Preparing for a Study Abroad and Opportunities for KCCT's Students in the University of Hawai'i

Yutaka TAKASHINA*

Keywords: study abroad, University of Hawai'i, Intelligence Earth Science Program, lava flow

1. Introduction

For the Kobe City College of Technology's (KCCT's) Students, studying abroad is a valuable experience. That will determine their future work in the world. In particular, the United States are a major economic center of the world in new era globalization after the industrial revolution in the Meiji era. Japan learned from Western technology and achieved high economic growth. On the other hand, war broke out in Ukraine this year, and the confrontation between the United States and Putin's Russia became conspicuous. In addition, the relationship between Xi Jinping's China and the United States has deteriorated, and Diplomacy in Japan must also be vigilant about the Taiwan emergency. Japan's defense system with its Asian many neighbor's areas, including North Korea's discharge of a large number of missiles assumed nuclearization, became a major issue. In terms of world economic policy as well, disparities due to monetary and interest rate policies and changes in the era of COVID-19 have distorted the global economic balance and led to a higher price of living in Japan, with the depreciation of the money compared to the American. When the world situation changes drastically, the ideas of young people can greatly change the future of the country. We must aim to develop engineers who can excel more on a global scale at our college, and play an active role on the world stage, based on our educational policy of enhancing education with a rich international perspective. However, studying abroad requires a large amount of money. In addition, it is difficult to say that the curriculum of our college is planned enough about abroad study exchange of class credits. It hopes appropriately matching credits and learning objectives clearly. Studying abroad at a vocational college requires scrutiny of programs that further enhance specialization. In this report, we focus on the significance and benefits of forging an International Exchange Program with the University of Hawai'i. As shown in **Figure1**, this program looks at living teaching materials through global issues. This report is based on cooperated by staff members of the International Exchange Center in University of Hawai'i at HILO (UHH) and Hawai'i Community College (Hawcc). The goal is to create an International Activities Program that is suitable for KCCT's students who will be responsible for the future to make effective use of the semester system and receive subsidies from Japan Student Services Organization (JASSO). And this report was also composed by cooperation of Mr. Todd Shumway of the international exchange center in UHH and Ms. Eri Hall in HawCC. It is essential to develop engineers who can solve problems on a global scale. The purpose of this report is to provide information on how to improve human resource skills with an international perspective. It will lead the world stage, as well as opportunities to prepare for it.

Figure1. Birth of the new earth floors by eruption's lava flows through towards the sea

* Associate Professor at Civil Engineering Department

2. Study Preparation of the Intelligence Earth Science Program

As someone who has always aspired to become a civil engineer, I am convinced that if I can design a program that allows me to appreciate the breath of the earth and consider how people live, it will be the best preparation for studying abroad. Since erupting January, 1983, Kilauea Volcano on Hawai‘i Island has continuously been active, with brief pauses, for over 35 years. “It’s important to note that Kilauea is still an active volcano that will erupt in the future, and associated hazards have not changed,” reported the U.S. Geological Survey’s Hawaiian Volcano observatory (USGS). The Pu‘u‘O‘o’s volcano crater on April 30, 2018 led to an unexpected new eruption, it is greatly effected as continue many eruptions and damages later in the Leilani Estates subdivision in Puna. Since the Pele god, quieted down in early September 2018, lava had blanketed nearly 70 square miles while destroying 1,000 structures and displacing hundreds of human residents[1)]. I am especially invested in learning the live teaching materials through a volcano. We will proceed with the planning of a continuous program that can intelligently predict the damage of the eruption. As Mauna Loa volcanic activity is also active on November 27, 2022.

2.1 Nature and Life experience with awareness of the earth itself in Kilauea volcanoes national park

The significance of studying abroad at the University of Hawai‘i at Hilo (UHH) and Hawai‘i Community College (HawCC) is to have an environment of nature science learning materials that allows students to be conscious of the global environment. For example, eruptions such as the Kilauea volcano in 2018 and scorching lava flows have taken the lives of many people along with their precious homes and possessions. However, the residents who believe that nature is alive with appreciate feeling, do not resent the damage. The greatest attraction of the University of Hawai‘i and its colleges is the presence of living teaching materials that are between life and death. The earth and the sky are considered as the live teaching materials. It is based on Intelligence Earth Science Program. **Figure1** shows the birth of earth through lava flows in the sea. This research report introduces outstanding researchers in volcanology from the University of Hawai‘i at Hilo. And Hawai‘i Volcanoes National Park in the nature field learning and Art center. An example of volcanic field activity and Photographer’s Mr. Bruce Omori is shown in **Figure 2**. Photographs of volcanic activity teach us about the way humans and the earth live.

Figure2. Hawai‘i Volcanoes National Park and photographer’s Bruce Omori

2.2 Researcher Interview in University of Hawai‘i at Hilo (UHH) about volcanology and geology

What are the most important features of volcanoes and lava flow, which represents the breath of our earth ? Some questions were actually heard to by Dr. Steve Lundblad in UHH, Professor of Geology and Chair of the Geology Department. Here were his answers as next follows.

a) How did the eruption changed the magma and underground structure since the 2018 ?

The 2018 eruption in Puna (Leilani Estates) was the result of magma moving further to the east from where it stopped and erupted (Pu`uo`o crater of a volcano) for about 35 years. It is still in the rift in lower Puna, as proven by the heat still coming to the surface. It will likely continue to cool down there for many years. At the summit, magma evacuated the shallow magma chamber and supplied the lava flows in lower Puna. There was significant collapse of the caldera now. There is a deep lava lake that is filling the void left behind. So I guess we could say that the collapsed area is enough to gather magma making it the surface in quantities due to the events of the 2018 eruption.

b) What kind of geologist research do you (or university students) mainly do?

The students and I mainly work on measuring active faults south of Kilauea summit. There was significant motion on some of the faults (up to 40 cm of vertical offset). We also tracked the movement and displacement of the magma moving into the area last year (Fall 2021) before the current lava lake formed, by measuring ground deformation. We have sent three groups of students to regional and national Geological Society of America meetings to present their results. It is good experience for all of them. Kilauea's activities in 2018 and Mauna Loa's activities in 2022, I’m very confused. When I face these events, I am moved to the field of natural science.

I also believe that this experience will be useful for Japan's active volcanoes such as Mt. Fuji.

Figure3. Researchers in Geology Department in UHH (Professor Dr. Steven P Lundblad, Mr. Todd Shumway, etc.)

c) Can we predict lava flows in the future?

This is very difficult in the long term. But it is reasonably reliable in the short term. For example, in 2018, scientists tracked ground deformation and seismicity from Pu`uo`o. Many geological scientists around the world predicted (with some uncertainty), that an eruption was likely to soon occur in the east area. 3days later, lava started erupting at the surface in Leilani Estates. Similar damage types of features often are precursors to new volcanic eruptions, but they can only be detected a few days or hours before an eruption occurs. It is impossible to say, for example, when Mauna Loa might erupt again until some specific signals are showing up (magma moving to the surface). On **Figure 3** are shown researchers in volcanology in the University of Hawai'i at Hilo. To predict short time disasters and attempt prediction on long term ones, I study prediction of the lava damage from deep learning model with artificial intelligence. It would be my life's work.

d) How did many lava flows impact the local residents?

There are still main roads covered with lava. About 900 houses were completely consumed by the lava. Land that was used for agriculture and many homes are unusable. The road to recovery is very long.

e) What kind of lava disaster prevention and mitigation education is being conducted at your university?

The 2018 eruption is a cautionary to our future. Many people are living in "Lava Zones 1 and 2" land. That place has the highest probability of being overrun with lava. We also do a lot of public outreach on lava flow hazards. But our island in general doesn't seem to prohibit development anywhere based on lava flow hazards.

Thanks deeply to Dr. Steve for many difficult answer questions.

The cycle of volcanic activity in Hawaii, the origin of the earth, is a mysterious world that no one knows.

It is very significant matter that the construction of an intelligent information technology program can contribute to the prediction of eruptions.

2.3 Tsunami in Hilo Bay and Japanese disaster prevention and mitigation education program in Earth science

Hilo is also a down town of many Japanese. It has been damaged by tsunamis many times. The sight of the damage caused by the tsunami caused by the Great East Japan Earthquake is unforgettable. In Kobe city, we have a big Hanshin-Awaji Earthquake. Nankai Trough Earthquake also expected in the near future. It may cause a destabilize Japan's socio-economy. And this report also introduces the tsunami's damage mainly against Hilo Bay. There is a tsunami museum in Hilo Bay. Mr. Todd Shumway introduced me to Ms. Kayla McKown, a graduate of the University of Hawai'i at HILO on 2017. She says the 1945 tsunami came from Alaska and destroyed downtown of Hilo. Isn't there a concrete wall in this place where tsunamis hit repeatedly? Why don't you people move to higher ground? I asked some questions. Her answer was that local people love the city of Hilo. It is the most importance issue for civil engineers to take local sentiments, heart feeling and kindness into account when implementing recovery plans.

Figure 4 is shown in Hanshin-Awaji Earthquake damage and Ms. Kayla McKown in tsunami museum.

Figure4. Hanshin-Awaji Earthquake damage and Ms. Kayla McKown at Hilo's tsunami museum

2.4 International exchange in Hawaii campus life

We explain the experience the lecture and culture of the Hawai'i University campus life and Hawai'i Community College campus life. I have fond memories of walking around the large campus of the University of Hawai'i at Hilo with Mr. Todd as part of a university tour of the various facilities. I also participated in lectures with students in the classroom.

(1) The University of Hawai‘i at HILO and Campus

Taking English classes abroad is appropriate for relearning. Since I have learned most of the academic content once, I can feel that my expressions, points of emphasis, and attitudes toward learning will naturally change.

Figure5. Complete library with PC

Figure6. Geology Lecture in the classroom

Figure5-8 is shown the UHH campus life. The English understanding is difficult, but we can be caught about the outline of contents. I was in a position to teach it until now, but I learn again and carry out rectification, and I want to be challenge the new world. As a concrete engineering major, I can find a lot in common with rocks and their diagnostics. By making use of non-destructive inspection and computational processing, we will create a concrete program through interaction with university professors.

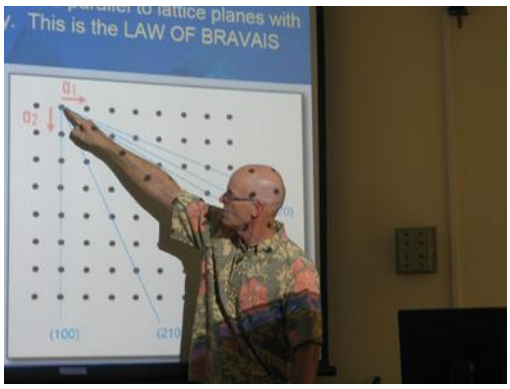

Figure7. Professor toward the earnest lecture

Figure8. Some used textbooks are sold at the bookstore and UHH service campus center

(2) Hawai‘i Community College lifestyle

Hawai‘i Community College (HawCC) has a fine support system for self-learning. By support staff cooperation, it is improvement of problem-solving ability. Access to the University of Hawai‘i at Hilo is easy for HawCC students. And the accessible facilities include dormitories. HawCC students can experience 4 year university campus life while studying at HawCC. Students will make friends with the UHH students as well.

Figure9. Hawai‘i Community College Campus

Local people won’t understand Japanese but with their culturally diverse backgrounds, they are kind and patient so they will listen to you even if your English is not perfect. The Intensive English Program (IEP) is designed for students to learn academic English skills to be successful in future. There are 3 core classes of Writing & Grammar, Reading & Vocabulary, and Listening &Speaking. **Figure 9** shows in HawCC’s Campus Life.

In Intensive English Program, age ranges are very wide and some are active members of the society having a job or being married with children while they take classes. As for the Intensive English Program, we regularly have non-traditional students and some could be in their 30's-40's taking off from work and studying abroad. The other could be people who retired from their work.

(3) Kobe City College of Technology (KCCT)

Kobe City College of Technology offers a curriculum in combined the experiments and lectures. In particular, civil concrete engineering experiments have been consistently conducted from formulation to RC beam and load-capacity calculations in **Figure10**. And more curriculums arrangements have been made to enable students to content qualify for concrete diagnostics.

Figure10. Concrete Mix and Beam experiments

3. Many Hawaii's Lifestyle Consideration of about water supply and sewerage etc.

The Hawaiian lifestyle has many faces. There are many contents such as bee dance and traditional Japanese karate. Bee Dance brings awareness to the honey bees with an audio and visual celebration. I feel the most important connection between people there. **Figure11** is shown in Introducing Local programs as Bee dance and KARATE in Hawaii. KARATE's Teacher is very severe for me.

Figure11. Introducing Local Programs as Bee dance and KARATE in Hawaii

Figure12 is shown in Hula pretty girl in big island's OKINAWA people and Mountain View. On the Big Island, there are 4 active volcanoes which are, Kīlauea, Mauna Loa, Hualālai and Mauna Kea. The mountains on the Big Island of Hawaii are taller than Mt. Fuji. However, because the lava is not sticky, the mountains form gentle ridges. The top of the mountain exceeds the height of the clouds, so most days are sunny and we can see the sky full of stars.

Figure12. Hula girl in big island's OKINAWA people and Mountain View

There is an active volcano under the sea called Kama'ehuakanaloa (Lō'ihi), located southeast of the Big Island. And it comes from the fact that King Kalakaua, who revived hula, which was banned by Christian missionaries, was called "Merry Monarch". The Merrie Monarch Festival brings the entire city of Hilo to life with hundreds of hula dancers. And many Japanese Americans live in Hawaii. Okinawan people also gather at Waimea. In Hawaii, there are many lifestyles viewpoint. Hawaiian Life style's consideration is very necessary.

For example, Japan's waterworks and sewerage facilities are entering a deteriorated situation by many factors. However many of the people living on the island of Hawaii use rainwater. And by returning sewage and filth to the natural soil and land, perform microbial decomposition treatment. The steel construction of rainwater storage catchment systems and the use of sewage treatment in catchment tanks buried in the ground have become established. That is nice ideas. An ecological sense can be learned from Hawaii. Rainwater storage catchment system is shown in **Figure13**. The Hawaii Island makes for a massive land and has been recently focusing on a recycling-oriented society using the best of its blessed natural environment. The lifestyle is different from Japan's lifestyle. There are many points that can be used as a reference between two wheels of a social infrastructure development and environmental protection. For the people of Hawaii, water is life itself. The circulation of water feels like human breathing.

Figure13. Rainwater storage catchment

4. Self-learning and problem-solving ability support system.

Academics should basically be learned by one. Through Covid-19, our lifestyle has changed greatly, and the way we learn has changed greatly. For example, classes are not just a place to provide knowledge, but by using on-demand and YouTube, the students can dig deeper into their own goals and majors from their own learning awareness.

However, most Japanese people have a big language barrier, and they are not able to make use of the skills they have acquired for their future goals. Therefore, that is an important for introducing IEP programs from Ms. Eri Hall that can help promote international exchange.

5. Recurrent Education

I am very supportive of the work system reform. The work style reform aimed at work-life balance so as to improve total factor productivity (TFP).

A declining birthrate and an aging population is very serious problem. Redress disparities is necessary. We have telecommuted from now. If technical college classes can be delivered on demand, students from all over the world will want to research the content. Learning is meaningful only when it can be used in work and real-life. It should not be for testing or educational score only. When studying abroad, we can freely choose our studies. The true learning way of class evaluation is determined by the need for viewing from the world. We want to learn what we need to do again. Learning that is not relevant to our real-life is meaningless. What supports recurrent education is the degree of freedom in the curriculum. We should choose by ourselves, not what is prepared in this research report, the International Exchange Center in the University of Hawai‘i at HILO and Hawai‘i Community College is produced about Recurrent Education. Because new learning is again, there is an opportunity to discover it is very significant from now on.

6. Interactive learning of the University of Hawai‘i

6.1 With the University of Hawai‘i at Manoa

The author is submitting with Dr. Lin Shen to ACI materials journal as a joint signature author.

He belongs to University of Hawai‘i at Manoa (Oahu). **Figure14** is introduced in having the joint researchers with Dr. Lin Shen in UH. By thanks his cooperation, the concrete laboratories and classes at the University of Hawai‘i have become more familiar to me. And I became a member of the Concrete Society of America. Now, I belong to ACI and JCI member.

Figure14. Shared a joint signature research with Dr. Lin Shen in UH

And the author’s Takashina also participates in ASNT’s international symposiums conferences on non-destructive testing and conducts exchange activities with American researchers this year. In addition, the author has also participated in practical training for material experiments with students from the University of Hawai‘i at Manoa. Actually I studied mortar flow test, steel rebar tensile test with University of Hawai‘i students. The experimental content was almost the same at our KCCT.

Figure15. Appearance of a lecture and Experiment in the University of Hawai‘i at Manoa

Especially in the field of specialization, I think that English of the curriculum is on-demand or online in becoming it and wants to cooperate with KCCT and UH in advanced learning. At the lunch time break, I could observe several booths showing a sign of political activity from the students on campus. Many campus

activities show in **Figure15-16**. The lively atmosphere of America became a comfortable place for me.

Figure16. Political activity in campus lunch time

I just looked at the student's experimental result report, homework, and examination, but I think that a classroom lesson can be enough followed if used to English in **Figure17**. The experiments that I experienced at the University of Hawai'i were tensile tests of steel bars and flow tests of mortar, which are at the same level at our colleges. It would be good if we could discuss the experimental results by online in the near future. It's wonderful to learn how students with different habits can spread out and acquire perspectives that open their eyes to the world.

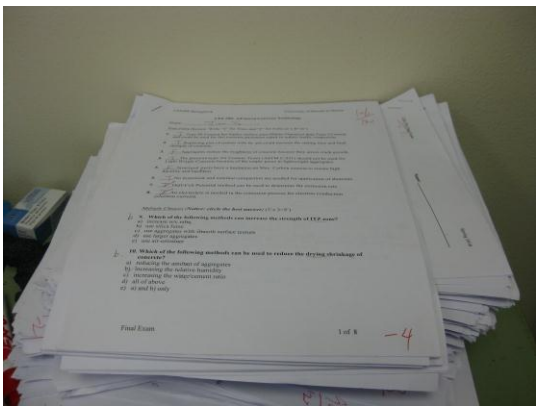

Figure17. Experiment report and test by student

6.2 Concrete Inspector and Deep learning

In establishing an international exchange program, we are considering exchanges based on deep learning model technology, using concrete diagnostics, non-destructive technology and its qualifications lesson as program contents. RC's inspector verifies work experience in reinforced concrete construction inspection. And there is the aim of our fusion program in the information education with the artificial intelligence and English language education. It is important to create a sufficient academic environment that encourages study abroad. To facilitate exchanges, there must be very appropriate commonalities between researchers and mutual benefits.

7. U.S.-JAPAN International Relationships for Science and Technology Cooperation

The U.S.-Japan partnership in the science and technology covers a broad array of complex issues facing our two countries and the global community. Under U.S.-Japan Science and Technology, both countries should increase the collaboration in the scientific research domains in the future. Those scientific researchers are in areas such as new energy technologies, AI deep learning, supercomputing, and new materials. The U.S.-Japan's international technology is very necessary for Comprehensive Dialogue Science by deepening cooperation. And I was also able to participate at 7th US-JAPAN NDT SYMPOSIUM 2022 in Hawaii BigIsland. The opening ceremony is shown in **Figure18**. Through presentation and interchange of Non Destructive Inspection, closes of the learning fusion were recognized well. The field of non-destructive testing is being explored from all angles of engineering. However, there are many limitations when trying to apply it to concrete. How to efficiently measure the quality of internal spaces in the field of concrete? It has the ability to search for broken steel rebars in the depth direction of concrete. There is a demand for a method that can rationally grasp a huge amount of concrete structures.

Figure18. 7th US-JAPAN NDT SYMPOSIUM
In Big island's WAIKOLOA (08/23-08/26/2022)

Before the presentation of the symposium, I am full of the feelings of thanks for the homestay owner's talking in **Figure19**. I had a long time in the middle of the night, and I was able to get on the old age consultation with owner. That owner had been within a spirit of aloha.

Wind of Hawaii was breathed in and was relaxed with a feeling and had taught that I did its best step by step.

Figure19. Owner had been within a spirit of aloha

8. Hawaiian Volcano Observation Status at Mauna Loa eruptions at 11/27/2022 by U.S. Geological Survey

The volcano erupted while I was writing this manuscript. This nature living materials are endlessly fascinating. However, I am worried that local residents will be harmed again. By USGS reports, the Northeast Rift Zone eruption of Mauna Loa continues, with two active fissures feeding lava flows downslope. The fissure 3 lava flows are travelling to the north, still moving toward the Daniel K. Inouye Highway (Saddle Road). Fissure 3 remains the dominant source of the largest lava flow. Pele's hair (strands of volcanic glass) is falling in the Humu‘ula Saddle area. Seismic monitoring detects tremor (high rates of earthquakes) in the location of the currently active fissures. This indicates that magma is still being supplied, and activity is likely to continue as long as we see this signal[2].

Figure20 is shown Lava over roads in Leilani Estates as seen from the intersection of Leilani Street in May 25, 2018. **Figure21** is shown Lava over ran to town in 2018. That was just four years ago.

And then the volcano eruption of Mauna Loa restarted to become active again.

Figure20. Lava over roads in Leilani Estates as seen from the intersection of Leilani Street in May 25, 2018[1]

9. Summary

There is a need to study abroad so that we can learn about the earth as if it were our own skin.

Figure21. Lava over ran to town in 2018

The significance of studying at the University of Hawai‘i is that there are many such teaching materials. I would like to make the spirit of aloha the framework of program construction by visiting the site and interacting with many people. A civil engineer must be a designer for the people out there. Artificial intelligence technology needs to be designed with a feeling to help humans. Hawaii gives us many hints. So we have to study English more. Japanese technology is second to none in the world when it comes to ingenuity. It is most important for each and every one of us to have a purpose and reconsider opportunity in Hawaii. This KCCT Research Report may be my final personal opinion before our college was incorporated on 04/01/2023. And running this program, I may be the pioneer as first alone. I must do preparation of the Intelligence Earth Science Program.

Acknowledgments

Finally, the author wishes to express gratitude towards all Hawaiian staff and person related to this publication. There is appreciation for all people in Hawaii, too. Heart-filled thanks for everyone once more. In particular, I would like to thank the staff of the University of Hawai‘i for their cooperation in editing through peer review. We also interviewed a professor at the University of Hawai‘i. In addition, I was introduced to the graduate student involved. Here we express our gratitude.

REFERENCES

1) CHRISTTIE WILSON, LEE CATALUNA, MICHAEI ROVNER ; 「FIRE ＆ FURY -35 years of eruptions at Kilauea-」, Honolulu Star-Advertiser, ISBN 978-1-949307-10-8

2) https://www.usgs.gov/volcanoes/mauna-loa/volcano-updates