

(For JSPS Fellow)

Form B-2
(FY2018)

Date (日付)

20/09/2018 (Date/Month/Year: 日/月/年)**Activity Report -Science Dialogue Program-**

(サイエンス・ダイアログ事業 実施報告書)

- Fellow's name (講師氏名): Toni Maier (ID No. P-17818)- Participating school (学校名): Koryo High School (北杜市立甲陵高等学校)- Date (実施日時): 19/09/2018 (Date/Month/Year: 日/月/年)- Lecture title (講演題目): Theoretical Chemistry – Chemistry on your Computer and more

- Name and title of your accompanying person (講義補助者 職・氏名)

Dr. Yasuhiro Iwabata (五十幡 康弘 博士, 早稲田大学理工学術院 次席研究員)

- Lecture format (講演形式):

◆Lecture time (講演時間) 73 min (分), Q&A time (質疑応答時間) 17 min (分)

◆Lecture style (ex.: used projector, conducted experiments)

(講演方法 (例: プロジェクター使用による講演、実験・実習の有無など))

For the lecture, I used Powerpoint slides together with a notebook and a projector. Most parts of the lecture were held as classical presentation, i.e. the students were just listening to the lecture. In addition, I included a small activity game, in which the students were motivated to participate actively by showing their opinions on certain statements by raising their hands (or not).

- Lecture summary (講演概要): Please summary your lecture 200-500 words.

The lecture consisted of two major parts, a non-scientific and a scientific part. In the former one, I briefly introduced my self and showed the students some interesting and perhaps astonishing aspects of my home country Germany. After that, I showed them how I became a scientist, beginning with my school time and ending with my current position as postdoc. Here, I laid a main focus on explaining how the style of learning and studying changed during this process and how I made my decisions, e.g. what subject I chose for university studies, why I started my PhD studies, why I became a postdoc, etc. In particular, the story about my way to science should serve as an example for comparison with their own situation. Next, I shared my impressions on Japan, my reasons to come to Japan and my opinions on the questions what one needs to become a scientist and what the students should learn, if they also want to become a scientist.

In the scientific part, I started with an introduction into theoretical chemistry. Since theoretical chemistry is largely unknown compared to other topics, I laid my focus on the explanation of the general concepts to enable the students to understand the usefulness of this research field and its impact on chemistry research and their daily lives. At the end, I gave an overview about different levels of theory used in this field. To give an insight into my field of specialization, quantum chemistry, I gave the students a short introduction into quantum mechanics, with the

focus lying on showing the ideas behind the theory and the non-intuitive nature of this fascinating theory rather than the mathematical background. Hence, I finished the lecture by explaining the famous gedanken experiment "Schrödinger's Cat".

- Overall advice or comments to future participants in the program (今後の講師へのアドバイス):

As specialists in a certain field of science, researchers tend to take some knowledge about their field as granted. While this assumption can be safely made, when communicating with other researchers in the same field, e.g. when giving a lecture on a conference, it does not work, when giving a lecture to high-school students. That is, one cannot assume any special knowledge one has first acquired during university studies or during research. However, one should also not underestimate the interest of the students and omit difficult topics. This would make lectures less fascinating. I would rather give the advice to try to collect the students at a level they know from school and then shift slowly to the difficult topic. Also, an easy and pictorial explanation of difficult tasks is indispensable.

Furthermore, the intention of the lecture is completely different from the intention of conference presentations. On conferences, the main focus lies on convincing other researchers of one own's ideas and acquiring more reputation. That is, one has to finish the presentation with a clear final statement. On the other hand, the focus of the Science Dialogue lecture, in my opinion, should lie on showing the students the fascinating aspects of science in general. That is, the own research serves just as some kind of example to transmit this fascination. Accordingly, it is not necessary to show all the details of the own research. I rather would give the advice to focus on the interesting aspects and make them as clear as possible to the students.

In this sense, I think that it is also advisable to include some controverse, astonishing and/or funny aspects in the presentation, which motivate the students to listen to you and encourage further discussion. For example, this can be an impressive experiment or just a counter-intuitive or controverse theory. In general, I think the Science Dialogue lecture should be more about making an interesting experience rather than understanding all details of your research.

Regarding presentation style, one should use as many pictures, graphs and schemes as possible. This helps the students to grasp the topic immediately, even if they don't understand the spoken English. In cases, where longer text passages are unavoidable, I would give the advise to use optical separators, such as colored boxes, and use animation to build the slide up step by step. Furthermore, Japanese translations should be provided for difficult words, if they are not further explained in the lecture or if it significantly simplifies understanding.

Last, one should try to speak loud and as clear as possible to enable students to understand the lecture. Also a moderate English speed is advisable. However, I don't think that speaking as slow as possible is necessary, since this would diminish the experience for the students to listen to natural spoken English.

- Other noteworthy information (その他特筆すべき事項):

Some scientists are very busy with their own research. Accordingly, they perhaps simply do not think about participating in the Science Dialogue program or they are just hesitant to fill the application forms, since this represents another obligation. However, this does not necessarily

mean that they are not willing to or that they don't like to participate in the Science Dialogue program. In this respect, it is advisable to give these fellows a little 'push' by asking them directly, if they want to give a presentation at a certain school. This is what happened in my case. In fact, the direct question by the 'Science Dialogue' staff somehow forced me to make a decision (but in a good way) and it finally prevented me from letting the chance go by to give the lecture. Hence, I think this is a good practice to motivate fellows to participate in the program.

- Impressions and comments from the accompanying person (講義補助者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。)

私は講義補助者として事前に発表スライドのチェックを行い、当日は質疑応答での通訳および補足説明を担当しました。これまでに研究者以外に発表する機会はなかったため、本事業は講師、講義補助者ともに大変よい経験になったと思います。この制度が今後も続くことを願っています。