A NEW INITIATIVE TO IMPROVE THE ENERGY EDUCATION AT THE SECONDARY AND TECHNICAL SCHOOLS IN THE ARAB WORLD

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Abstract

An initiative to improve the teaching of science, especially of energy related subjects (renewable- and nuclear energy) at the secondary and technical schools in the Arab World has been started. The first program of this initiative is based on establishing cooperation between Arab and European institutions for continuous training across the Arab world. The second program is based on establishing an Arab-European platform for the direct contact between the leaders of the scientific communities, foundations, organization, education authorities and teachers, to discuss all together the possible cooperation programs which are suitable to support science/energy education. The third program is based on promoting the energy literacy education efforts by supporting the social activities between teachers/students and the surrounding communities, using outreach programs, social media and multimedia tools. The fourth program contains the promotion of the teachers and authorities to improve the curricula; in order to include energy related subjects, considering significant practical skills. The financial support of OFID made it possible to start this program and to realize the first two activities in October 2015. The first activity was the organization of the Arab-European Summer School on Energy Education (AESSEE), which will be organized annually. The aim of the AESSEE is to improve the knowledge and the practical skills of teachers by providing them with updated information and scientific developments, through direct contacts with international experts. AESSEE-2015 was organized at TU-Vienna (October 19-31, 2015) with 20 participants from 8 Arab countries (Algeria, Egypt, Jordan, Lebanon, Libya, Oman, Saudi Arabia, and Tunisia). The scientific program included lectures, discussions, excursions and experiments, in collaboration with 19 scientists representing 13 European institutes and international organizations. The second activity was the organization of the Arab-European Forum on Energy Education (AEFEE) on October 30, 2015, which took place with the support and the participation of international organizations such as OFID, IAEA, Arab League and EUREC. The forum offered the opportunity to discuss the problems and the suggestions for cooperation with the participants of AESSEE. The scientific programs of the two events will be discussed in details.

Introduction

Since the 90s of the last century, most of the countries of the Arab world have started several programs to improve the education systems through significant investments in infrastructures, furthermore by developing curriculums focusing on science and mathematics or training programs for the teachers. However, these efforts were carried out within the available financial capabilities and the political situations. The education systems of 84% of the Arab population are in general suffering from several economic and social problems. Energy education for the Arab countries could be the ideal subject to bridge the gap between education and the job markets now and in the future which could be very attractive for technical schools and also would influence the market positively. Therefore, it was important to start an initiative for training the secondary school teachers in the Arab region in cooperation with several European organizations/universities and to organize the Arab-European Summer School on Energy Education (AESSEE) as the first step. Additionally, it also was necessary to start the second program by organizing the Arab European Forum on Energy Education as a platform for cooperation to improve the education systems at the Arab region.

Methodology

The selection procedure to attend AESSEE was based on writing a summary of a proposal (300-400 words) entitled “school based initiative to improve the renewable energy and energy efficiency culture“. We succeeded in selecting 20 candidates from Algeria, Egypt, Jordan, Lebanon, Libya, Oman, Saudi Arabian and Tunisia. The main efforts were focusing on providing a two weeks scientific program by engaging high standard scientists and institutions, in order to cover topically most subjects of energy and the related technologies. Therefore, 18 speakers representing 13 scientific institutions took part and that opened the opportunity for the participants to a wide range of contacts and further cooperation in several fields. The first forum was organized on the last day of AESSEE. The program of the forum included several talks and a panel discussion providing the opportunity to the participants to discuss directly with the scientific leaders the possible cooperation and support. The information gained from the summary of the provided proposals, two questionnaires and interviews with the participants were used to evaluate the background of the teachers regarding energy and their benefits from AESSEE.



AESSEE during the visit to IAEA



The closing ceremony of AESSEE - October 30, 2015

Results

After the evaluation of 44 provided summaries of the proposals (selected and non-selected candidates) it was obvious that only 66 % of the candidates were in the position to meet the requirement to provide a summary of 300 words or more. Some of them sent an abstract of 50 to 70 words only. After the analysis of three main indicators, namely, school based activities or ideas, country specific information and proposals for general projects or actions, it turned out that 23 % of the candidates had provided country specific information such as renewable energy installations, the profile of energy demand, or information regarding the education system, while 67% of the candidates mentioned general and broad suggestions regarding the implementation of renewable energy in general or at their countries, finally 10% had provided just general suggestions to improve the interest in renewable energy at schools. After the individual interviews with the participants one week after the scientific program, the participants indicated that their knowledge regarding energy had increased to at least 3 to 5 times, 25 % of them mentioned that their knowledge had improved 6 to 8 times in comparison to their information before the training program. AESSEE-2015 had provided a broad scale of information about the most important energy sources; therefore the response of the teachers was very fast due to their experience and their scientific background. Motivation is the key to change the Arab countries with simple resources, and the evidence is that the participants have started several training programs and activities at their schools and societies immediately after they returned back home. In general, the ideal training program for the teachers is characterized by less information, at the same time more discussion and practical demonstration.



Activities of some participants after AESSEE

Conclusions

AESSEE is an important program for the teachers of Arab countries, but it would be necessary to organize it for a period of 3 to 4 weeks in order to being able to extend the scientific program for more practical exercises.

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