

Train of Trainers Workshop Innsbruck

11.03.2019 – 15.03.2019

Author(s)	Prof. Wolfgang Streicher, Ms. Apeksha Shandilya (M.Tech.)		
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Project Coordinator

Prof. DI Dr. techn Wolfgang Streicher,

University of Innsbruck (UIBK)

Technikerstrasse 13 | 6020 Innsbruck, Austria

Tel: +43 (0) 512-507-63650 | Mob: +43 (0) 676-872-565 320 | Fax: +43 (0) 512-507 36902

Email: wolfgang.streicher@uibk.ac.at

Project website: HEBA website



Review Table

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Contents

TRAIN OF TRAINERS WORKSHOP INNSBRUCK.....	1
REVIEW TABLE	2
1 OVERVIEW ABOUT PARTICIPANTS AND LECTURERS	4
2 SUMMARY OF THE WORKSHOP DAYS.....	7
2.1 Monday, 11th of March, 2019	7
2.2 Tuesday, 12th of March, 2019.....	8
2.3 Wednesday, 13th of March, 2019	9
2.4 Thursday, 14th of March, 2019	10
2.5 Friday, 15st of March, 2019	Error! Bookmark not defined.
3 TRAINING MATERIAL	13
4 PARTICIPANT LIST.....	14
5 EVALUATION RESULTS	15
5.1 Benefit and knowledge gain	15
5.2 Workshop Quality.....	18

1 Overview about Participants and Lecturers

In Table 1, the participants of all different Jordanian, Egyptian and Lebanon Partner Universities are listed.

Table 1: Participants from Jordanian, Egyptian and Lebanon Partner Universities

University	Participant Name
The University of Jordan (UJ), Jordan	Dr. Bashar Qawasmeh
	Dr. Mohammad Alrbai
	Prof. Mahmoud Irshidat
	Dr. Ali Haitham Alhadidi
Lebanese University (LU), Lebanon	Dr. Daoud Baalbaki
	Dr. Elias Kinab
American University of Beirut (AUB), Lebanon	Dr. Nesreen Ghaddar
	Dr. Fadl Bdeir
Helwan University (HU), Egypt	Mohammed Ahmed Ramadan Ahmed
	Arafa Soliman Sobh Khalil Arafa
	Mohamed Hamoud Ahmed Ahmed
Jordan University of Science and Technology, Jordan	Mrs. Asma Mahmoud Falesh Bataineh
	Mr. Mohamad Ismail Oqla Al Widyan

Arab Academy for Science, Technology and Maritime Transport (AASTMT), Egypt	Mrs. Rola Samir Abdel Rahman Ahmed Afify
	Mr. Tarek Mohamed Ahmed Hassan Ahmed
	Mr. Hesham Elsayed Saber Elsayed Ahmed Awad
	Prof. Mohamed Khamis Hassan

In Table 2 the agenda of the week including all lecturers, given by Innsbruck University, are listed with the topics of their contribution.

Table 2: Agenda of the workshop

Date	Time	Topic	Contents	Lecturer
Mo. 11/03/19	09.00 – 12.00	HVAC compact units, Façade integration	HVAC compact units, Packaged room A/C and Portable A/C, Next Generation A/C technology.	Dr. - Ing. Fabian Ochs,
			Façade Integration	Dipl. -Ing. Dietmar Siegele
	LUNCH BREAK			
	13.30 – 17.00	Theory in Solar Thermal Systems and Building integration	Theoretical background, heat demand houses, components of solar thermal systems, stagnation of solar thermal systems, hydraulics of solar thermal systems, hot water stores, solar system design features, building integrated solar collectors, solar thermal cooling systems, summary and discussion.	Prof. Wolfgang Streicher
Business dinner in the authentic Austrian restaurant in the city: 18.00 - 21.30				
Tue. 12/03/19	10.15 – 12.30	Some HVAC related elements of Applied Thermodynamics	Introduction, heat exchanger, numerical finite difference simulation of walls, tubes and water stores	Prof. Wolfgang Streicher
	LUNCH BREAK			

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	13.30 – 17.00	HVAC-Systems in Buildings (Heat pumps, Cooling systems...)	Basic principles (heating, cooling, dehumidifying, cleaning, air movement), heat pumps, role of refrigerants, compressors, evaporator, condenser, expansion device, filter-dryer, looking glass, pressostats, heat sources	Prof. Wolfgang Streicher
Wed. 13/03/19	09.00 – 12.00	Solar Thermal Simulation tool	Solar thermal, photovoltaics, heat pumps, natural power heating, Software installation, application, examples	Prof. Wolfgang Streicher
	LUNCH BREAK			
	13.30 – 17.00	Laboratory visit	hardware in the loop session	Norbert
Thu. 14/03/19	09.00 – 12.00	Excursion	Excursion to HELIOTHERM company	Prof. Wolfgang Streicher
	LUNCH BREAK			
	13.30 - 17.00	Overview Simulation Tools	Coupled simulations of buildings and HVAC with public available tools; presentation of typical case studies and possibilities how to use the different tools.	Dipl.- Ing. Alexander Thur, PhD
Fri. 15/03/19	09.00 – 12.00	Ventilation	Ventilation Technology	Assoc. Prof. Dr.-Ing. Rainer Pfluger
	12.00 - 13.00	Certificates distribution and a short talk with participants, feedback from trainees		

2 Summary of the Workshop Days

2.1 Monday, 11th of March, 2019

On Monday, 11th of March, 2019, the Train-of-Trainers Workshop started at University of Innsbruck at 9.00 am. Prof. Wolfgang Streicher addressed all the participants and participants introduced themselves.



Figure 1: Welcoming Speech at Innsbruck University of Technology

Workshop was started with a lecture from Dr. - Ing. Fabian Ochs, on HVAC compact units. This lecture included introduction and detailed information about HVAC compact units, packaged room A/C and Portable A/C, Next Generation A/C technology.



Figure 2: Lecture by Dr. - Ing. Fabian Ochs, on HVAC compact units

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Afterwards Dipl. -Ing. Dietmar Siegele, delivered lecture on Facade Integration. Which was very interactive and informative session.

In the afternoon, Prof. Wolfgang Streicher delivered lecture on Solar Thermal Systems and Building integration. He discussed following topics comprehensively with the participants.

- Theoretical background of solar thermal systems,
- Heat demand in houses,
- Components of solar thermal systems,
- Stagnation of solar thermal systems,
- Hydraulics of solar thermal systems,
- Hot water storage,
- Solar system design features,
- Building integrated solar collectors,
- Solar thermal cooling systems, etc.

Because most of the participants were from Mechanical background, they find this session very informative and interesting for them.

Business dinner was organised in the evening in the authentic Austrian restaurant in the city. The nice evening was spend with the cultural and information exchange between the participants and host university representatives.

2.2 Tuesday, 12th of March, 2019

On Tuesday, 12th of March, 2019, Prof. Wolfgang Streicher started at 10.15 am sharp with the introduction of heat exchangers.

In the afternoon, the session started again at 01.30 pm Prof. Wolfgang held this session and discussed following topics with the participants:

- Basic principles (heating, cooling, dehumidifying, cleaning, air movement),
- Heat pumps,
- Role of refrigerants,
- Compressors,
- Evaporator,
- Condenser,
- Expansion device,
- Filter-dryer,
- Sight Glasses,
- Pressostats,
- Heat sources, etc.



Figure 3: Lecture by Prof. Wolfgang Streicher, on HVAC-Systems in Buildings

2.3 Wednesday, 13th of March, 2019

On Wednesday, 13th of March, 2019, Prof. Wolfgang Streicher started the session at 09:00 with the application of Solar Thermal Simulation Tool.

The Software SHW for the simulation of solar thermal plants is a free simulation tool which can be downloaded using following link:

<https://www.uibk.ac.at/bauphysik/forschung/shw.html.en>

In the afternoon, Dipl.-Ing. Norbert Hauer made “Hardware in the loop session” with the participants and made a laboratory visit with participants.



Figure 4: “Hardware in the loop session” by Dipl.-Ing. Norbert Hauer



Figure 5: Hydraulic and HVAC measurement laboratories visit by Dipl.-Ing. Norbert Hauer

2.4 Thursday, 14th of March, 2019

On Thursday 14th of March 2019, participants visited Heliotherm- Die Wärmepumpe company. This company is an innovative international leading manufacturer in the field of renewable energy.

The company representative gave an overview about the company and participants visited the manufacturing unit and got explanation on many technical questions directly from the experts in the field.

Figure 6, 7 and 8 are the pictures taken at Heliotherm campus.

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Figure 6: Welcoming participants at Heliotherm Company



Figure 7: Company presentation and discussion about their products



Figure 8: Group picture of the participants with the company representatives

In the afternoon, Dipl.- Ing. Alexander Thür, gave lecture on overview on simulation tools. In this session he discussed Coupled simulations of buildings and HVAC with public available tools. He presented few typical case studies and possibilities of using different tools.



Figure 9: Lecture delivered by Dipl.- Ing. Alexander Thür on simulation tools

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2.5 Friday, 15th of March, 2019

On Friday, 15th of March, 2019, Dr.-Ing. Rainer Pfluger talked on the ventilation technology.

In the session the discussion was about how the correct air budget is an often underestimated quality factor in surface treatment technology. While, where the heating, cooling, movement and filtration is concerned, a great deal of energy can be saved with innovative solutions.

Later on all the participants were asked to fill evaluation form and to share their views and suggestions to improve the training quality. In the end Prof. Wolfgang Streicher distributed certificates to the participants and thanked them for their contribution.

3 Training Material

All presentations delivered and discussed during the workshop week have been shared through the Dropbox.

4 Participant List

All participants had to fill a participants list in order to prove their attendance. The signed list is shown below.

Participation List – HEBA Train-the-Trainers-Workshop II on Solar Energy in Buildings and HVAC
Location: University of Innsbruck, Faculty of Technical Sciences

S.No.	Participant Name	Partner University	Monday 11.03.19	Tuesday 12.03.19	Wednesday 13.03.19	Thursday 14.03.19	Friday 15.03.19
1	Dr. Bashar Qawasmeh	UJ	<i>Bashar</i>	<i>Bashar</i>	<i>Bashar</i>	<i>Bashar</i>	<i>Bashar</i>
2	Dr. Mohammad Alrbai	UJ	<i>Mohammad</i>	<i>Mohammad</i>	<i>Mohammad</i>	<i>Mohammad</i>	<i>Mohammad</i>
3	Prof. Mahmoud Irshidat	UJ	<i>Mahmoud</i>	<i>Mahmoud</i>	<i>Mahmoud</i>	<i>Mahmoud</i>	<i>Mahmoud</i>
4	Dr. Ali Haitham Alhadidi	UJ	<i>Ali</i>	<i>Ali</i>	<i>Ali</i>	<i>Ali</i>	<i>Ali</i>
5	Dr. Nesreen Ghaddar	AUB	<i>Nesreen</i>	<i>Nesreen</i>	<i>Nesreen</i>	<i>Nesreen</i>	<i>Nesreen</i>
6	Dr. Fadl Bdeir	AUB	<i>Fadl</i>	<i>Fadl</i>	<i>Fadl</i>	<i>Fadl</i>	<i>Fadl</i>
7	Mohammed Ahmed Ramadan Ahmed	HU	<i>Mohammed</i>	<i>Mohammed</i>	<i>Mohammed</i>	<i>Mohammed</i>	<i>Mohammed</i>
8	Arafa Soliman Sobh Khalil Arafa	HU	<i>Arafa</i>	<i>Arafa</i>	<i>Arafa</i>	<i>Arafa</i>	<i>Arafa</i>
9	Mohamed Hamoud Ahmed Ahmed	HU	<i>Mohamed</i>	<i>Mohamed</i>	<i>Mohamed</i>	<i>Mohamed</i>	<i>Mohamed</i>
10	Dr Daoud Baalbaki	LU	<i>Daoud</i>	<i>Daoud</i>	<i>Daoud</i>	<i>Daoud</i>	<i>Daoud</i>
11	Dr Elias Kinab	LU	<i>Elias</i>	<i>Elias</i>	<i>Elias</i>	<i>Elias</i>	<i>Elias</i>
12	Mrs. Asma Mahmoud Faleh Bataineh	JUST	<i>Asma</i>	<i>Asma</i>	<i>Asma</i>	<i>Asma</i>	<i>Asma</i>

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S.No.	Participant Name	Partner University	Monday 11.03.19	Tuesday 12.03.19	Wednesday 13.03.19	Thursday 14.03.19	Friday 15.03.19
13	Mr. Mohamad Ismail Oqla Al Widyen	JUST	← COULD NOT GET VISA →				
14	Mrs. Rola Samir Abdel Rahman Ahmed Afify Dr. Rola Afify	AASMT	<i>Dr. Rola Afify</i>	<i>Dr. Rola Afify</i>	<i>Dr. Rola Afify</i>	<i>Dr. Rola Afify</i>	<i>Dr. Rola Afify</i>
15	Mr. Tarek Mohamed Ahmed Hassan Ahmed	AASMT	<i>Tarek</i>	<i>Tarek</i>	<i>Tarek</i>	<i>Tarek</i>	<i>Tarek</i>
16	Mr. Hesham Elsayed Saber Elsayed Ahmed Awad	AASMT	<i>Hesham Awad</i>	<i>Hesham Awad</i>	<i>Hesham Awad</i>	<i>Hesham Awad</i>	<i>Hesham Awad</i>
17	Prof. Mohamed Khamis Hassan	AASMT	<i>Mohamed</i>	<i>Mohamed</i>	<i>Mohamed</i>	<i>Mohamed</i>	<i>Mohamed</i>
18	Prof. Wolfgang Streicher (Trainer)	UIBK	<i>Wolfgang</i>	<i>Wolfgang</i>	<i>Wolfgang</i>	<i>Wolfgang</i>	<i>Wolfgang</i>
19	Dr. - Ing. Fabian Ochs, (Trainer)	UIBK	<i>Fabian</i>	<i>Fabian</i>	<i>Fabian</i>	<i>Fabian</i>	<i>Fabian</i>
20	Dipl.-Ing. Dietmar Siegle (Trainer)	UIBK	<i>Dietmar</i>	<i>Dietmar</i>	<i>Dietmar</i>	<i>Dietmar</i>	<i>Dietmar</i>
21	Dipl.- Ing. Alexander Thur (Trainer)	UIBK	<i>Alexander</i>	<i>Alexander</i>	<i>Alexander</i>	<i>Alexander</i>	<i>Alexander</i>
22	Assoc. Prof. Dr.-Ing. Rainer Pfluger (Trainer)	UIBK	<i>Rainer</i>	<i>Rainer</i>	<i>Rainer</i>	<i>Rainer</i>	<i>Rainer</i>
23	Dipl. – Ing. Norbert Hauer (Trainer)	UIBK	<i>Norbert</i>	<i>Norbert</i>	<i>Norbert</i>	<i>Norbert</i>	<i>Norbert</i>

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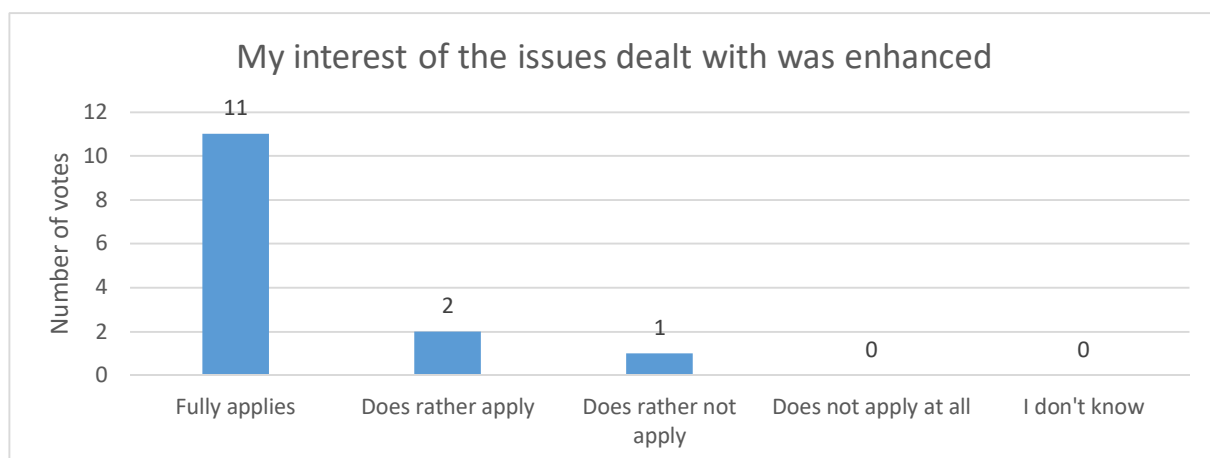
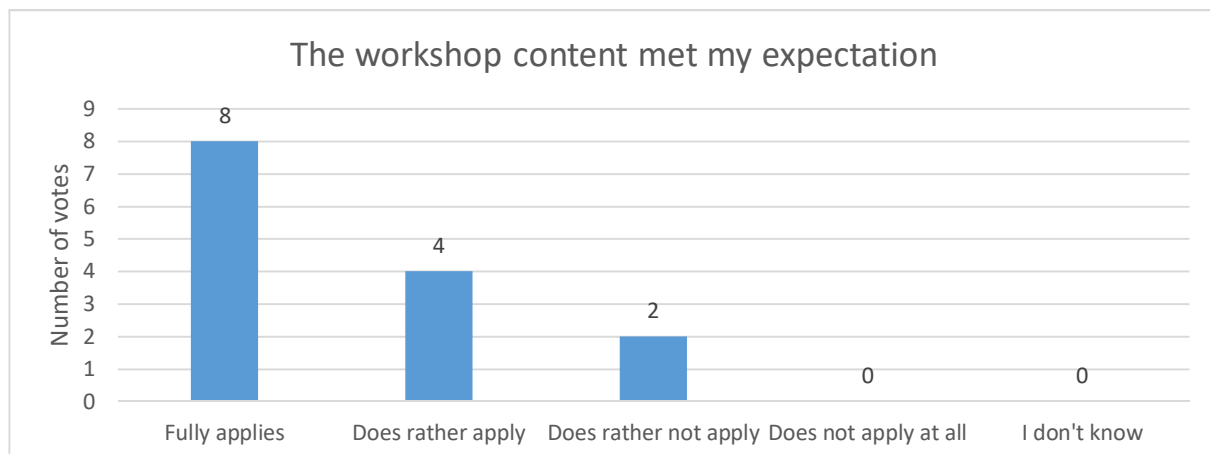
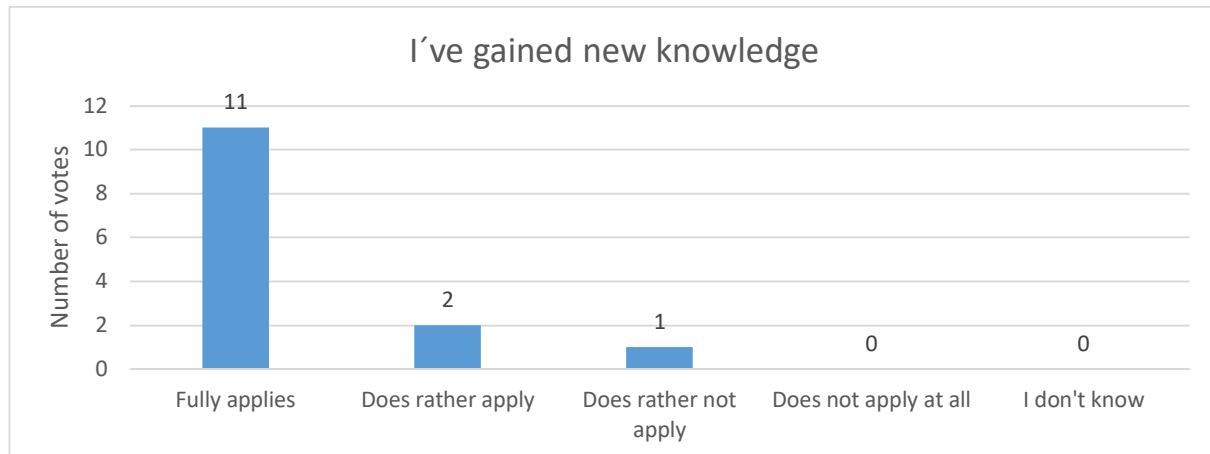
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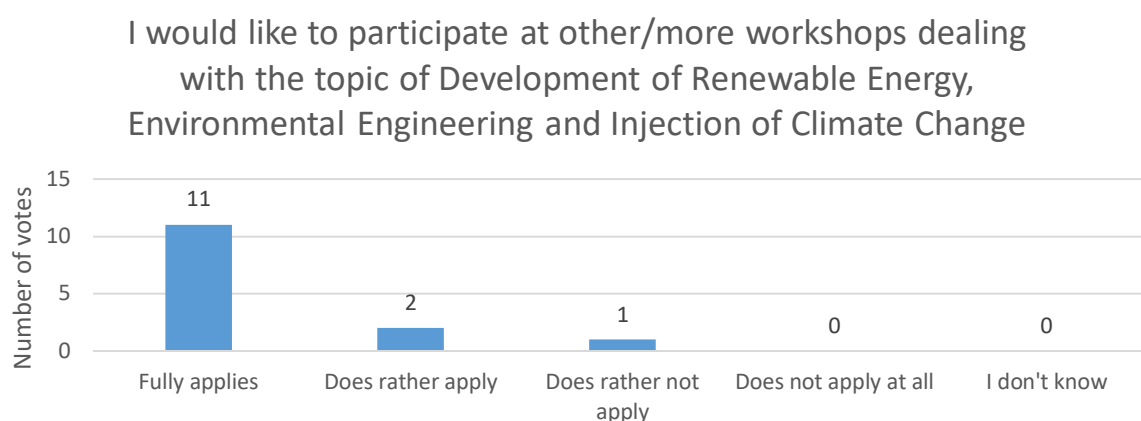
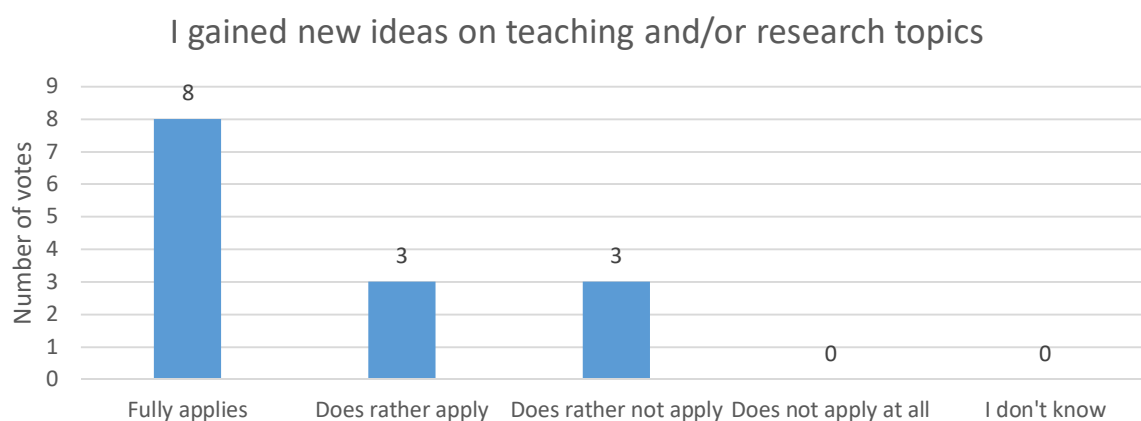
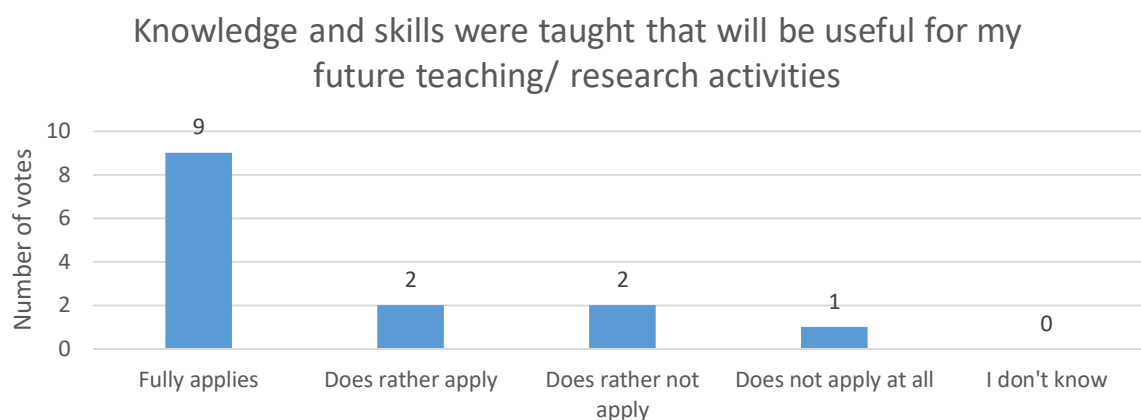
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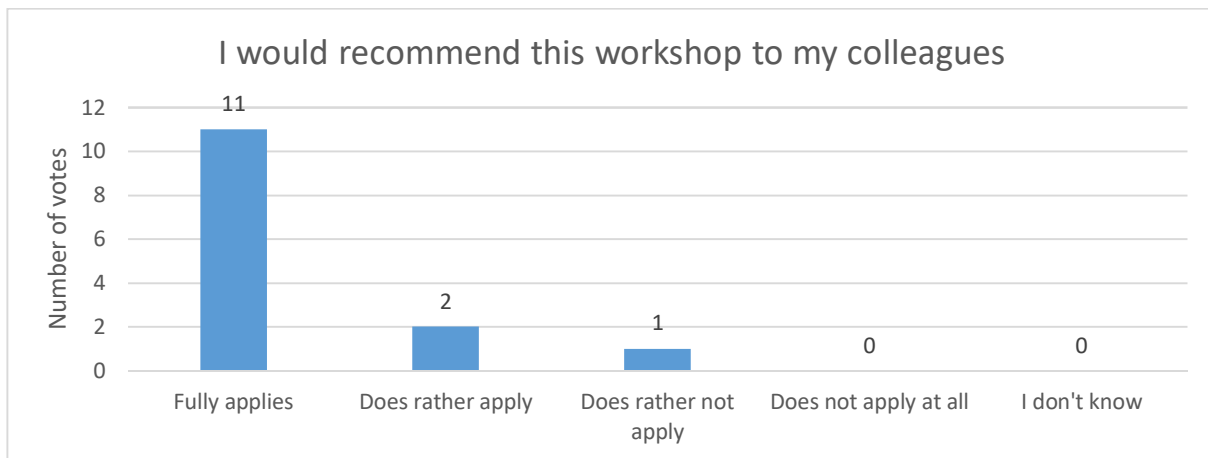
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5 Evaluation Results

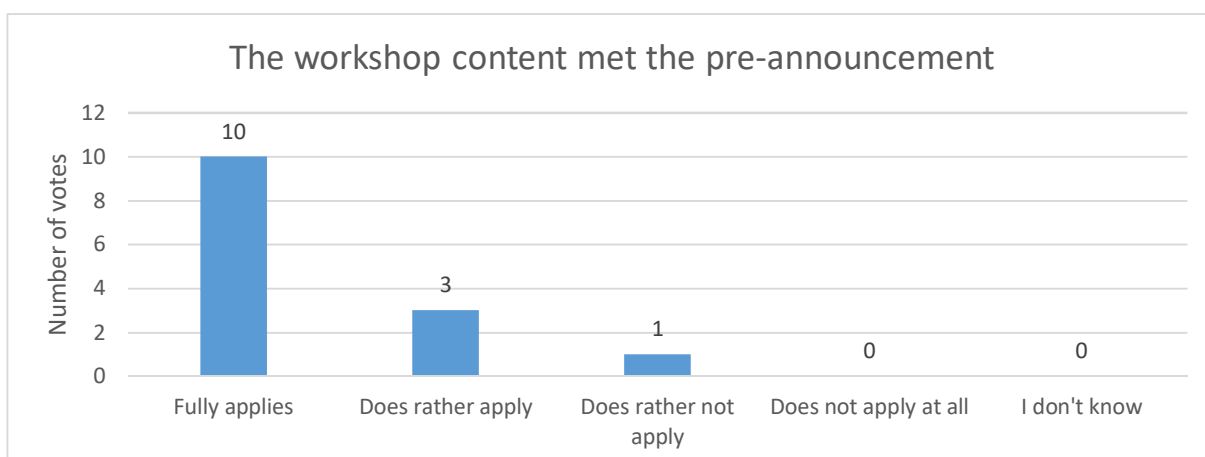
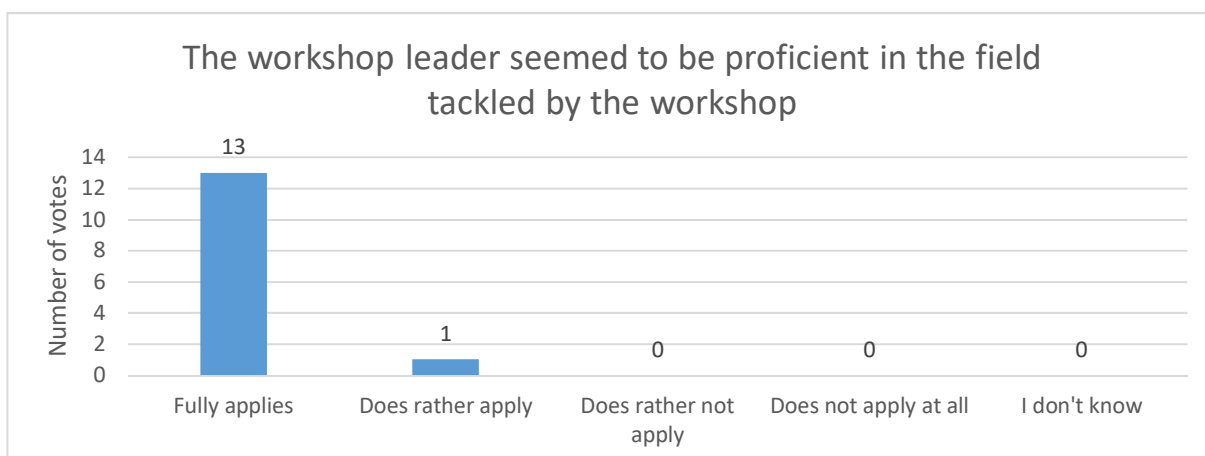
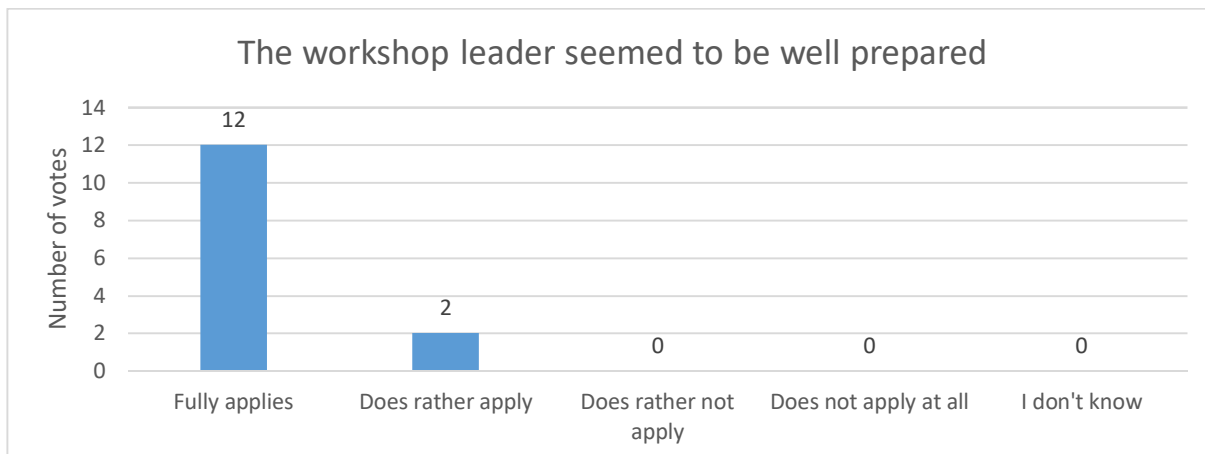
5.1 Benefit and knowledge gain



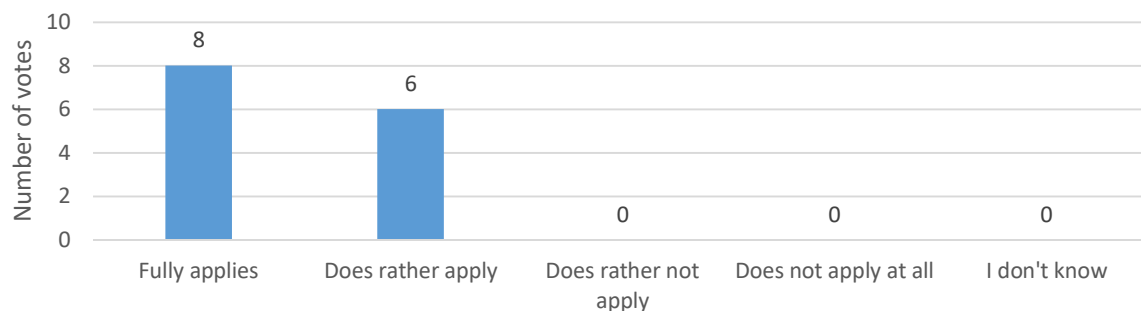




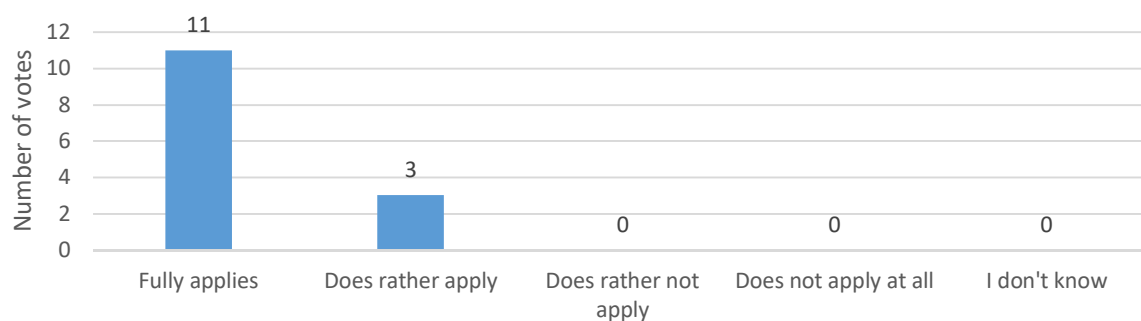
5.2 Workshop Quality



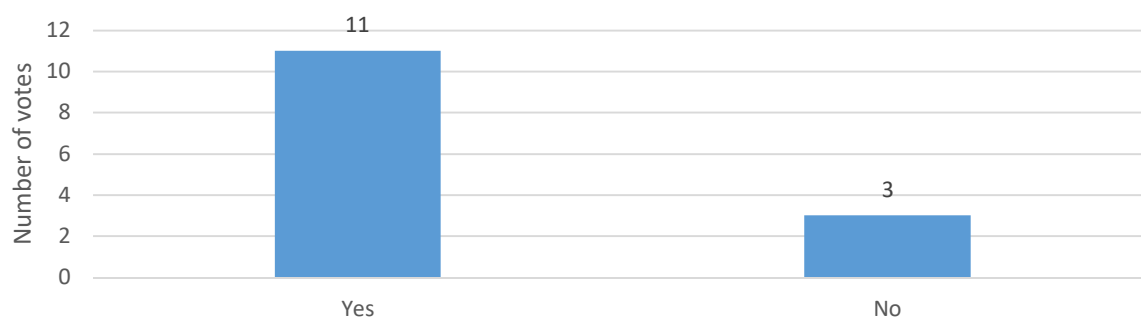
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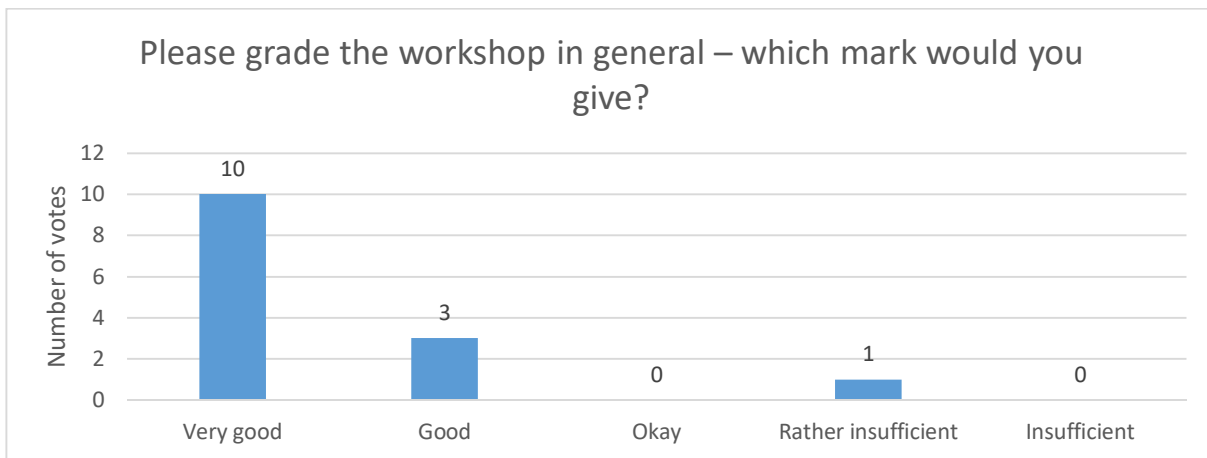


The workshop materials (if there were some) are well elaborated and useful for me



I am teaching at my university the same courses, or at least one of the presented courses in the workshop





What did you like about the workshop?

- The excursion was very well planned and efficient. In the workshop, participants were introduced to the European system of passive design and energy efficiency solutions.
- Very well planned training agenda and great interaction between lecturers and participants.
- Dr. Wolfgang was extremely competent in the field, knowledgeable and approachable to dealing with any teaching issues. The opportunity of interacting with a large group of people from different engineering backgrounds.
- Nice instructors, variety of the topics and the great help in the social activities. Knowledge and patience of the instructors.
- The new knowledge about heating and cooling techniques, the laboratories that we visited, and the new software learnt.
- Simulation tools learnt in training were very interesting.

What did not you like? What can be improved?

- Some lectures were long and irrelevant for some candidates.
- Software training needs more time.
- Least focus on research and recent topics.
- Some of the slides were prepared in German language.