



## Department of Physics and Astronomy

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### UMSAEP UM-UWC Linkage Report

Visit to University of Missouri, Columbia

September 15 to October 5, 2015

Towards Building a New UM-UWC Collaboration to Build a Sustainable Teachers Development Training Program for Senior Phase Natural Science Teachers Based on UM Experience

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Thanks to support from the UMSAEP linkage program which made my visit to Missouri University (MU), Columbia was a successful and good experience. During my three weeks stay, I visited the Department of Physics and Astronomy, the Education Faculty, a high school and attended the 30<sup>th</sup> UMSAEP UM-UWC Linkage Program anniversary celebrations.

The main reason for my visit was to meet with Prof Meera Chandrasekhar and her colleagues to establish collaborations in addressing training and developing of natural science physical science teachers. Specific aims for the visit were to: 1) share expertise with MU on how to setup a pedagogical base and sustainable teachers' development program for in- and pre-service of natural science physical science teachers, 2) approaches to successfully develop teachers to deliver effective teaching and learning, 3) enhance teaching and learning using technology and other modern approaches and 4) establish collaborations locally, nationally and internationally to share best practices in physics education training and development.

In my first week of visit I had the privilege to meet dedicated teachers of physics who all had wide-ranging experience in the education of pre-service, in-service teachers and undergraduate physics students. Three of them have won Kemper awards (Chandrasekhar, Hanuscin and Kosztin), two have won Presidential Teaching Awards (Kosztin and Chandrasekhar) and one has won the Robert Foster Award for Great Teaching (Chandrasekhar). It was a great opportunity for me talking to them about their teaching and learning experiences and sharing their enthusiasm and passion for teaching and learning. I also attended a session of the Elementary physical science in-service teacher professional development program, QuEST. QuEST is a 2-week summer program for teachers and students. I observed and engaged with the teachers as well as the facilitators of the program, Debi Hanuscin and Karen King. I had discussions with teachers about their experiences in the program. They were all very positive about the program and reported that the program enriched them and empowered them to deliver more effective and quality teaching and learning in their classes. I also had the opportunity to meet Mr Doug Steinhoff, the Teacher in Residence in the Physics Department. I had useful discussions with him about his experiences of being part of the department and his role within it. I visited with him one of the schools with whom the department works closely. I was very impressed with the resources of the school and all the support which were available to assist learners as well as teachers. For the program which I envisaged at the University of the Western Cape (UWC) I definitely see a teacher in a similar role to that of Mr Doug Steinhoff.



For the rest of the three weeks I attended lectures of their undergraduate programs. The undergraduate main stream program was a fairly big class of about 200 students. I also attended weekly seminars which they have for all their undergraduate students majoring in physics. The seminar sole purpose was to stimulate the students interest in physics, finding out how they managing their studies and provide students with information about possible career paths in physics. I definitely see something like this which can be of use to our students at UWC. It will also build closer relationship between staff and students majoring in physics and show that the department cares about them. Most of my time I attended the Elementary pre-service physics class, Physics 2330. This is a course for elementary and early childhood majors, is a hands-on discussion oriented class that has been offered at MU for 15 years. Inquiry and modeling techniques are used in this class. Here I have observed and learned most. I had useful discussion with the facilitators and teaching assistants of the course. I will adapt most of teaching and learning approached of the program to the one I envisage for UWC. The last week of my visit involved discussions in setting-up collaboration between the Departments of Physics and Astronomy of MU and that of UWC with the Metro Educations Districts in Western Cape in developing a pilot project for Modeling Instruction for senior phase natural science teachers.

The exchange program has allowed me the opportunity to personally benefit from interaction with staff and students at the Missouri University, Columbia. I had the opportunity engage with physicist who are enthusiastic and passionate about teaching and learning and who was willing to share with me their experience and knowledge of how to go about setting-up a sustainable development training program for teachers and learners. Also they were interested to collaborate with me on this program. My visit to and interactions with Prof Meera Chandrasekhar and her colleagues lead to the establishment of collaborations between the Departments of Physics and Astronomy of MU and UWC and the Metro South Educations Districts in Western Cape on a three year pilot project for Modeling Instruction for Senior Phase Natural Science Teachers. It is envisaged that this project will have significant impact on the teaching and learning of physics in the senior phase of the natural sciences in high schools. I believe this is the beginning of a long and fruitful collaboration.

Lastly I would like to express again my appreciation towards the UMSAEP UM-UWC Linkage program who made my visit possible, especially Prof Rodney Uphoff and the Office of the President of MU (Ms Brenda Dennis), and the International Relations Office at UWC,



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