EDU NANAO project- Ben Gurion University Final report

1. Dissemination Activities

BGU took part in most of the dissemination events:

1. Invited lecture by Dr. Tsiona Elkayamr from BGU about future drugs- based on the Edunano course: "Nanotechnology- Journey through time and space towards the future drugs"
2. IVS conference in Israel via booth describing the activities.
3. Presentation at NanoIsrael conference 2016 in Israel via booth describing the activities

Student Mobility Feedback

Torino Program

The workshop started as scheduled at the morning of Monday 18/7, Prof. Demarchi was kind enough to wait for us at the entrance to the university as everyone arrived.

It seems there was a bit of miscommunication with regards to the structure of the course:

Before arriving we were told that we would have to choose between the two parts of the workshop, yet upon arrival Prof. Demarchi told us that the workshop's parts are inseperable, this was somewhat problematic as most (if not all) students only did one of the two preliminary courses online.

The first part of the workshop which focused around Theoretical models for molecular devices was very interesting, and taught Core definitions which were important for the following classes.

The second day (EE-BESD and MotorDuck) was interesting, yet I think much more could have been gained if everyone did not need to learn everything from the complete beginning – from my impression none of the students had any relevant background in atomic (or molecular level) simulations, or any background in working with Octave.

Due to the lack of experience on our part – I feel we gained very little from the simulation classes. So I would recommend either changing the content to more basic learning material or make sure the students have a more relevant background.

All the rest of the classes (NanoGaps, Laboratory Tours etc) were fascinating and showed a lot of very interesting characterization methods which definitely expanded my knowledge and interest in this field.

Grenoble Program

Experience at Minatec Workshop, Grenoble France

Our over experience was very good, Grenoble is nice city with nice atmosphere and landscape.

 The workshop itself were four days

Day 1 and 2 : Clean room facility : integrated semiconductor device fabrication

Day 3 : Electrical characterization of integrated semiconductor devices

Day 4: Computer fabrication simulation

During all the workshop we worked on small groups of 4-8 people, which made the experience very nice and comfortable, we felt free to ask questions, and to leave comments.

Day 2 were full day and the other days were half days, we had weekend off in the middle of the Workshop, during the first days we worked in the teaching dedicated clean rooms, and got all the necessary equipment for the fabrication process.

The workshop transmitted by 3 different persons, all of them had good English skills, everything they explained was very clear, and every question we asked, got answered.

We made friends from different universities across Israel and we learned about their research.

For conclusion, we feel the workshop very contributed to our knowledge.

EduNano survey results

In the framework of the EduNano program, two different courses were offered in a pilot project at Ben Gurion University:

1. **Advanced Topics in Photonics and Electrooptics**

   Students participate regular classes first and were provided with a recorded version of the lecture afterwards. It enable them to review the class as often as they wanted and hence, repeat what they might not have grasped the first time

2. **"Nanotechnology- Journey through time and space towards the future drugs"**

   Flip-course: students were asked to watch the recorded lecture before the lecture and in the following class there was a short overview of the main subjects of the lecture and based on that a discussion on advanced issues and research questions on the same topic.

Pilot course session survey results:

After completion of the courses, the students were asked to fill in a survey to evaluate the quality of recordings and the added value of on-line learning.

- Fourteen questions asked the students to grade the quality of the course in term of If it was interesting, if it expose them to new different features of the courses on a scale from 1 to 5 .

- Furthermore, they could write comments on the combination of the recorded lessons with the standard courses.

1. **Advanced Topics in Photonics and Electrooptics**

   The course was tested 2 times with 19 students participating- in total.

   The overall score of the course was 4.6 out of 5!

2. **"Nanotechnology- Journey through time and space towards the future drugs"**

   Out of 17 students that participate in this course, 12 answer the survey. The overall score of the course was 5.42 out of 6!

   In their comments, students wrote that it was anew studying experience for them and stated that they enjoyed it and that they think this model should be adopted to other courses (App. 2 in Hebrew).

   The following table summarizes the profile and the numbers of participates in each course.

Course Title		Advance topics in nano-photonics	Journey through time and space toward the futures drugs
Course Level	BSC		X
	MSC	X	
	PhD	X	
	Industrial		
	Teachers		X
	High School		X
Participants in Pilot Test (Course Attended by)	Total	19	18
	Females	1	16
	Males	18	2
Grade Distribution (in %	A - Excellent	30	7
	B - Very Good	55	7
	C - Good	10	1
	D - Passed	5	0
	F - Failed		3

The students agreed that the recorded sessions, should be used as start point for each lecture and that during the lectures an advanced issues should be discussed – base on the knowledge they gain from the recorded lectures.

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Conclusion

In a world where technology is making giant strides, teaching methods must adapt, evolve, and take advantage of advanced technologies. The ability to use videotaped lectures allows us to expose an unlimited number of high school students and students to the best experts and lecturers in every field. But most important, it and allows lecturers to evolve from a "source of knowledge" to guides that help students explore new ideas and provide data processing tools and ultimately educate a generation of thinking people who can acquire knowledge before entering the classroom and use the lecture time for advanced discussions.