

International Student Exchange 2016 – 2019

Student Feedback Questionnaire

The purpose of this questionnaire is to evaluate the lessons learned of the AIR international student exchange.

By filling out this feedback report, you agree that your picture and experience will be published on the homepage of the AIR project. <http://www.air-project.org/>

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| Name of student: | Jonas Busch |
| Gender: | Male |
| Age: | 23 |
| Degree: | Bachelor of Engineering |
| Hosting university: | University of Zambia |
| Sending university: | University of Applied Science Ingolstadt |
| Period of exchange: | 04.12.16 – 18.12.16 |
| Field of study/major: | Renewable Energy |
| Field of interest during exchange: | Renewable Energy |
| Further graduation plans (e.g. PhD program): | Master Studies: Master of Applied Research in Engineering Sciences (since Oct. 16) |

| Please tick the appropriate box | I strongly agree | I agree | I neither agree nor disagree | I disagree | I strongly disagree |
|---|------------------|---------|------------------------------|------------|---------------------|
| Program | | | | | |
| I gained insights into the practical implementation of RE in the host country (sight visits etc.) | | X | | | |
| I gained knowhow in field of my study | | | X | | |
| The courses were helpful for my further research | | | X | | |
| The agenda was well structured | | X | | | |
| Organization | | | | | |
| The journey preparations were well organized | X | | | | |
| The support during the exchange was good | X | | | | |
| The post processing of the exchange was well organized | | | X | | |

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|--|---|--|--|--|--|
| The reimbursement process was satisfactory | | | | | |
| The accommodation was pleasant | X | | | | |
| Local transportation was well organized | X | | | | |
| I socialized with local students | X | | | | |
| I recommend the exchange | X | | | | |
| Others: | <p>What would you like to be changed/ be improved for the future? To locate the exchange in a period of time when there is no holiday at the university.</p> <p>Did you experience any difficulties during your exchange? -</p> | | | | |

Please write a report about your student exchange including organization, agenda, experience, lessons learned, suggestions for improvement, and tips for other students (max. 590 words, Arial 12)

The duration of this student exchange program was for a period of two weeks. The partner University was the University of Zambia, located in Lusaka.

The University of Zambia (UNZA) was established in 1965. The main campus is the Great East Road Campus which is situated on the Great East Road, 6 km from the town center.

The Department I was mainly involved within the School of Engineering was the Department of Mechanical Engineering and Electrical and Electronic Engineering.

The activities during the stay were discussed at the first day, together with the professor in charge of the AIR-Project Dr. Ackim Zulu and two mentors: Mr. Mwansa Kaoma and Mr. Shadreck Mpanga. The activities were the following:

- During the stay I have been involved in preparing laboratories for different Renewable Energy plants. The existing labs include a small test plant for biogas/bioethanol digesters, a test equipment to simulate a hydropower station, one for off-grid PV system and one for solar thermal systems. The laboratory equipment has not been used within labs for students since installation. During my stay we were able to develop a student guidance and questionnaire for the solar thermal testing rig. Three labs have been developed: a test for testing the thermosiphon-solar system, a test for forced convection solar system including the calculation of the efficiency of the system, one lab for calculating the energy amount produced by the solar system. The work has been done in collaboration with the lab technician in charge Mr. Ali Banda.
- Ali Banda also showed me an existing workshop for producing briquettes for cooking stoves by using organic waste material like saw-dust, leaves or the waste of the maize crops. Through converting the waste material to char by

thermal energy and in the second step forming briquettes by additional usage of a binder, the usage of fire wood or charcoal (out of wood) could be reduced.

- At InES a bachelor thesis has been done at the Boarding Secondary School in Monze. The plan is to equip the school with Renewable Energy resources to gain more independency from the electric grid. Zambia has been facing many problems with power shortage in the past years. Due to less rains and the fact that the energy output of the hydropower plants is decreasing, load shedding became more frequently. Also an additional factor was the rise in energy consumption of major towns like Lusaka. Through the site visit together with Mr. Mwansa Kaoma at Monze we could solve some problems regarding the further steps for the planning process.
- Together with Dr. Ackim Zulu we did a site visit to the Kafue Hydro power plant, which produces more than 50 % of the energy in Zambia (size: 1200 MW).
- A site visit to see a cooperation project between UNZA and TUM (Technical University of Munich) has also been done. Within the project a model for a classroom at a primary school using green materials has been developed. The aim was to improve the climate in the classroom in terms of temperature, light and ventilation.
- The company Wasaza is dealing with waste water treatment, bio latrines as well as construction of small scale biogas digesters for schools or small scale farms. We tried to figure out if a collaboration between InES, the Monze Boarding school and Wasaza could be possible in order to construct a biogas plant at the school.

In terms of the duration of the exchange I would like to suggest to expand it at least to three weeks, because within only two weeks it was just possible to start with small projects, but finalizing them was not quite easy. I also would like to suggest that in future the students should go to the partner university during semester terms in order to get more in contact with local students. Regarding the accommodation I would still suggest that the Commonwealth Center is quite a good place, because it is not too expensive and it is very close to the School of Engineering. I would also like to encourage further students to take part in teaching lessons of different courses.

Please add a picture of you during your stay at the partner university (you together with local partners at the university/excursion) (send it also as a separate file via email)



Picture 1 At the Entrance gate at UNZA



Picture 2 Charcoal made out of organic waste



Picture 3 The organic briquettes



Picture 4 Mr. Ali Banda in front of the solar thermal simulator



Picture 5 One of the hydro power labs at KGRTC



Picture 6 The Kafue Gorge Hydro Power Plant



Picture 7 Green House Building for a Primary School in Lusaka in cooperation with TUM



Picture 8 Final Picture with Dr. Ackim Zulu, Ali Banda, Jonas Busch, Prof. Muya and Mr. Mwansa Kaoma



Picture 9 Picture in front of the School of Engineering: Mr. Shadreck, Jonas Busch, Prof. Muya, Dr. Zulu, Mr. Mwansa