16th UNESCO workshop on Active Learning in Optics and Photonics (ALOP Nepal 2011)

17 - 21 December 2011, Kathmandu University, Dhulikhel, Nepal

Summary:

Daily power blackouts that lasted many hours.
A day of national strike that shutdown all road transport.
An ongoing student strike at the host university.
These types of disruption are commonplace in many developing countries that struggle with limited resources, poor infrastructure and large populations. Education initiatives such as ALOP are vitally important in these countries as they are one way of improving the quality of "people resources" which will, in time, provide the mechanism for tackling the other issues holding back social and economic development.

Normally any one of the above disruptions would have a severe negative impact on the running of any 5-day, hands-on education workshop, but in ALOP Nepal 2011, such disruptions had no impact because of the careful and adaptive planning of the local organisers. A large diesel generator with sufficient fuel supply was always available to be switched in whenever the mains electricity supply failed. The night of the national strike, additional accommodation at the venue was booked for participants who would normally travel by bus to the workshop. An off-campus venue for ALOP was chosen so as to avoid any disruption by strikes at the University campus.

So despite these significant disruptions, the ALOP workshop continued as normal, and we are pleased to report that it was highly successful and productive.

Details:

The 16th UNESCO workshop on Active Learning in Optics and Photonics (ALOP Nepal-2011) was organized at the Kathmandu University International Center (KUIC), Dhulikel, during Dec 17-21, 2011. There were 6 experienced facilitators (4 male and 2 female), 5 "first-time" assistant facilitators (5 male) and 27 participants in the program (25 male and 2 female), which included 9 participants from universities and 18 participants from high schools, colleges and other institutions. All of the participants were Nepalese and 7 of these attended the previous ALOP Nepal in 2009.

The inaugural ceremony of the workshop was conducted on 17th of December, 2011 in Dhulikhel Lodge Resort in Dhulikhel which is situated very close to the workshop venue. The workshop was inaugurated by Prof. Dr. Suresh Raj Sharma, Vice Chancellor of Kathmandu University. Prof. Dr. Panna Thapa, Dean of School of Science delivered the welcome speech and Dr. Alex Mazzolini introduced the participants to the ALOP program and its aims. The opening ceremony was conducted by Dr. Raju Khanal from the Central Department of Physics, Tribhuvan University. Prof. Lok Narayan Jha, Head of the Central Department of Physics, Tribhuvan University spoke about the importance

of the ALOP training program in the development of Physics Education in Nepal. Prof. Sekhar Gurung, President of Nepal Physics Society (NPS), also stressed that NPS was always ready to help organize similar ALOP-style programs in other parts of Nepal. Finally, Dr. Deepak Subedi, Head of the Department of Natural Sciences and the local convener of the ALOP program, discussed the main features of the program. It should be noted that all speakers at the inaugural ceremony displayed a very good understanding of both active learning and the ALOP program.

After the opening ceremony, the training sessions were started in the Kathmandu University International Center. The first session was facilitated by Prof. Alex Mazzolini and included an introduction to the workshop, introduction to the ALOP facilitators and their assistants, and also the introduction of the participants themselves. The problems the participants shared in this first morning were similar to those for many developing countries: large classes, lack of equipment, set curriculum, etc. Nepal is a country with poorly developed infrastructure. At least one of the participants represented a school in an area *with no electric power!* It was interesting to note that several of the participants who had attended the first ALOP in Nepal (2009) reported having used the kits and the active learning activities in their teaching. The facilitators found this feedback very useful and interesting, as we do not normally hear of how ALOP workshops affect the teaching strategies of the participants.

Prof. David Sokoloff then presented his introduction to active learning, which included active engagement of participants in discussing an “optics magic” interactive lecture demonstration. Participants then undertook the Light and Optics Conceptual Evaluation (LOCE) pre-test. David also facilitated **Module 1 (Geometric Optics)** after the LOCE pre-test. Mr. Raju Bhai Tyata was the assistant facilitator for Module 1.

The second day of the workshop continued with Module 1 and was completed in the afternoon. Prof. Vengu Lakshminarayan facilitated **Module 2 (Lenses and Optics of the Eye)** in the second half of the second day. Dr. Raju Khanal was the assistant facilitator for this module. It should be noted that the alternate version of Module 2 was used, which utilised a smaller number of lenses, and a simplified optical alignment system (meter ruler and clay to hold components).

The third day of the workshop started with the remaining part of Module 2. After the completion of Module 2, Prof. Zohra Ben Lakhdar and Dr. Souad Lahmar facilitated **Module 3 (Interference and Diffraction)**. Mr. Shreedhar Raj Kandel, was the assistant facilitator for this module.

The fourth day of the workshop was opened by Mr. Ivan Culaba who facilitated **Module 4 (Atmospheric Optics)**. Mr. Ujjwal Man Joshi was the assistant facilitator for this module. This module was completed in the second half of the day. The next session of the day was opened by Prof. Alex Mazzolini who facilitated **Module 5 (Optical Data Transmission)**. The last day of the workshop was opened with **Module 6 (Wavelength Division Multiplexing)**. Dr. Deepak Subedi was the assistant facilitator for modules 5 and 6.

At the conclusion of Module 6, all participants took the LOCE post-test and the session was completed by soliciting feedback from the participants. Ten sets of the ALOP kits were then distributed to participants from many different zones of Nepal.

A key feature of this ALOP was that the assistant facilitators took a very active role in helping prepare the materials and facilitate the modules. In all cases, the assistant facilitators took responsibility for, and presented, parts of their module, and this seemed to work very well.

The workshop itself ran very well, and essentially kept to the schedule (with some minor delays due to heavy traffic delaying participants coming daily from Kathmandu.) The participants were enthusiastic and very motivated throughout the workshop. All participants seemed to be very, very positive about the ALOP workshop. There was almost 100% attendance on every day, with many of the academics having to reschedule their classes so they could attend all of the workshop sessions.

In all, the workshop was run very efficiently and effectively with the UNESCO grant of $7200 USD, $5000 from SPIE, and the other financial support from ICTP, National Academies (USA), and a local scientific equipment supplier (LTC Pvt. Ltd).

The facilitator team worked very well together. All modules were well received, and everyone enjoyed the activities, especially the “optics magic” demonstrations. Although Joe Niemela could not come to ALOP Nepal 2011, his help in preparing and sending copies of the workshop manual and facilitating the release of funds in a timely manner was very important and much appreciated. The assistant facilitators also worked very hard during the entire program.

The closing ceremony was organized at the Dhulikhel Lodge Resort on the 21st December, 2011. The program was conducted by Dr. Raju Khanal, coordinator of the local organizing committee. Two participants shared their thoughts about the workshop (which were very positive) and thanked the facilitators and the organizers for providing the opportunity to participate in the program. Chief guest, Prof. Suresh Raj Sharma, distributed the ALOP certificates to the facilitators and also thanked them for their support in training the Nepalese Physics teachers. Prof. Bhadraman Tuladhar, Registrar, KU congratulated the participants for the successful completion of the training program and also distributed the ALOP certificates to the assistant facilitators. Prof. Panna Thapa distributed the ALOP certificates to all participants. Prof. Alex Mazzolini briefly reviewed the workshop and thanked the local organisers for their careful and meticulous planning for the workshop. Dr. Deepak Subedi, convenor of the workshop, delivered the final vote of thanks.

Pre-workshop training:

One important aspect of this workshop was the special pre-workshop training for the five Nepalese assistant facilitators. This training was facilitated by Prof. Alex Mazzolini on Dec 15 and 16 at the workshop venue. The objective of this pre-workshop training was to prepare the assistant facilitators for the ALOP workshop. The participants of the pre-workshop training were: Dr. Raju Khanal, Dr. Deepak Prasad Subedi, Mr. Ujjwal Man Joshi, Mr. Raju Bhai Tyata and Mr. Shreedhar Raj Kandel. The two day pre-workshop was quite successful, with all assistant facilitators preparing their modules with great enthusiasm.

The ALOP regional coordinator (AM) met with assistant facilitators and explained what was required of assistants, as follows:

- Good understanding of module content and physics principles underlying the various activities (excellent familiarity with module notes and teacher notes). This was done in great detail in the pre-workshop
- Good familiarity with the equipment and how to use it. This was done during the workshop working closely with facilitators
- Active Learning philosophy and the role of the facilitator in ALOP workshops. This was covered in pre-workshop.
- Assistant facilitators were encouraged to be pro-active in interacting with facilitators and to work closely with facilitators in all phases of the workshop modules (preparation, delivery and post-module debriefing).

The training sessions went well and all assistant facilitators took pro-active roles in their modules. The experienced facilitators commented during the workshop that the assistant facilitators performed admirably but that they perhaps needed a little more *practical* experience with the ALOP equipment. Perhaps, in future ALOP workshops, assistant facilitators could be asked several months in advance of the workshop to try to locate or fabricate equipment needed for the kits locally. They could be reimbursed for anything they gather, and anything that they could not gather could be sent to them in advance to give them adequate time to train with the equipment.

In all, we are confident that we now have a core of ALOP coordinators and assistant facilitators in Nepal who could organize and run a local ALOP-style workshop with minimal help from outside Nepal. We believe this is a significant step forward in making ALOP workshops more accessible and sustainable.

Deepak Subedi, Convenor of the ALOP Nepal 2011 workshop
Alex Mazzolini, ALOP Regional Coordinator (Asia

Photos from ALOP Nepal 2011

Opening Ceremony

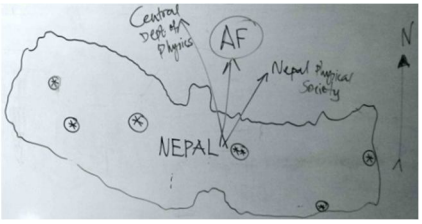
Participants working with module 4

Participants working with module 2

Cooking lunch for the workshop

Exploring spectrometers during lunch

Relaxing at the workshop dinner



Distribution of kits

Official ALOP Nepal 2011 photo

Dawn view of the Himalaya