

Okayama Prefectural Tsuyama High School

SSH Project

Sixth Annual U.S.A. Science Camp



Mar 2-9, 2019
San Francisco, Boston, Washington D.C.



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3/2 San Francisco
California Academy of Sciences
バックヤード見学



3/2 San Francisco
California Academy of Sciences
研究者とのディスカッション



3/4 Harvard University Main Campus



3/4 Massachusetts Institute of Technology(MIT)
見学および大学生とのディスカッション



3/4 Massachusetts Institute of Technology(MIT)
講義室にて



3/4 Massachusetts Institute of Technology(MIT)
日本人留学生による講義



3/5 Harvard University Medical School
研究者より研究内容についての講義



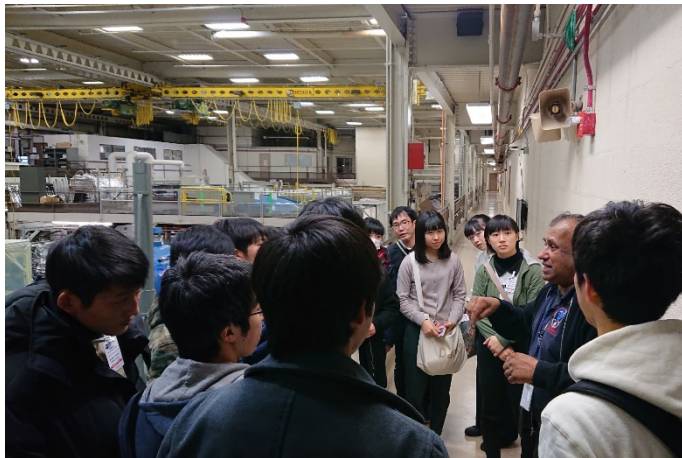
3/5 Harvard University Medical School
研究者より研究内容についての講義。
その後、研究室や病院施設等を見学



3/5 Harvard University Medical School



3/6 Smithsonian National Air and Space Museum



3/7 NASA Goddard Space Flight Center
研究者より宇宙開発等に関する説明



3/7 NASA Goddard Space Flight Center
研究者より天体と観測技術に関する講義



3/7 NASA Goddard Space Flight Center
研究者から人工衛星について説明



3/7 NASA Goddard Space Flight Center
研究者から管制室について説明



3/7 Smithsonian National Museum of
Natural History



事前学習(GSO)



事前学習(GSO)



出発式

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I 研修の概要

1. 目的

本校 SSH の研究開発課題である「未来を切り拓くトップサイエンティストの基盤となる‘Vision’, ‘Grit’, ‘Research Mind’の育成」に向け、海外に出向き、世界でのトップレベルの大学において研究者・学生との交流を行う。また世界トップレベルの研究機関・研修施設において本物に触れることで、自然科学研究に対する意識を高揚し、国際的な視野を広げるとともに科学的コミュニケーションの実践能力を育成する。これらを通して研究者になるための明確な目的意識を育てる。

2. 研修先

アメリカ合衆国

サンフランシスコ …カリフォルニア アカデミー オブ サイエンス
ボストン …ハーバード大学, マサチューセッツ工科大学 (MIT)
ワシントン D.C. …スミソニアン国立自然史博物館・国立航空宇宙博物館,
NASA ゴダード宇宙飛行センター

3. 参加者

2年次生選抜生徒 16名 (男子 10名, 女子 6名) および 引率教員 2名

生徒	2年次生	理数科	植田 祐一郎	俣野 翔太	大谷 陽希	高木 麻未
		普通科	金光 真季	東明 一太	吉原 和哉	今西 亮太
			岩根 弘和	加治 佳樹	小林 綜太	田村 郁人
			西村 玲	有本 亜未	大林 晶	高橋 風花

引率 村上 貴澄 (海外研修委員長・英語) 下山 卓士 (2年次主任・化学)

4. 事前学習・事後学習

- ・事前学習：第1回定期考査終了後より、毎週1回実施。
月1回は岡山県のGSO事業による外国人指導者4名による指導を行う。
- ・事後学習：レポート作成、プレゼンテーション資料作成、および生徒への発表を行う。

5. 日程

平成31年3月2日(土)～3月9日(土) 6泊8日

月日 (曜)	地名	現地時刻	実施内容
3/2 (土)	学校 発	12:30	貸切バスにて関西国際空港へ (途中SAにて昼食)
	関西国際空港 着	16:30	UA034 空路にて出国 (機内食, 機中泊)
	関西国際空港 発	19:20	(日付変更線通過)
	サンフランシスコ 着	12:05	サンフランシスコ国際空港着 入国手続き後, 専用車にて移動 (途中昼食)

		16:00 17:00 18:00 20:30	California Academy of Sciences 研修 施設見学, 研究員による講義と交流 California Academy of Sciences 発, 専用車にて移動 ホテル ウィットコム着, 市内にて夕食 研修のまとめ サンフランシスコ市内泊
3/3 (日)	サンフランシスコ 発 ボストン 着	6:00 8:30 17:05 19:00 21:00	ホテル発, 専用車にて空港へ (空港にて朝食) UA768 空路にてボストンへ ボストンローガン空港着 専用車にてホテルへ ホテル ジ イン アト ブルックリン着, 市内にて夕食 ミーティング ボストン市内泊
3/4 (月)	ボストン	8:00 9:30 13:30 18:00 20:00	朝食後, ホテル発 (バスにて) ハーバード大学メインキャンパス着 ロボティクス研究に関する講義と現地大学院生達との相互の 研究発表と質疑, 交流 MITにて研究室訪問 Yoshinaga 研究員の講義, 研究室見学, 交流 生徒による現地学生へのアンケート調査実施, ホテル着, 市内にて夕食 ミーティング ボストン市内泊
3/5 (火)	ボストン	9:00 10:00 12:00 13:00 16:00 18:00 20:00	朝食後, ホテル発 (徒歩にて) ハーバード大学ロングウッド校着 講義聴講 昼食 (学内にて) 研究室訪問および講義, 交流 ハーバード大学ロングウッド校発 ホテル着 市内にて夕食 研修のまとめ ボストン市内泊
3/6 (水)	ボストン 発 ワシントン D.C. 着	7:00 9:47 11:25 13:00 13:30	ホテル発 専用車で空港へ (空港にて朝食) UA525 空路ワシントン D.C.へ ワシントンダレス国際空港着 空港にて昼食後, 専用車にてホテルへ ホテル ホリデイ イン ワシントンキャピトル着 スミソニアンへ (徒歩) スミソニアン航空宇宙博物館研修 宇宙開発, 航空工学, 天文学からテーマを設定し, 調査

		18:00 20:00	同博物館発、徒歩にてホテルへ ホテル着、夕食（市内にて） 研修のまとめ ワシントンD.C.泊
3/7 (木)	ワシントンD.C.	9:00 10:00 12:30 14:30 18:00 21:00	朝食後、専用車にてホテル発 NASA Goddard Space Center にて研修 Science of Sphere において講義、施設見学 NASA 研究者による講義 NASA Goddard Space Center 発 専用車にて スミソニアン自然史博物館研修 生物学、地球科学、考古学からテーマを設定し、調査 ホテル着、夕食（市内にて） 研修のまとめ ワシントンD.C.泊
3/8 (金)	ワシントンD.C. 発	7:00 9:00 12:35	ホテルにて朝食 ホテル発、専用車にて空港へ UA803 空路にて、成田国際空港へ（機内夕食,朝食） (日付変更線通過) 機中泊
3/9 (土)	成田国際空港 着 成田国際空港 発 伊丹空港 着 津山高校 着	16:45 18:10 19:40 23:00	入国審査、荷物受取、税関審査 国内線チェックインカウンターにて搭乗手続き 全日空 2179 便 空路にて伊丹空港へ 貸切バスにて学校へ 解散式

II 研修報告（引率者より）

SSH 海外研修引率教員 下山 卓士（理科）

1. 出発まで

① 募集と選抜

1年次3月に説明会を実施，希望者は2年次4月にエントリーシートによる申し込みを受け付けた。生徒の関心は高く，約70名の生徒が説明会に参加し，最終的に22名の生徒がエントリーした。

選考は，エントリーシートと面接によって行った。面接は，英語科・理科の複数の教員によって実施し，日本語と英語で行い，科学研究に対する意欲とコミュニケーション能力を重視し評価した。これにより理数科4名，普通科12名，計16名の生徒が選ばれた。

② 事前学習

5月末から16名全員による事前学習をスタートした。事前学習は毎週1回90分を基本とし，引率予定者である英語教員と理科教員に加え，科学部で英語発表指導をいただいているMartina先生にも指導をいただいた。内容は，研修先であるスミソニアン博物館やゴダード宇宙センター，ハーバードメディカルスクールに関する事前調査とプレゼンテーション学習，英語コミュニケーション，グループワーク，MITキャンパスにおけるアンケート調査資料作成，しおり作成などを行った。

③ GSO (Global Science Okayama)

岡山県科学英語事業「GSO」を活用し，毎月1~2回，4名の外国人指導者に来校いただいて英語コミュニケーションの指導を行った。16名を4班に分け，各班に1名のGSOの先生についていただき，20分ごとにローテーションすることで，全員が毎回4人の講師による4テーマのコミュニケーション演習を行う方法で実施した。

2. 研修

3/2(土)出発，3/9(土)帰国の6泊8日の日程である。本校ではこの週が高校入試で生徒は家庭学習日となるため研修参加者の授業のロスが最小限で済む点，夏は他のSSH行事が集中しており実施が困難な点，などを考慮し，例年通り3月実施となった。

① 3/2(土)

【フライト】

昼に貸切バスで本校を出発。夕方，関西国際空港より出国。機体整備のため1時間程度離陸が遅れたが，無事出発した。

サンフランシスコ国際空港に着いたが，ここでも入国審査のゲートへたどり着くまで2時間以上待たされた。審査官の厳しい態度に不安を感じつつも，すべての生徒が無事に自力で通過することができた。

【サンフランシスコ】

アカデミー・オブ・サイエンスに1時間遅れで到着した。その影響で，予定していたバックヤードツアーの時間が30分短縮となってしまった。最初に，入り口近くのワニの水槽にて説明を受けた。続いて，米国有数の保有量を誇る標本室を見せていただいたり，剥製を作製する部屋に入らせていただいたりした。標本や剥製の採集から作製に至る過程や，使用する薬品等についての講義であったが，最初こそ難解な専門用語と英会話の速さにたじろいだものの，慣れてくると生徒から次々と質問が飛び出し，非常に質の高い学びとなった。生徒達は自分たちが質問をすることで，より深い内容を伺い知ることができるだけでなく，自分たちの関心の高さを相手に伝えることができる，ということを改めて感じた様子であった。

② 3/3(日)

【サンフランシスコからボストンへ】

ボストンへ移動するため、サンフランシスコ国際空港へ。米国で初めての搭乗手続きとなったが、生徒たちはスムーズにチェックインを終えた。ただ、セキュリティチェックではジャケットと靴を脱ぐよう指示され、日本とは違う警備の厳しさを身をもって学んだ瞬間であった。

ボストンには予定通り到着したが、5時間以上のフライト及び3時間の時差に疲れを隠せなかった。雪はなかったが、サンフランシスコより一気に気温が下がり、同じ国でありながら気候の違いに戸惑うなど、改めてアメリカという国の大きさを実感した様子であった。夜は次の日の研修に向けて入念にミーティングを行った。

③ 3/4(月)

【ハーバード大学研修】

朝起きると、雪が積もっていた。大学への移動に支障が出るかと思われたが、想像以上にスムーズに移動することができた。ハーバード大学のメインキャンパスでは、現地の大学生からクリティカルシンキングの講義を受けた。日本とは違う教育の考え方に触れ、日本の教育にもクリティカルシンキングを取り入れるべきだと考えるようになった生徒もいた。手加減のない英語での講義であったが、生徒達は負けずと質問を繰り返し、同行していた現地ガイドの方も感心しておられた。また、講義の前後の時間を利用して、ハーバードの学生を対象にしたアンケート調査を行った。その一番の目的は、アンケートを使って自分から学生に話しかけ会話をすることにある。断られたり、うまく説明することができなかつたりしたこともあったが、ほぼ全ての生徒が積極性を持ち諦めずに何度も話しかけることができた。

【マサチューセッツ工科大学研修】(以下 MIT)

昼食前には、現地の学生の案内で MIT の内部を見学した。学内のいたるところに研究成果や遊び心のある作品が展示されていた。また、研究内容についての説明を受けたが、生徒達はここでも積極的に英語で質問を繰り返していた。

午後は、吉永宏佑先生の講義を受けた。ご自身が留学に至った理由や、そのために必要だったこと、MITでの日常生活、日本とアメリカの博士号についての価値観の違いなどについて語ってくださった。また、専門の材料化学についても説明していただき、生徒にとっては自分達が日本で抱えている価値観が絶対的では無いということに気づき始めたようである。

④ 3/5(火)

【ハーバード大学研修】

午前中はハーバード大学ロングウッド校(メディカルスクール)で講義を受けた。医学部の永井潤先生や公衆衛生大学院の木野志保先生など、世界最先端の研究施設、医療現場で研究に携わる方より説明を受けることができ、世界でトップレベルの学生たちがどんなモチベーションで学んでいるかがわかった。講師の先生方に共通していたのは目的意識の高さと行動力である。「留学は目的でなく、手段」という忘れがちな大原則を生徒は再確認し、自らのキャリアをおぼろげながら描くことのできた生徒も多くいた。ここでも質問は止まることなく、その後の昼食時間や学内の移動時間も利用して議論を交わしていた。

午後は、同校にて引き続き先生方の案内によってハーバード大学の提携病院を訪問し、交流・研究紹介・実験デモ・講義等を受けた。日本と違い、研究室の壁が無い環境での研究環境は、異分野の研究者が自然に交流し意見を交わすことができる雰囲気であり、生徒たちは自分の専門を大切にしながらも、他分野を専門とし価値観も異なる研究者からの指摘の大切さを感じたようである。

⑤ 3/6(水)

【ボストンからワシントン D. C. へ】

アメリカの首都ワシントン D.C. へ移動。搭乗手続き、セキュリティチェックも慣れたものだった。悪天候であったのか、飛行機は今回の研修中で最も揺れたが、ワシントン D.C.には予定通り到着することができた。

【スミソニアン国立自然史博物館研修・国立航空宇宙博物館】

午後はスミソニアン国立自然史博物館研修及び国立航空宇宙博物館で研修を行った。多くの生徒が楽しみにしていたようで、事前学習で興味関心を強く引いた展示物目指して一目散に駆け出した生徒もいた。ライトフライヤー号や骨格標本、貴重な鉱物等、生徒は各々の興味のある分野を見学できた様子である。英語で書かれた説明書きをむさぼるように読む生徒の姿が非常に印象的であり、学びの本質を感じることができた。ただ、一部の展示スペースが改修の影響で閉鎖されていたのが唯一の心残りであった。

⑥ 3/7(木)

【NASA ゴダード宇宙飛行センター】

NASA ゴダード宇宙飛行センターの方から、施設内を案内していただいた。衛星を組み立てている現場や、作成した衛星の強度等を試験する施設、さらには管制室の見学をさせて頂いた。専門用語を交えた英語での説明ではあったが、これまでの研修を通しての慣れもあり、生徒はほぼすべての内容を聞き取れた様子であった。また生徒はメモを取りながら熱心に話を聴き、次々と質問が飛び出したが、それにひとつひとつ丁寧に答えてくださった。研究者の方々と交流ができる最後の研修であったが、今までの経験から学び成長した生徒の姿を見てとても誇りに感じた。

⑦ 3/8(金)~3/9(土)

【帰国】

以前のこの研修では、帰国時に機材トラブルなどで予定が延期された回が多く、非常に不安感があった。無事に飛ぶことを祈りながらワシントンダレス国際空港に向かった。出国の手続きを済ませゲートに向かうと、飛行機は定刻に飛んだ。日付変更線を越えて成田空港で乗り継ぎ、さらに伊丹空港から2時間半バスに揺られ、津山へ無事到着できた。さすがに疲れが出たのか、ほとんどの生徒は静かに思い思いの時間を過ごしていたが、その顔にはこの研修をやりきった充実感と達成感が浮かんでいた。

3. 研修を終えて

過去の研修のよい部分を引き継ぎながら新しいことにも挑戦した研修であった。ボストンでは大雪に見舞われたが、幸いにも大きなトラブルや体調不良者も出ず、この上ない形で終えることができた。関係機関の方々や研修先、また先生方や保護者のみなさまのご尽力に心より感謝を申し上げたい。

世界最先端の研究施設、研究者、学生に直に触れることで、生徒たちの視野は大きく広がった。また、数々の人との出会いが、彼らにとって学ぶことの意味や自らの将来について考える機会となった。特に生徒たちが感じていたのは、今回出会えた方々の行動力である。日本人は特に遠慮や謙遜を美德とする文化があるが、それは世界では通用しないことが多い。今回講義をしてくださった方々は「こうしたい」という強い意志を持ち、まずは「やってみよう」と行動を起こした人々である。特に日本人留学生の方々は共通して「英語をうまく話せなかったけれど、積極的に話すようにした」という経験をお持ちであった。失敗が許されない昨今の日本の風潮だが、失敗を恐れずに行

動した先に本当の成功が存在することを、生徒達は肌で感じてくれたと思う。

同時に生徒達には、日本の優れた点にも気づき始めていた。日本を飛び出してアメリカに行ったからこそ気づき、実感したのであろう。そしてこの感覚は、研修を通じて英語でアメリカの人と対等に会話をしたことで築いた自信の上に育まれてきている。

この研修はもちろん、アメリカに滞在した1週間の経験のみならず、約1年前から GSO で準備してきた内容も全て含めてのものである。最初は、英語が聞き取れない、英語で話せない、困惑した生徒の姿が印象的であった。しかし、多くの先生方にお世話になり試行錯誤を繰り返す中で、彼らはその根底にあるものに気づいていった。それは、英語で会話する「勇気」がないということだった。完璧な英語で話さなければならないという固定観念といってもよいかもしれない。「日本以外の留学生は、英語の文法は滅茶苦茶でも、とにかくしゃべる」という MIT の吉永宏佑先生。『自分の考えを話さないダメだ』と教官に言われた」というハーバード大の木野志保先生。お二人の言葉が示すように、様々な文化が存在する世界の中で活躍していくには、自己表現が必要不可欠である。

アメリカに着いても、全員がすぐに英語で会話できた訳ではない。現地の人と会話を楽しむ仲間を、複雑な思いで見ている生徒もいた。話したいけれど、なかなか話せない。その葛藤の末、一步を踏み出す姿。周囲から見れば、小さな一步かもしれない。しかし、本人の中では大きな決断だったに違いない。現地の人との会話を終えた生徒の顔には、安堵とともに大きな自信があふれていた。

人生は決断の連続である。これからも人生の様々な場面で決断を迫られることだろう。迷ったときには、今回の研修を思い出して欲しい。これだけ努力した自分がある。これだけ勇気を振り絞った自分がある。しっかりと次の一步を踏み出していこう。



Ⅲ 生徒レポート

Go Abroad, Go Forward

Ryota Imanishi

Broaden my horizons

I went to the Harvard Medical Center on the third day of this trip. I was impressed with the lecture about public health. It is a study where we research how to prevent people from being sick. Before I went to America, I was interested in medical care, especially in medicine, but by listening to the lecture I was also interested in public health. Talking with the researchers there gave me another choice for my future.

Also the researchers said that in the West, especially in America, the people think that the balance of work and life is very important because they can have a good performance with it. “We have a lot of holidays spending time with our families”, they said with a smile. Thanks to visiting there, I found a new goal to achieve in the future.

Sharing the values

I feel that education in America is different from the Japanese one. Children in America are interested in various things and ask many questions. Even though Japanese children are interested in things around them, they seldom ask questions, especially in public. At the Smithsonian National Air and Space Museum, I saw children in America join a workshop and ask a lot of questions in front of many people. They were very little, maybe 3 or 4-year-old boys! There is an environment that people can ask questions easily in America.

This difference in education means that values in America are different from Japanese ones. In America, the people respect individuals, so they ask many questions when they cannot understand what others' say and people consider it common. In Japan, the people respect the group, so they try to go along with others and they avoid wasting other people's time asking questions. I cannot say which culture is better because both of them have merits and demerits. However, I am sure that Japanese people should understand there are different cultures in the world. In order to succeed overseas, we Japanese should respect our values and other cultures.

To Express Is To Live

Fumito Tamura

Firstly, I could not have such a precious experience only by myself. I am grateful to teachers who prepared for this study trip and taught English and communication to us at GSO, parents who allowed me to take part in it and always supported me, friends who spent time in this completely different culture together, and all the others involved in it.

My way of thinking has gradually changed since I went to the U.S. Before I visited there, I was not concerned with things around me, and hardly said my opinion to others because I had thought that I was not worth having opinions if someone objected to my opinion. However, I found it wrong in this study trip. I will state about my experience there.

In Boston and Washington D.C., we saw a lot of poor people who lived on the street and showed a scene of discrimination. A man looked at us and said “Ni-Hao!” in a very big voice many times. I wondered why such a country had developed dramatically and became the economic and technical center of the world. I found one of the answers in Harvard University. In the class there about “Critical Thinking”, I was very shocked. I could hardly hear what the teacher said, and my friends asked a lot of questions and discussed with her. In medical school, a researcher came from Japan said “I have had trouble with students and professors here. Students in Harvard always say their opinions clearly while I couldn’t state my opinion. The U.K. and U.S. have a very different culture compared to Japan.” In addition, laboratories there were very open and everyone could share information, even people in other fields.

I thought what makes America strong is “expression and communication”. At the same time, I thought these are things most Japanese want to avoid. However, I think it is most important for us and we cannot grow in this spreading society without them. I learned that criticizing someone’s opinion is not attacking him, or rather, it is necessary to make our opinion and mind strong or perfect.

As we state our opinions, we must take responsibility for our behavior. In Japan, many people avoid doing it and do not persist on their ideas. Finally, we stop to think what we have to think. I don’t think Japanese are “shy”, but “do not have things to say”. Of course, I am one of them. However, we must change such mind at first. I also think the reason why we study is to express our thoughts and understand others’ opinions. What we need is to learn about things happening around us, in the world, and to think carefully and act without depending on others. We must be independent from anyone.

The Things I Study And Feel In America

Kazuya Yoshihara

From March second through ninth we went to San Francisco, Boston and Washington D.C. and visited some facilities, museums, and universities. Throughout this project, I had meaningful experiences I can't do in Japan and I saw and felt wonderful exhibits. In this report I will tell you about things I have learned in this project.

When we visited Harvard Medical School, I talked with some researchers studying there. I was interested in the drug situation in America and public health. These days, the demand of drugs is increasing around the world. Medicine made in Japan is highly trusted. But Japanese pharmaceutical companies can't make huge profit for following reasons. First, Japanese companies don't have any route to sell their drugs like American and European companies. Overseas operation of Japanese companies started too late. Second, the people who engage in producing drugs and money gather in Boston because there are a lot of companies, universities, and research institutes. One of the researchers said that these are some of the reasons why they study here. I'm interested in producing drugs, so this idea is very surprising and I would like to change this situation. The researcher who told us about public health studied it not only in America but also in England and Japan. She researched the relation of income and the gap of medical behavior. She explained the differences of medical expense support systems among Japan, America and European countries. It's common for American people to pay all of the medical expense, so The Patient Protection and Affordable Care Act, which is called "Obamacare", is a breakthrough for them. I was impressed with the medical approach before people get sick.

My best impression of this study trip is the warmth of American people. At stores, on avenues, and even on plains, most of American people were kind and friendly to me. They seriously listened to my poor English and tried to communicate with me. Because they are considerate people, I was able to speak English without hesitation and shame. At least in my life, I have never felt like this in Japan. In my opinion, these warmth of Americans make themselves self-confident and aggressive.

Throughout this trip, I recognized how important it is being proud of myself and having self-confidence. All of the people who I met are filled with confidence and kindness. I realized what is important is to have goals and dreams and by the students. Finally, I would like to thank the teachers who planned this project and took us to America, my parents, who prepared for this trip, and my 15 friends who helped me. I want to try anything I am interested in and change my life with this experience.

My Precious Experiences

Fuka Takahashi

During this study trip, I realized it was important to see everything and live without bias. In order to do that, we should be exposed to different values to widen our views. However, especially Japanese people who live in an island country which isn't a multi-ethnic nation find it difficult to do so, because we have a limited angle or viewpoint. When I visited MIT, I was surprised to see a lot of students who were from various countries. In addition, they discussed everywhere they wanted to do so with us at a table or in the hall. This might be great opportunities for them to accept diversity and live an enriched life. That means, we should interact with a lot of people who have another view to make our life richer and more flexible. To do so, I want to talk with many people not only Japanese but also foreigners, and try everything positively.

I could break a vague preconception —America is outstanding— through this science camp. For example, in research, the relationships between professors and researchers in America and Japan are contrasting. The relationship in America is equal. In other words, researchers can easily give their honest opinions to professors. Beside that, American research teams focus on individual ability. Therefore, America has uniqueness. As for in Japan, professors have authority. Thus, researchers cannot easily express their opinions. However, the Japanese attention that values 'wa' meaning 'harmony' helps them to achieve the goal together. Both styles of research is not wrong but essential for the technological advances in the world. In summary of a medical lecture in Harvard, it is strong research minds of university students, worldwide network, national donation and improving of venture-capital companies that Japan needs to develop in Japanese science.

While I listened to researchers, I felt strong passions of them. They seemed to have confidence in their own research and seemed to be excited about the future that they would create. And their excitement made me excited. Thanks to them, I felt the true significance of study, realized the importance of having pride in myself, and started to be interested in working as a researcher.

Finally, I want to express my greatest gratitude to everyone who are concerned with this science camp. Because of being impressed by seniors who had joined this trip, I applied for this program, and my good friends motivated me to work harder. And through GSO, I realized that the disgrace is not speaking wrong English but being silent, being afraid of making mistakes. I want to be a person who can move someone's heart like them who have a cause and moved me. I never forget this most painful and richest experience, and I'm eager to continue to grow.

Critical Thinking

Hirokazu Iwane

My first trip to the United States of America was very fascinating. On the third day in the training trip, we went to Harvard University and received an interesting lecture by Madeline. The lecture changed my mind.

~Her lecture~

She is studying about “Critical Thinking” at Harvard University. I had never heard about “Critical Thinking” before then. I think almost all of Japanese high school students do not hear about it. It is a way of thinking to get correct solutions by considering and analyzing problems properly. At first, I regarded “Critical Thinking” as criticizing problems which occurs. However, according to her lecture, there is a big difference between “Critical Thinking” and criticism. The latter means to find fault with problems and assess them, whereas the former means to discuss, accept opinions which are different from my opinion, and solve problems.

She also advised us to be a critical thinker. Firstly, you have to acknowledge bias and preference. I think this is very important in our daily life. If you force your views on others without considering them, you will not be able to get a good solution. That does not mean you should refrain from giving your opinions. Secondly, when you have critical opinions, expressing the opinions or keeping them in your mind depends on the time and place. You have to consider whether the critical opinions make situations better or not.

~My opinion~

I have learned it is important to say my own opinions in “Critical Thinking” and that Japanese people lack ability to express themselves and give their opinions. According to her speech, even young children have “Critical Thinking”. We should learn from them. If you give your own opinions without being ashamed and hesitating, you will be able to get better answer. However, as mentioned above you have to be careful in some situations. Under the consideration of them, I want to be a critical thinker and persuade friends to be one. If we can, our life will become better.

Studying Abroad At Young Age

Yoshiki Kaji

We visited Harvard Medical School and two graduate students told us about the importance of studying abroad. They both said, “You have to study abroad while you are young.” I was impressed with what they said, because I had never wanted to study abroad. However, after this trip, I gradually understood why they said that. Now I want to tell you what I thought about why we have to study abroad at a young age. The answer is, by studying abroad at a young age, you can make a better future. This reason has several points of view.

Firstly, we, young people have potential and will make the future. So, it is important to study abroad and see the differences between your home country and other countries. Let’s talk about my experience. In this trip, I noticed that Japan and America are very different in that America has better ideas and educational institutions and research work. I want to be a teacher, so I want to adopt American ideas of education in the future to make Japanese education better than it is now. Like this, by comparing good points and bad points between various countries, you can change your ideas and make a better future.

Secondly, by studying abroad at a young age, you can learn the real and actual situations and problems in foreign countries, and you can deal with the problems in the future. In this trip, I saw many homeless people. Before I went to America, I had heard that American society has economic disparity, but I had never thought it was so serious a problem. However, when I actually went to America and saw many homeless people, I knew how terrible the problem was. Through this experience, I became aware of the issue of economic disparity. I could not understand how terrible the situation was, if I had never been to America and seen homeless people. Like this, studying abroad teaches us the real situations of problems in foreign countries. As I mentioned above, young people will make the future, so we have to know the problems in foreign countries in order to deal with these problems in the future.

There is a saying “Strike while the iron is hot.” As people get older, they lose their potential. I say it again, we, young people have potential. We make the future. It is necessary for us to study abroad to make better future and a better world.

No Teaching, The Show Is Everything

Ichita Tomei

A week of studying in the US made me realize many things. I knew that I can learn a lot and yes, it was true I could learn a lot but there were things that I did not expect, both good and bad. First, the good one, is the lecture. A student in Harvard University, Madeline, taught us about critical thinking. This way of thinking is that you should see the thing you meet from various kinds of viewpoints. You can think about side effects from the perfect situation. That reduces your mistakes you may be making and you can deal with the problem wisely. Actually, I used to think things from many ways, but I didn't know exactly how or even why I should do so then she taught me what I wanted to know. Now this way of thinking is always in my head. That lecture was the very best study in that trip.

Next, the bad thing and it may be said about all this trip, is about using Japanese. Almost half of the lectures were held with Japanese. I cannot understand why I had to listen to Japanese in the US, basic conversation with friends in the hotel is ok but did we have to meet Japanese in a foreign country? We can meet Japanese in Japan!! And they taught us about how important studying abroad is and kind of these things. Of course, that lectures were amazing and taught me many things including specialized knowledge that is hard to know in Japan. So, I didn't mean to say the lecture was terrible. I think we can hear them even in Japan. We didn't need to hear all these there.

And at last, I would like to say thanks to my parents, teachers and my friends. Thanks to them I could fully enjoy my trip and learned so many things. It is hard to teach you what I learned but I can tell you what I saw, so if you want to know why, you should go abroad and you will see...

My Visit To America

Sota Kobayashi

Why don't you speak some foreign languages? Maybe you will answer "Just because everyone speaks his or her mother tongue. If I don't speak it, a lot of people are unwilling to listen to me." Or "There is no special reasons."

Now I want to ask you whether you can use a language you have studied or not. If you can get good marks on English tests, you may be under the mistaken impression that you can speak, write and listen to English. However as you have never seen such a person, it is a complete illusion! (Actually, I used to be under the illusion.)

When I arrived at San Francisco Airport, I was confused. I couldn't hear what others were saying. I had listened to English text CDs, but I couldn't distinguish the span between words even though I was listening very closely. I thought to myself, "I should have been better at listening." So I realized what I had listened to was different from the real English.

After that, I realized that I had not spoken English. One of my purposes of the visit was to speak English. So I was eager to talk to someone. After a little hesitation, I managed to talk to a back packer. And just at that time, I was confused again. The greeting was smooth. It was systemic. But the next words wouldn't come out. I knew a lot of words and grammar because I had studied them, but when it comes to the real conversation, I couldn't use it at all.

"Can you use languages you are studying? If you only study it, your answer is probably "No". It is your armchair English. The most important thing is to actually use it in your real life. The more you use English, the better you will become. So why don't you speak English?"

During my stay, I felt a lot of differences between Japan and America. One of my biggest confusions was that there were people with many different ethnic backgrounds. There were Asian, African, European, Hispanic and so on. First, I was very confused since I see less diversity of people in Japan. But, as time passed, I came to realize that all of them are the same. In spite of the difference in colors of their skin, they speak the same language, they were kind to us and they live their lives. So I can't understand why there are racial discriminations. I want all of people to see or focus on what we have in common regardless of the differences in skin color.

This visit made me think difficulty of speaking a second language and find a piece of solution to some big problems.

American Character And Questionnaire

Rei Nishimura

• American people's character

I felt they were friendly and sociable. They often said "Hello" or "Hi" when I had eye contact with them. For example, I was spoken to by a cashier while I was buying presents for my friends in a supermarket. She said "Hello how are you?" I was surprised and I answered "I'm good." After I thought "This is America". I think they value a little communication like this and want their lives to be fun.

Through conversation with them, I felt they are positive in their thinking, so they do not mind a little thing. In other words they are laid back. They are not ashamed, so they ask a lot of questions as soon as they have questions. It is important for Japanese people to think like this.

They respect religion more than Japanese people. One of them believe in Buddhism. I realized again that there are many different kinds of people in America. I felt they emphasize individuality more than Japanese.

• Questionnaire: How much do you like yourself? Why?

I felt they understand enough about the good point, so most of them answered between 70%~100% and over 100% in this questionnaire. However one person answered 0% and she said, "0% because I can still grow up and evolve more". I thought what a good way of thinking. I think it is necessary for Japanese people how to think like this.

I would like to be able to think like this in the future.

I asked one more questionnaire in this trip. It is "what do you think about Japanese people" They also think that Japanese people are polite, but they think they are shy and don't have an opinion. American people have their opinions clearly. This is the difference between American people and Japanese people. We must change this image and difference, so I want to have clear opinions and ask a lot of questions actively in daily life.

What I Got Through This Study Trip

Sho Obayashi

On March 2, 2019 we finally arrived in the U.S. I was impressed that buses, width of the road, foods and so on are much larger in scale than Japan. I couldn't help getting excited at the view from the bus.

-The difference between the U.S. and Japan-

In Boston, many people ignore traffic light when they cross roads. And I saw people talking on their cell phone on the train. I found that what is thought as a common rule in Japan is not same in the US. In character respect, there are some differences too. We took a lot of lecture by researchers in this trip. Most of them told us difference between American and Japanese. American students have a clear vision and study hard to realize it. In MIT, there were blackboards on some wall so that students can have discussions at any time. I thought the environment to study is very important. Besides this, Americans love themselves, have confidence and are active. For example, when we did a questionnaire, they answered they love themselves. I expect few Japanese people answer as Americans do if we ask them the same question. Actually, I don't have confidence myself. So, I respect them and I want to be a positive person like Americans. In addition, Americans are very friendly and they even talked to me at the cash register. I enjoyed talking with them without being nervous because they talked slowly and again and again until I understood their English.

-In Harvard Medical School-

For me, the lecture at HMS was the most interesting. When talking a laboratory tour, we heard about immune research. I know immunology well because I major in biology, so I could understand what the researcher said. Therefore I realized the importance and of having many knowledges. I believe we get a new point of view by knowing something. I wanted to know about it more, so I asked him some questions. As a result, I gained confidence to talk more actively.

We talked about the significance of this study trip at the last meeting. There is almost no opportunity for this kind of discussion in daily life. Everybody shared their own opinion and made it more deeply. Eventually, we couldn't find the answer, but by knowing different ways of thinking, I got the ability to think about things from other perspectives. This is my growth point through this trip.

Finally, this study trip was a great and precious experience. I want to thank you for preparing this project.

The Experience In America

Ami Arimoto

In this study trip, I experienced the proverb “A picture is worth a thousand spelling”. Before this study trip, I had an impression that America is the most modern in all areas. However, I actually walked through the streets of America and I saw old buildings, old subway, many homeless people and so on. Especially, as for old subway, that is what I was most surprised by. Even though many people use it every day, the ticket gate remained broken. It was very different from the subway in Japan. I only searched how to get train, so it was unexpected and I was very surprised.

Through this, I learned that it is important to actually experience. I found that by looking with my own eyes, I learned a lot of things better than I could search or hear.

On the fourth day, we went to Brigham and Women’s Hospital. My dream is to be a nurse, so I was looking forward to learning about American medical science. I was very glad to be able to attend a lecture about medicine.

In the hospital, I talked with researchers from Japan. They said that they did not want to study abroad and did not like English, but people around them recommended they study abroad. I was so surprised, because they had great courage. If I were in their place, I would not make decisions like theirs. I learned the importance of actively grabbing opportunities from their stories. Therefore I want to live consciously of positive behavior.

Having this experience with people with high awareness has broadened my horizons. I had such a precious experience thanks to my parents and teachers.

I deeply appreciate this and will not forget this. I also want to tell many people about my experience and want everyone to know about world. However, it is difficult to tell them all of my experiences. So I also want everyone to go abroad and actually see the world themselves.

Importance Of Actual Experience

Yuichiro Ueda

I think the Smithsonian Museum of Natural History is one of the greatest museum in the world. I went to this museum and I understood why America is good for learning.

Smithsonian Museums are free to enter because this museum is run by donations. It is important to be free because children can enter easily. Smithsonian Museum exhibits various kinds of things. Being able to get knowledge about history, such as science and aviation, from an early age by looking at the tools actually used can gain a great advantage in studying after that. Smithsonian Museum of Natural History also exhibits materials to study at school. Therefore, I think America is a wonderful environment where they can study more deeply.

I had heard that the United States is a country that respects individuals before the training and I actually went to the United States and understood the meaning. It is probably the best environment for anyone who wants to study. I think that the Smithsonian Museum is one example as it is not a place where everyone is given equal opportunities but it is a place where they can get opportunity if you intend to learn. Before I went to America, I only read about it in books and listened to others stories. I only had the impression that “the culture and ideas are different.” One of the things I was excited about going to America for was to be able to feel this idea. However, when I actually went and experienced the environment this impression became much stronger. I wrote that it was important to visit America because I went to America and experienced culture and the idea.

I have learned so much and I feel that I have changed after I came to Japan before I went to America. Importance of “self-directed.” I was made to think strongly in this training that it was important to face to study and to actually experience.

What I Thought In The United States

Shota Matano

<Firstly>

We had the oversea training in the United States from March 2nd to 9th. I would like to write about what I thought there.

<What I thought about American Students>

While we were taking a bus to Harvard University, I found a man using his iPhone. At first, I thought he was checking his Twitter or Facebook. However, he was checking his dictionary. I was very surprised because I had thought that American students are freer than Japanese ones are. I guess that they are actually free, but do what they have to do. I once heard one of my teachers say, "University is the summer vacation of your life!" If the Japanese think that way, Japan will be left behind the other countries.

<What I thought at National Air and Space Museum>

I would like to tell you the quality of the exhibitions. NASM has hundreds of airplanes, space crafts, missiles, rockets, and so on. Surprisingly, almost all of them are the original or the spares of the machines that are working today. In addition, the design of the exhibition was wonderful. There were a lot of illustrations and devices enabled us to understand the explanations more easily. What impressed me most was the Soyuz and the Apollo which are connected to each other. As you know, the United States and The Soviet Union had an intense space race. They even threatened a nuclear war. However, NASM, which is an American museum, has both country's space crafts. It is so interesting, isn't it? I think science is a property that all human beings can share.

<What I thought about Smithsonian Institution>

I think that the most peculiar point of the Smithsonian Institution is its fund. It is fully covered by government money, donations, and the profit of the museum shops and publications. I would like you to focus on the donations. I guess there is a culture which encourages academic activities in America. I believe this is the source of the progress of America.

<Lastly>

Taking this opportunity, I would like to say thank you to my teachers and my family.

Everyone Can Be A Challenger

Haruki Otani

On the first day in America, I was so excited when I saw the cultural differences from Japan. At the airport the staff were talking and laughing loudly, and at the store the clerk spoke to me with “How are you?” If I wanted to continue talking, I could even have a chat with the clerk, who was not my friend. Could such a thing happen on a daily basis in Japan? Besides, there were a lot of people with flashy appearances in the US and I was excited. “Here I don’t have to worry about being seen by other people like when I’m in Japan,” I thought. And now that I think about it, I feel that I didn’t see people who spoke in a whisper. I think American people are quite open with others and it’s very nice. However, some places are too open, for example the rest room stall door. In the restroom of the US, the area of the door was about one third of that in Japan, and the foot of the person in the stall next to you could be seen easily. Also, American people always smiled at me. The staff of the facilities, the store clerks, and even passersby, smiled when our eyes met. How nice they were! Everyone helped me with a smile when I was in trouble because I could not speak English well.

Since junior high I thought about studying abroad, but I’m first worried about that I can’t speak English well. This idea prevents me from deciding to study abroad. But I stayed in the US for a week and found that American people are used to talking with people who can’t speak English, and they are very kind to them. Of course I still don’t think I can speak English, but I managed to speak English in the US. One year ago I would not be able to do this. GSO and the short days I spent in the US have changed me a lot. The most important thing is to talk proactively. In other words, it is up to me!

Do you think that anyone can easily be a challenger? It is very difficult for us to always try to do things beyond what we can do. But if you act proactively, you can be a cool challenger. Even Japanese students who I met in the US didn’t go there in perfect condition. I can do it too, and I can be a challenger. This study trip showed me that I can do it! From now on, I will overcome many things that I think I can’t do in the future.

Bring My Experience To The Future

Mami Takaki

7 red lines, 6 white lines, 50 stars on blue. Do you know what that means? Yes, it is an American flag, that is, a star and stripe flag. The white is for purity and innocence, red for strength and courage, and blue for observance, patience and justice. These things were learned through prior study and GSO. As GSO had many fluent speakers, it was the best place for me to communicate in English. I did everything I could for about nine months, and my study trip in America started this way. It was a university visit that I had the biggest impression on me during this trip. We visited Massachusetts Institute of Technology (MIT) and Harvard Medical School (HMS). I had the opportunity to listen to the lectures of Japanese students who are studying at MIT and HMS. So I will introduce the words that I had left in the biggest impact on me, “working towards your own goals is what makes you grow the most.” I tend to be passive, and one of the goals was to be proactive on this study trip. I saw a lot of students working hard in MIT, HMS laboratory and common room. My mind was moved by them working towards their goals. I thought that I would try to move positively if I had a little interest in my daily study. I also would like to make an effort on a daily basis to towards my academic, burning their spirit of challenge. Also at MIT and HMS I thought that studying was good for me and people. It is fun to think that knowing new things will become your own flesh and blood. I thought studying was the same as eating.

The story changes, but what I felt for the first time in America is diversity. Diversity is the existence of a wide variety of different qualities. At MIT, we had local students guide us on campus. At that time, I passed a lot of students. By looking at students covered with cloth, Asian students, I lost track of where I was for a moment. I felt that there were students from different countries with different religions and cultures. In supermarkets and restaurants, Americans are very kind and friendly to us, who are clearly Asian. I thought that Americans who live together with respect for various differences are wonderful. Japan is a country with many disasters, and many people are victims of the Great Eastern Japan Earthquake (2011.3.11), the Kumamoto Earthquake (2016.4.16), and the heavy rainfall in Western Japan (2018.6.28 ~ 7.8). It is important to think of each other, to recognize each other, and to overcome difficulties. I think that diversity is the key to making people's lives happy.

I changed my way of thinking and thinking about various things through this study trip. I also noticed the pleasure of knowing new things. I would like to be as open-minded as Americans while being proud of my Japaneseness. I will begin to meet myself who has grown even further from the new self I met in America.

What I Felt In The United States

Maki Kanemitsu

I would like to introduce three reasons for studying abroad in the United States who experienced a major turning point in life what I learned coming to America and a message for us.

First person

The reason for going abroad from Japan is the shrinking of the domestic economy due to the declining population and the increasing number of pensioners due to the declining birthrate and aging population. English is very important in studying abroad. The sooner you learn, the better you are, and the less you can live the better. Overseas, you can build a network that exceeds work and age. Incorporate objective and negative opinions. As a motivation for studying abroad, there are times when you want to reset everything when you get frustrated, when you want to use English, or when you want to find yourself. He also taught me the difference between Japanese and American offices. As a feature of Japan, there is a reality that the pile that comes out is beaten in a spirit that is unity, delicate, vertical society and loves sum. On the other hand, in the United States, respect for the child in the meritocracy is a disjoint opinion. Then it's rough.

Second person

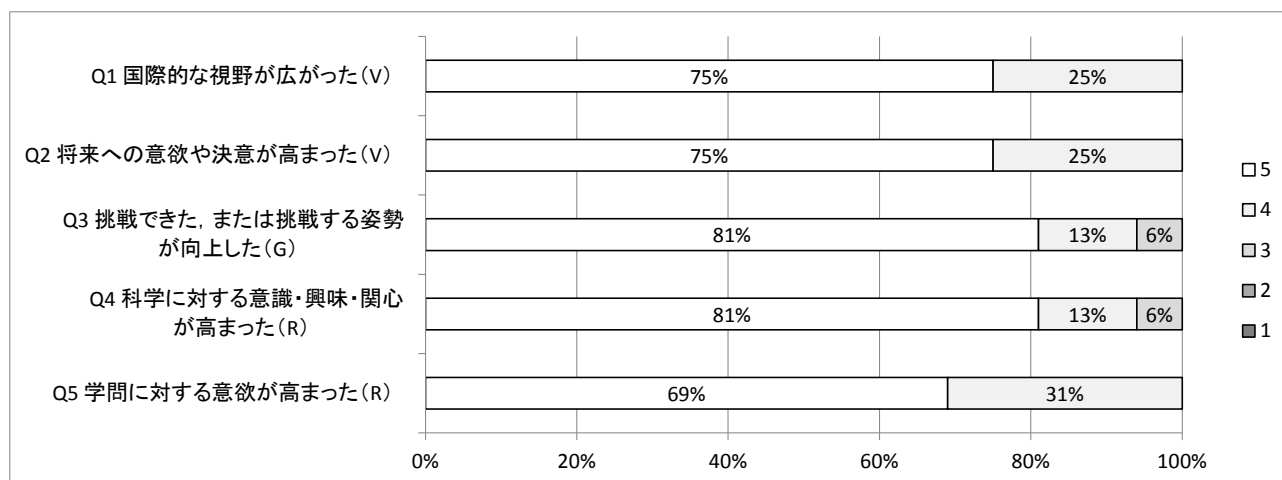
Although I did not receive a lecture directly from this person, I ate lunch together. She is the person who gave me the most impressive words in my future job. I dreamed of becoming a police officer and she was a doctor. So I asked a question. If there is your own judgment that this method will surely save people, I will ask you which priority should be given to you if pressure from the superiors or upper organizations for unreasonable reasons is given. Whether the career involved in your life or the person who is the only passing point in your life. She said she was in trouble (the patient in front of her). That's why it is most important to me now that I have to help is the patient in front of me, and if I do not save the people who are hated by the superiors, I become a doctor for what to do. She insisted strongly. The definitive word struck my heart strongly. I also want to complete my work with a strong will like her.

What I felt most strongly when I went to the United States was the difference in the aggressiveness of trying to relate to people. Japan is a culture that is humble, less self-confident, and ashamed of making mistakes. However, I was attracted to such a loose culture, which was positively used in America, not thinking about the details, and related naturally with anyone and anywhere. In Japan today, young people are shrinking without being able to have introverted self-confidence and firm confidence. I want to incorporate this American culture while developing into a diverse and international.

IV 成果と検証（生徒アンケートより）

研修終了時に行った参加者を対象とするアンケートを実施し、分析を行った。

1. VGRの効果について



(5 = とてもよい 4 = よい 3 = ふつう 2 = あまりよくない 1 = よくない)

① V (Vision)

例年と同様に、高評価である。海外研修を通じて将来へ向けた視野の拡大と多面的な視点を持つという“Vision”を向上させる効果は、非常に大きいと思われる。

- ・海外留学を視野に入れることができた。
- ・物事を見る視点や考え方が前進した。
- ・自分でも意外であったがアメリカの教育に興味を持った。新しい視野が広がった。
- ・医療研究者として海外で働くことに強い興味を持った。
- ・内向的な考えではなく外の世界に目を向けようと感じた。

② G (Grit)

昨年度と比較して、Q3, Q4 の「5」の評価が各 10%が増加した。特に、ハーバード大学メインキャンパスでの本格的な英語での講義が“Grit”の向上に有効であったと分析できる。また、質問力も向上したことを自覚できたことも高評価が増加した要因であると考えられる。

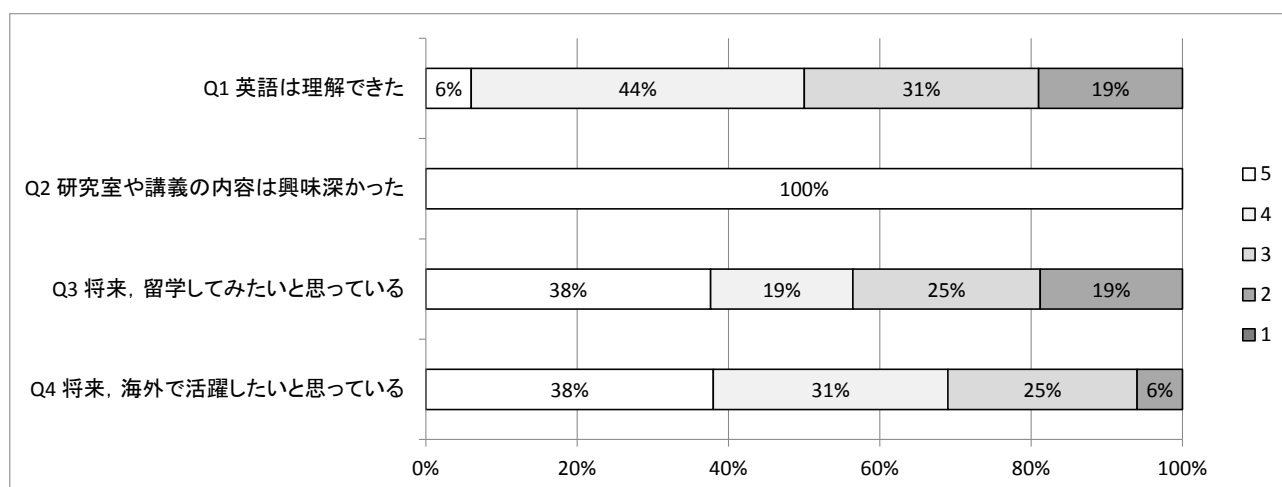
- ・自分から積極的に質問をする姿勢が身についた。
- ・何事にもチャレンジする気持ちを持つことができた。
- ・質問力が身についた。
- ・今までの学校での生活を見直す良いきっかけになった。勉強は自分の意見を持つために不可欠だと分かった。
- ・積極的に行動するための自信がついた。

③ R (Research Mind)

クリティカルシンキングの講義や、自分の考えを発信して議論するといった活動を通して、研究における協働性や論理的思考などの“Research Mind”の重要性を実感できたと考えられる。

- ・英語力の向上は言うまでもなく確実に感じられる。
- ・選抜された仲間と協働して取り組んだことで新しい見方や考え方が身についた。
- ・自分が疑問に思っていることを自ら発信できるようになった。そしてそのことで理解が深まることを知ることができた。

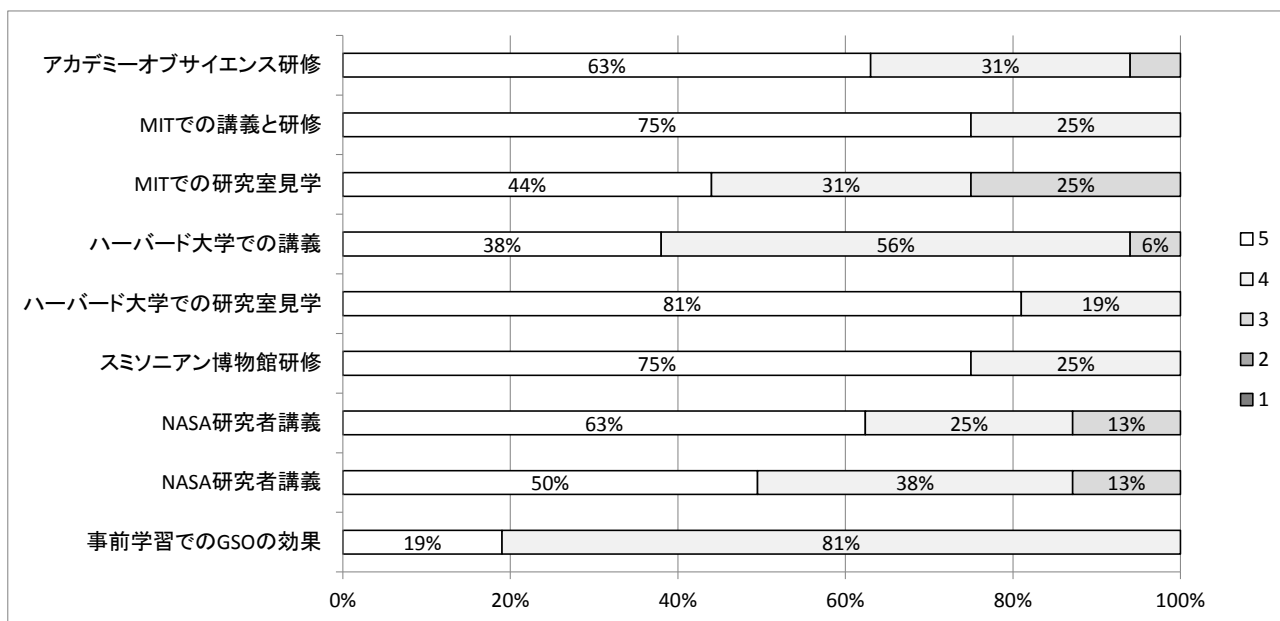
2. 研修全般について



研修に参加した生徒たちは、本校を代表する選抜された生徒たちであり、授業での英語はもちろん科学技術にも興味関心が非常に高い。この研修も6回目を迎えるが、外国人と接する機会の少ない本校の生徒にとっては、事前学習でのGSOの方々による英語指導、課題研究発表での英語プレゼンテーション指導などは、非常に効果的であり、英語への学習意欲がより向上している。研修先での研究者の方々からの研究紹介でも、通訳を介さないで内容をしっかり把握し、わからないことがあれば“Grit”を発揮して、質問することで理解を深めることができた。世界トップレベルの研修先で、質問や自分の考えが研究者に伝わることで、さらに“Grit”が高まり、将来への夢や“Vision”を広げてくれた。また、世界最先端で活躍するトップサイエンティストたちの方々の人柄や考え方を知り、研究施設に実際に訪れることで、自分の将来の研究分野に必要な“ResearchMind”と“Vision”を得ることができる貴重な経験だった。

- ・講義後のミーティングで友人たちと内容について補い合うことができた。仲間と協力することの大切さも学ぶことができた。
- ・理解できないところを英語で質問することで、他の場所でも質問する自信につながった。
- ・今まで体験したことがない本格的な英語での講義であった。
- ・日本の大学だけではなく世界のすごい大学の研究内容を知ることができ視野が広がった。
- ・自分が好きなことを仕事にしている方々を見て、その熱意は衝撃的であり、大変詳しく説明して下さった。

3. 各研修内容について



① アカデミーオブサイエンス研修

生徒たちにとって、海外研修で最初に訪れた研修施設である。入国手続きに時間がかかり、若干疲れが見える中での研修であったが、緊張することなく、積極的に英語で質問ができた。博物館内での講義のみならず標本室まで見学することができ、非常に有意義な研修となった。

- ・ 多種多様な生物を見ることができ貴重な体験ができた。説明する方が楽しそうだった。
- ・ Behind the scene tour で博物館の舞台裏を見学できるという貴重な体験ができ質問をたくさん行うことができた。
- ・ 鉱石や動物の保存状況について学ぶことができた。
- ・ 博物館の使命感を学ぶことができた。
- ・ 自分の英語で理解できたり自分の質問に答えてくれたりしたことに感動した。

② MITでの講義と研修

大学院生による講義を受けた。研究内容や留学について、ご自身の経験を含めてお話をいただいた。留学に対する考え方、留学中の生活など、今まで知り得なかったことを多く学ぶことができたのは大きな収穫であった。

- ・ 海外留学のメリットを聴くことができ将来への意欲が高まった。海外の学生の学習意欲が高いことを学んだ。
- ・ 東京大学とMIT、日本とアメリカの相違点について知ることができた。
- ・ 留学という選択肢は遠い存在だったが、自分の意志と実績を持っていれば可能だと知り留学という選択が身近になった。
- ・ MITで日本人研究者が活躍してることに憧れを感じた。
- ・ 目標を持って自ら行動することが大事という言葉に心が動かされた。

③ MITでの研究室見学

午前は、学内見学を行った。学内のいたるところに研究成果が展示されていたり、遊び心のある展示もあったりして、自由な雰囲気の中で最先端の研究が行われていることを感じた。話の内容には専門的なものが多かったが、分からない単語はすぐに質問するなど、さらに生徒たちの積極性が増したと感じられる研修だった。人文コースの生徒も、積極的に英語で質問する場面も見られた。

- ・MITの学生が研究したり活発に議論する様子を見て素晴らしい環境だと感じた。
- ・大学の規模が大きく一つの町のように感じた。学校と言うより研究所のようであった。
- ・日本の大学とは異なり学生同士が活発に意見を言い合っていたり自由に研究をしているように感じました。
- ・多様な人種や女性が多いことがとても印象に残っている。

④ ハーバード大学での講義

大学生から、クリティカルシンキングについて講義を受けた。本格的な英語の講義であり、生徒たちは“Grit”を発揮して、専門用語で分からないところがあれば質問したり、お互いに協力して講義に臨んでおり、成長した姿が見られた研修であった。また、講義で学んだクリティカルシンキングの手法を、帰国後、校内の生徒たちにも広めようという“Research Mind”が身についた生徒が多く見られた。また、講義までの時間を利用して、大学内の学生に事前研修で作成しておいたアンケートを実施した。積極的に声をかけてアンケートをお願いし、英語コミュニケーションに次第になれていく様子が感じられた。

- ・すべて英語での講義であり、8割は聞き取ることができ、内容理解できた。事前学習とGSOの成果を最も発揮できた。
- ・リスニング能力をもっと身につけなければと実感した。
- ・クリティカルシンキングの手法は日本人に足りないものだと感じた。情報化社会で批判的なものの見方、考え方の大切さを学んだ。
- ・英語での本格的なdebateであり、話している内容が分からないときは悔しかった。2対2のdebateは学校に戻っても引き続き行っていきたい。
- ・理解できないところを英語で質問することで、他の場所でも質問する自信につながった。

⑤ ハーバード大学での研究室見学

ハーバード大学メディカルスクールのラボを見学させていただくことができた。日本の大学と異なり、研究室の壁が無いスペースでの研究の雰囲気を感じることができ、興味深かった。世界最先端の研究施設を見学できたことは生徒たちにとって大きな経験だった。

- ・現地で活躍する日本人研究者の方々とお話する中で将来の進路について再考させられ、視野が広がりました。
- ・アメリカで研究している日本人研究医の方から、仕事と家庭が両立できる場所であると教えてくださりアメリカで働くことに興味を覚えた。
- ・small awareness, chance, goal, vision, have fun という5つの言葉がとても心に残った。

- ・日本人が世界に出て行く上で何が圧倒的に不足しているかに気づかされた講義であった。
- ・日本が世界から見ると衰えつつある市場だと言うことに危機感を覚えた。もっと真剣な意見交換を日頃から行わなければならないと感じた。
- ・自分の意見を持つこと、積極的に発表することがとても大切であることを実感した。

⑥ スミソニアン博物館研修

世界屈指の博物館であり、様々な研究を志望する生徒の要望に応えられる展示内容であった。研修後に、地域の博物館展示にもアイデアを生かそうとする感想もあり、研修後の地域での科学ボランティアに有効な効果が期待できる。また、日本とアメリカでの科学啓蒙活動の考え方や規模の違いを改めて認識できたようであり、日本での科学ボランティア活動や博物館等での科学教育の必要性を実感したようである。

- ・アメリカの子どもたちが参加している **workshop** を見学した際に、幼少期から質問や意見を述べる機会が用意されており、宇宙や航空に興味を持たせることができていると感じた。
- ・展示方法や見せ方が日本の博物館にはないものが多く勉強になった。
- ・これだけの大規模な所蔵物を子どもたちに無料で公開しているアメリカの圧倒的な教養と、国民の教育への寛容さを感じた
- ・時系列や地理的なつながりなど展示方法の工夫で、展示物を多角的に捉えて考えることができるようになることを知った
- ・「つやま自然のふしぎ館」と規模は異なるが、展示方法には負けていないところもあった。

⑦ NASAゴダード宇宙飛行センター研修

NASA の研究員の案内で、施設見学を行った。衛星の制作現場や管制室を見学し、非常に刺激を受けた。現地研究員による英語での説明であったが、生徒は内容をしっかり聞き取れており、的確な質問を行っていた。英語力についても相当自信がついてきたようであった。

- ・人工衛星の管制室は非常に興味深かった。また、JAXA のすごさを改めて知る機会になった。
- ・NASA と JAXA の連携を知り、日本の技術を誇りに思った。
- ・宇宙開発に挑戦し続ける人類の歴史を知ることができた。

⑧ 事前研究でのGSOの効果

- ・実際に外国人に話しかけることにためらいがなくなった。
- ・生物学や宇宙について学ぶことができ、自分の学問的な興味の幅が広がった。
- ・自分の意見を積極的に表現することができるようになった。
- ・自分が英語を話すのが苦手だと感じていたのは、英語力ではなく、自分の意見や考えがないからだと感じることができた
- ・この事前学習やGSOがなかったらこの研修は成功していません。本当に感謝しています。

4. 次回に向けて

これまで同様、研修先、研修内容、事前学習でのGSOの活用など、それぞれ高い効果が確認できた。次年度も概ね今回に近い内容で実施する計画であるが、さらにこの効果を学校全体に普及させていくため、継続して研修内容を改善していく予定である。

6回目の海外研修となり、先輩から後輩へ、学校から地域へとメッセージが伝わっていく伝統ができた。選抜された生徒たち自身が、各自のミッションを自覚し、研修で得たことや感じたことを報告会で伝えるだけでなく、授業や部活動、学校での様々な活動の機会を通じて後輩や同級生に成果を普及することができている。

研修後の生徒たちは、幅広く多角的な“Vision”を得ることができており、多くの場面でリーダーシップを発揮している。また、失敗を繰り返しながらも勇気をもって何事にも臨む“Grit”の大切さも実感している。本校のSSH事業において、“Vision”、“Grit”、“ResearchMind”を育成する手段として、SSH海外研修は非常に重要な研修であることが、生徒の事前事後の変容で明らかであり、今後も研修内容を改善しながら継続していきたい。

最後に、本研修に関わってくださったすべての方々に感謝申し上げます。