ideas. Based on that, 20 branches set their own targets and worked on energy saving and resource saving activities. Keiyo Bank’s CSR department together with students evaluated the efforts and outcomes of each branch.

In this way, Chiba University not only manages the EMS through a partnership between faculty staff and students but also contributes to the environment of the community outside the university through a wide range of activities by cooperation between the Student Committee and companies.

3. Results of student-led environmental management system and reasons for continuation

Why has Chiba University been able to continue student-led EMS based on ISO14001 for 15 years? Why do about 150 people, 1 per cent of all students, participate in the Student Committee every year? For answers to these questions, the advantages for the university and the students refer to the analysis in this chapter.

3.1 Advantages for the university

There are four advantages for the university; “Environmental effect” in which environmental burden is reduced, “Economic effect” in which costs are reduced accordingly, “Social effect” meaning that the social evaluation of the university has improved by managing the student-led EMS, and “Practical education effect” that students improve various skills and abilities through activities.

3.1.1 Environmental effect and economic effect. The first two advantages to the university are “Environmental effect” and “Economic effect”. Compared with the figures before ISO acquisition, the environmental burden was drastically reduced along with the costs despite the increase in floor area and university population.

The floor area of the university in 2013 (excluding the ancillary hospital, which lies outside the scope of ISO application) increased by 28,373 m² (8 per cent) from that of 2004, before ISO14001 acquisition. Meanwhile, the university population (including the ancillary hospital where the members often belong to both faculty and hospital) increased by 506 (3 per cent) from that of 2005. Comparing the data in 2004 and 2017 (excluding the area of the ancillary hospital), the overall amount of energy input decreased by 6.2 per cent and 13.3 per cent per floor area. The water resource usage (sewage volume) decreased by 60.9 per cent and 63.8 per cent per area. General waste decreased by 52.8 per cent and 56.3 per cent per area.

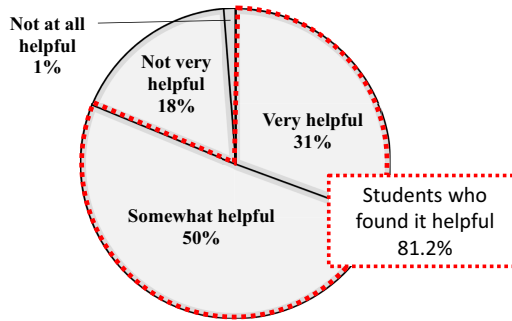
Thus, in the case of Chiba University, the acquisition and implementation of ISO14001 have had the effect of reducing energy and water usage at the university as well as reducing waste emissions. In particular, figures for all categories fell dramatically in the first three years after ISO acquisition. There were significant effects, including a decline in annual energy expenses for all campuses from JPY 1.1 billion in the academic year before acquisition to approximately JPY 140 million over these three years.

3.1.2 Social effect. Next advantage to the university is “Social effect”. Efforts of the student-led EMS were given wide attention from domestic to overseas onlookers. Chiba University has received inquiries and requests from universities throughout Japan and overseas intending to observe the initiatives. It has won 20 national environmental awards and 3 international awards including the prize introduced at the beginning of this paper. The university has been the subject of more than 100 newspaper articles.

3.1.3 Practical education effect. The fourth advantage to the university is “Practical education effect”. Students have developed various practical business skills through their activities. As mentioned above, students who participate in the Student Committee for three years are awarded the Chiba University Environment and Energy Management Practitioner qualification (“Practitioner”). In all, 424 students have acquired this qualification from 2005 to 2017.

From July to September 2014, a questionnaire survey was carried out for alumni of the Student Committee who hold the Practitioner qualification, whom 112 responded. Among them, 85 people working in the community were asked about the influence of the Student Committee activities on work. In response to the following question, more than 80 per cent of the respondents replied in the affirmative (“very much” and “a little”): “Did your activities in the Student Committee aid you in your work?” (Figure 2).

Figure 2.
Helpfulness of
student committee
activities to students'
later careers



Source: Created by the author

Furthermore, when the 69 respondents who replied in the affirmative were asked “What specific experiences were helpful?” approximately half of them responded that the experience of document creation, exchanges with faculty staff and external people, operating an organization, and chairing meetings were useful when they started their working lives (Table I).

Moreover, when the following question was asked to 85 respondents, “what kind of skills do you think one can acquire from conducting Student Committee activities?”, over half of them responded with “communication skills,” “setting targets, executing action plans, and completing projects,” and “collaboration” (Table II).

From the above results, it is clear that graduated members feel that their experience of committee activities have been beneficial when joining the adult working world and that participation in EMS had a positive impact as an opportunity to gain practical experience. This is clearly because the University, student-led EMS is a practical education for students.

3.2 Advantages for students

In order to analyze the advantage for the students, a detailed questionnaire survey and interviews were conducted on the students. There are four advantages for students.

3.2.1 Students can get credits. The questionnaire survey was conducted in both April 2014 and 2015 with a total of 155 freshmen taking the class “EMS practicumI”. In response to the question of why you entered the student committee, 66.5 per cent replied “Interest in

Experiences	No.	(%)
Creating business documents, such as plans, reports and minutes	37	53.6
Exchanging with faculty staff, and external corporations and groups	36	52.2
Operating organizations, such as committees and teams, and chairing meetings	34	49.3
Delivering presentations in front of people, such as making announcements in the general meeting	23	33.3
Completing projects for which one is responsible	21	30.4
Planning events and projects from scratch and executing them	20	29.0
Others	6	8.7

Table I.
Helpful experiences
(multiple answers
allowed)

Source: Created by the author

Table II.
Skills acquired from
conducting student
committee activities
(multiple answers
allowed)

Skills	No.	(%)
Communication skills	49	57.6
Setting targets, executing action plans, and completing projects	43	50.6
Collaboration/the ability to work in a team	43	50.6
Planning skills	40	47.1
Capability to involve others	40	47.1
Acting on one's initiative	37	43.5
Identifying issues	29	34.1
Business etiquette	27	31.8
Organization management	23	27.1
Creativity and innovation	22	25.9
Leadership	16	18.8
Others	1	1.2

Source: Created by the author

environmental problems,” and 56.2 per cent were “To get a credit”(Table III). As a result, it turned out that getting credits is one motivation.

3.2.2 Students can have practical experience. The questionnaire survey about the experiences and impressions of the Committee was conducted in December 2017 and 32 of the junior students who received the qualifications of the Practitioner answered.

Regarding “Experiences in activities,” most students selected “Environmental activities or environmental education activities within the university,” “Creating proposals or reports,” “Involved with faculty and staff in the university” and “Auditor of internal audit/making minutes of external assessment”. More than 70 per cent of students selected “Planning and executing a plan” and “Mail exchange with external people or faculty staff”, more than 60 per cent selected “Presentation to a large audience”, “Organizing meetings”, “Involved with external people” and “Organizing and leadership”. From these, it turns out that students do not only engage in environmental activities but also have practical experience and communication with people outside and inside the university. (Table IV).

3.2.3 Students can acquire practical skills. About “Whether you felt that your skills were acquired/improved through activities of the Student Committee in a four grades evaluation (4 = very felt, three = fairly felt, 2 = not very much, 1 = not at all)”, the average value of “Responsiveness” exceeded 3.5 and is the highest. Subsequently, “Environmental awareness, knowledge of EMS and ISO14001, etc”. is 3.44, “Communication skills” is 3.34, “Behavior/Execution skill” and “Identity/positiveness” are 3.28, “Problem discoverability,

Reasons	No.	(%)
Interest in environmental problems	103	66.5
To get a credit	87	56.2
To acquire practical skills	62	40.0
To make friends	44	28.2
Useful for job hunting	38	24.4
Interest in NPO	28	18.3
To acquire qualification of Practitioner	21	13.5

Table III.
The reasons for
joining the student
committee (multiple
answers allowed)

Source: Created by the author

Table IV.
Experiences in
activities of the
student committee
(multiple answers
allowed)

Experiences	No.	(%)
Environmental activities or environmental education activities within the university	30	93.8
Creating proposals or reports	29	90.6
Involved with faculty and staff in the university	29	90.6
Auditor of internal audit/making minutes of external assessment	27	84.4
Planning and executing a plan	25	78.1
Mail exchange with external people or faculty staff	23	71.9
Presentation to a large audience	22	68.8
Organizing meetings	21	65.6
Involved with external people (administrative officials, corporate officials, etc.)	21	65.6
Organizing and leadership	21	65.6
Environmental activities or environmental education outside the university	19	59.4
Exchanging business cards with external people	17	53.1
Exhibit at an event outside the university	17	53.1
Telephoning with external people or faculty staff	12	37.5
Visiting companies or administrations	10	31.3
Business travel using the budget of the university	9	28.1

Source: Created by the author

creativity” is 3.25 (Table V). It turns out that the students feel that not only knowledge of the environment but also practical skills such as correspondence ability and communication skill have improved. Although one student answered “1 = not at all” in “Environmental awareness, knowledge of EMS and ISO 14001, etc.”, it seems that this was because he belonged to the Committee from the second year.

3.2.4 Activities are fun, and they can make friends. Regarding the overall feeling of the activity, “Evaluation of impression of activities by the Student Committee were evaluated in four grades (4 = very felt, three = fairly felt, 2 = not very much, 1 = not at all), the average value was 3 or more except “It was hard”. In particular, 3.78 which was “It was a good experience,” 3.75 “I could make friends/associates” and 3.65 “It was fun” were highly valued (Table VI). For the students, it is found that the Committee activities themselves were pleasant and they had an impression that they made friends.

3.2.5 Interview with students. As a result of interviews with students on what they actually felt and got from the Committee activities, Yashiro Jiei who is a second grade student in the faculty of Law, Politics and Economics and a leader of the group tasked with responding internationally in the Committee answered thus:

The first thing is business skills which we cannot learn easily during our normal life at university. If we want to lead an event produced by students, we have to make an event proposal, give a presentation to executives, and get permission to act. After the event, we have to submit reports too. Sometimes we send e-mails to staff of corporate companies or the local government to make arrangements to organize and hold conferences. Also, I belong to the secretariat, so I have to organize documents and interview responsible people of each department about whether they are carrying out appropriate activities or not. There are not many chances to gain such experiences that could make us prepared for society after university. Secondly is the opportunity to find chances to improve my skills. We can brush up our potential through giving a presentation in an international conference, setting a meeting with overseas students, leading a large event to highlight environmental problems. Our committee always gives us these chances to grow. Finally we can gain friends who can work together. We can foster an extraordinary sense of companionship as we tackle our plan to make it successful. Being able to find your place and your people is one distinctive characteristic of our committee.

Skills	4	3	2	1	Average	Management system in Chiba University 1369
Responsiveness (Flexibility to understand differences in opinion and position, circumstance grasping power to understand relationships around)	18	13	1	0	3.53	
Environmental awareness, knowledge of EMS and ISO 14001, etc.	17	13	1	1	3.44	
Communication skills (Communication, claims, sharing skill, listening ability, harmony, presentation)	11	21	0	0	3.34	
Behavior/Execution skill (Planning for the target, planning ability, scheduling skill)	13	15	4	0	3.28	
Identity/positiveness (Power to work on things, interest, motivation, challenging spirit, ambition, extroversion)	13	15	4	0	3.28	
Problem discoverability, creativity (Ability to analyze current situation, clarifying purpose and tasks, and creating new values)	13	14	5	0	3.25	
Leadership Teamwork (Sense of responsibility, awareness, cooperation, encouragement, ability to involve others, organization management)	12	14	6	0	3.19	
Business ability (Basic business etiquette, ability to create documents, view of labor, job consciousness)	11	13	7	0	3.13	
Knowledge and academic ability (Basic academic ability, PC literacy · operation, information processing application)	10	16	6	0	3.13	
Social responsibility awareness (Discipline, power to keep rules and promises, integrity, public mind)	9	18	5	0	3.13	
Self-management ability (Stress control power, patience, ability to resolve conflicts/feuds)	8	19	5	0	3.09	
Logical thinking/Critical thinking ability	9	14	9	0	3.00	

Source: Created by the author

Table V.
Whether you felt that your skills were acquired/improved through activities of the student committee (4 grades for evaluation)

Impression	Average	Table VI. Evaluation of the impression of activities by the student committee (4 grades for evaluation)
It was a good experience	3.78	
I could make friends/associates	3.75	
It was fun	3.65	
I felt rewarded	3.59	
I think I've matured	3.41	
I gained confidence to go out into society	3.06	
It was hard	2.63	

Source: Created by the author

Also, Souichiro Higuma, a student in his fourth year in the faculty of Engineering, who served as the chairperson last year (2017) and retired in December said:

I consulted with a lot of staff at the university and regional organizations to engage in activities over three years. Therefore, I recognized that a student-led EMS organization of Chiba University fundamentally allows an opportunity to help and understand them. In the first year, I took part in

many activities like teaching children the importance of classification of garbage through games and so on to experience many things for myself. In the second year, I served as a leader of the project involving many people for the first time. I felt the difficulty in dividing the work, assigning it to many people, and supervising it. In the third year, I ended up serving as the leader of the organization. Thanks to the experience in my first and second year, I learned to manage the organization. I realized that it is vital for leaders to think of the position of other people. Three years of activities have broadened my outlook remarkably.

Yatsushiro is still a sophomore, but already has various experiences and feels that he has acquired business skills. The fourth grader Higuma who has experienced the operation of the organization says that he has acquired the ability as a leader in addition to business skills. From this, it can be seen that the Committee's activity experiences have become a personal skill in each grade. The cause of acquiring these abilities lies in the method of operating the committee activities. As Yashiro stated, students write proposals at the time of planning, present them at the ISO planning committee of faculty staff and obtain approval of the contents and budget. Therefore, they must contain the purpose of the project, details, schedule, budget, past reflection and points for improvement, etc. Teamwork is also necessary for implementation of the project. They have group meetings many times to decide the contents, preparation procedures, role sharing, etc. before execution.

On completion of the project, they prepare a report for presentation at the planning committee including the outline, results, income and expenditure, reflection points and the next improvement points of the project. Proposals and reports are firstly checked by senior members and amended several times before submission to the planning committee, where, students receive questions and opinions from faculty staff and sometimes rework the project. In other words, the process of implementing one project is incorporated with planning, preparation, execution, and review as a PDCA cycle (Plan-Do-Check-Act). In addition to acquire practical abilities, it is considered to be a great advantage for students to have fun and to make friends.

4. The issues of student-led environmental management system

This section compares the challenges faced generally when operating EMS in a university with the case of Chiba University. In particular, it analyzes the issues concerning students with reference to the examples of Mie University and Iwate University.

4.1 Comparison with the issues of ISO14001 certified universities

The first Japanese university acquired ISO 14001 in 1998, and 71 have acquired it since then, but as of 2016, 39 have not continued (Okayama, 2017a, p.57). According to Okayama, 2017b (pp. 227-229), who researched the issues related to the continuation of ISO14001 at universities that have acquired this, there were human/organizational issues, administrative burden issues, cost burden issues, issues concerning effects, and issues concerning students and student organizations.

Human and organizational issues are university-specific issues that arise from the existence of faculty, staff, and students from different positions, and from the fact that it is difficult for all faculties to gain an understanding. On the contrary, Chiba University started with the ISO14001 certification kickoff declaration by the president, and initially worked to disseminate efforts, by distributing an e-mail magazine to faculty members once a week. As a result, the existence of the Student Committee has become well-known, and as students are doing their best, there is also a positive effect that faculty can't neglect.

The next issue is, burden such as preparation of documents and records and internal audits that are required for faculty and staff, but at Chiba University, the Student Committee

prepares the draft of most documents necessary for EMS. In addition, as the students also take on the role of internal auditor, the burden on the faculty staff is minimized.

The issue of cost burden is the cost of external examination and the labor cost required for EMS operation, but at Chiba University where students operate EMS, the staff cost is minimal. Examination cost is essential, but considering the environmental load reduction effect and socially evaluated results, the university regards it as a necessary cost.

The issue concerning the effect is the issue that the reduction of environmental load has reached the limit and cannot be reduced further. Although Chiba University has remained the same or slightly decreased in recent years, it has had a clear effect compared to the period before acquiring ISO as mentioned above. However, there is still room for improvement such as introducing renewable energy and energy-saving equipment.

Issues related to students and the student organization include eco-education for students every year, continuation of student organization and maintenance of their motivation, and quality assurance of student activities. At Chiba University, the Student Committee conducts basic training on EMS to all students at the beginning of each year as a part of their education. The devices for continuing the committee are “Accreditation and Qualification system”. The quality of activities is improved by having them linked with programs.

4.2 The issues of student-led environmental management system

In addition, Mie University and Iwate University introduced the student-led EMS based on the Chiba University method, the student committee is regarded as one of the university organizations, and various activities are performed by the students in cooperation with education. As a result, students are motivated to belong to the committee, and it continues as an organization with more than 100 students each year. However, there are three issues common to the three universities. The first is the burden on the students. This means that work is biased to specific students who are motivated and that they are exhausted. The second is that activities become more common. There is much to be done every year, and it is satisfactory to complete them, making it harder to start new things. The third point is that there is a difference in environmental awareness between students who belong to the Committee and those who do not (Okayama, 2018, pp. 35-39).

While various issues faced by universities that acquired ISO14001 in Japan can be solved by deploying student-led EMS, there are also issues due to students' performance. Considering the burden on students, it is necessary for the faculty to watch carefully and to coordinate work. In order for students to be active, it is necessary for the faculty to nurture the desire to transform activities that students have long participated in and to try new things. Moreover, students must always act to enlighten the students from outside the Committee.

5. Social significance of this case study

In this section, it is mentioned that the student-led EMS is an active learning model which can be practiced outside the classroom. Furthermore, compared with internships promoted in Japan and regarded as active learning outside the campus, it refers to the superiority of student-led EMS and the possibility of introduction in other universities.

5.1 Student-led environmental management system is active learning

Student-led EMS based on the “Chiba University Method” can also be regarded as “active learning”. First of all, regarding the definition of active learning, Bonwell and Eison, 1991 (p. 2) mentioned:

Though the term “active learning” has never been precisely defined in educational literature, some general characteristics are commonly associated with the use of strategies promoting active learning in the classroom.

Then the general features of active learning are summarized in the following five (p. 2):

- (1) Students are involved in more than listening.
- (2) Less emphasis is placed on transmitting information and more on developing students’ skills.
- (3) Students are involved in higher-order thinking (analysis, synthesis, evaluation).
- (4) Students are engaged in activities (e.g., reading, discussing, writing).
- (5) Greater emphasis is placed on students’ exploration of their attitudes and values.

Also, [Prince, 2004](#) (p. 1) said:

Active learning is generally defined as any instructional method that engages students in the learning process. In short, active learning requires students to do meaningful learning activities and think about what they are doing

[Mizokami, 2014](#) (p. 7) defined:

Any active learning in the sense that it overcomes (passive) learning of listening to unidirectional knowledge transfer lecture. Active learning involves involvement in activities such as writing, speaking and presenting, and externalization of cognitive processes arising there

To summarize what is common to the three above, active learning is “what is not one-way knowledge transfer type”, “students involved in activities” and “thinking about activities”. Student-led EMS at Chiba University, the student himself thinks about the work related to EMS and various activities of the Student Committee. Moreover, by preparing the report after the activity, they evaluate and reflect on the activities for future reference. By certifying it as a credit, teachers guide the students properly. This can be said to be active learning which utilizes the whole university which does not fit within the classroom. By introducing the Chiba University Method in other universities, it is possible to obtain the same effect of reducing environmental burden and practicing such active learning.

5.2 Comparison with internship

In this section, the internship issues promoted in Japan are discussed and compared with the student-led EMS. The Japanese government announced the “basic idea of promoting internship” and promoted internship to send students from universities to enterprises etc. in 1997. It was revised in 2014 and universities, etc. are required to train human resources having necessary abilities as workers in society such as the “fundamental ability of society people” such as task discovering/exploring ability and execution ability, and “fundamental/general purpose ability. As its effective means, it is considered necessary to promote internship, which is an opportunity for students to deepen their practical knowledge about industries and society”.

In this way, students are promoting internships in companies in Japan, but according to [Okayama, 2017a](#) (pp. 185-189), there are six issues to implement the internship. One is that the period is too short to obtain the expected educational effects. In a short-term internship, students end up with company tours and little experience, which places a heavy burden on companies. Second, the work content to be carried out is left to the host company, and the student is handled as a labor force in some cases. Third, it is difficult to secure companies that accept internships. The reason is that there is a burden on companies accepting

internship students and the relationship between teachers and companies is sparse. The fourth one is the economic burden on the students. In the case of long-term internship, students will be responsible for transportation expenses to attend enterprises in some case, and they will be absent from classes during that time, or they will be unable to work a part-time job. The fifth is the burden on the university side. In order to prevent inconvenience to companies, faculty members conduct training in advance for students and meet with companies. Finally the lack of students' basic abilities and manners. They appear to lack the basic ability as a social occupant, and manners are bad, sometimes causing inconvenience to companies.

The internship is aimed at practical education to nurture talented people who have necessary skills as workers in society, but because they are seeking educational sites in companies outside the university, there are various problems. Meanwhile, as the student-led EMS conducted by Chiba University operates within the university, it can be implemented for a long time, there is no need to search for a company to accept them, there is no economic burden on the students, there is no hindrance to the classes. Moreover, because the student is responsible for part of the university's operation of EMS, the burden on faculty and staff is rather reduced. Even if it causes some inconvenience to the faculty staff due to the lack of students' manners, it would be natural to teach the students manners on the campus. Therefore, by introducing a student-led EMS, practical education can be practiced on campus without leaving it to companies.

5.3 Spread of Chiba University style over Japanese universities

Thus, the student-led EMS can practice not only environmental education but also practical education aimed at by the internship as active learning in the university. It would be possible for other universities to reduce environmental burdens and obtain such educational effects by introducing the Chiba University Method.

As mentioned earlier, among the key points of the Chiba University Method, the important points to introduce student-led EMS and to continue it over the long term are "Establishment of the student committee as one of the university's organizations," "Students undertake core operations related to EMS" and "Accreditation and qualification system".

As previously mentioned, actually, Mie University and Iwate University who established student-led EMS with the Chiba University Method acquired ISO14001 in 2007 and 2010, respectively. Both universities have reduced the environmental burden after ISO14001 acquisition, and environmental education and student-led EMS operations are externally evaluated. Also, as a result of the questionnaire to their students, both universities have realized that the students feel that they have had experiences related to society, and that such practical experiences cannot be experienced elsewhere. Business skills were also acquired through the activities (Okayama, 2018, pp. 36-39). In this way, other universities not only in Japan but internationally could introduce a similar mechanism.

6. Conclusion

This case study explained the four critical points of the "Chiba University Method" that supports Chiba University's "student-led EMS". First, the Student Committee was established as one of the university's organizations. Second, students are engaged in activities related to the core operations of EMS and various environmental activities. Thirdly is the accreditation and qualification system. Students can earn credits and a qualification by conducting the activities. Lastly, the Student Committee was recognized as an NPO and activated activities outside the campus. In recent years, the Student Committee, who has gained experiences in university activities has expanded the scope of activities in collaboration with companies.

Moreover, it analyzed the merits of the university and the students in order to clarify why student-led EMS efforts could continue for 15 years, and why more than 1 per cent of students participate in the student committee every year. As a result, it became clear that there are advantages for universities such as reducing environmental impact and cost, improving social evaluation, and practical education effects. On the other hand for students, there are benefits such as acquisition of credits, practical experience, improving practical skills, and developing friendships. However, there are also problems that occur because of student-led EMS such as burden on students, and it is necessary for faculties to be aware and correspond with them.

Finally, regarding the social significance of this case study, the student-led EMS can be regarded as active learning practiced outside classrooms and practical education within the campus, overcoming the internship issues. There are various issues for universities to continue EMS, but most of them can be solved by operating student-led EMS.

Prof. Hidefumi Kurasaka invented the Chiba University Method at the beginning of 2003 and introduced it to the university, and he has been developing and championing it for 15 years. In recent years, Professor Kurasaka and the Student Committee are making efforts to expand universities that carry out sustainable efforts by presenting the case of Chiba University domestically and overseas.

As in this case study, by practicing student-led EMS at university, it is possible to construct a campus with less environmental impact. Moreover, by collaborating with companies, it is also possible to conduct activities involving the local area against environmental problems. It is expected that students will be able to expand knowledge on environmental management, awareness of eco-consciousness and acquire useful skills in society. Based on this case study, it is expected that the number of universities that will work with student-led EMS will increase. The important thing is that every university can be a site of active learning where environmental education and practical education are carried out by student-led EMS. Based on this case study, it is expected that the number of universities working with student-led EMS will increase.

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Further reading

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