



King Abdulaziz University Mathematics Development Program (KAUMDP).

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In this talk we describe how King Abdulaziz University (KAU) is enhancing its research and academic programs in Mathematics within its five campuses where it has the strength of more than 100 mathematicians.





The KAU strategic plan for research:

Reinforcing and increasing the productivity of quality research and investing in its outcomes.

In particular the plan aims to:

- Increase the production of high quality research publications for all ranks of academics.
- Support and encourage joint research projects with local and international universities.
- Invest in applied scientific research.
- Motivate and stimulate its academic staff toward more innovative creativity, and a goal is to obtain patents to win local, regional and international recognition.





Research Groups are Building Blocks in KAU strategic plan

The research team of

“Nonlinear Analysis and Applied Mathematics (NAAM)”

proposed and initiated a strategic program based on the KAU strategic plan to ensure quality-oriented research in mathematics and academic performance,

under the umbrella of the

“Mathematics Development Program (MDP)”.





Four components of KAUMDP

The NAAM research group launched the KAUMDP program in 2010 with the following ingredients:

1. Distinguished Scientists Program.
2. Bulletin of Mathematical Sciences (BMS).
3. Research and academic collaboration with international universities.
4. Establishment of a research center of excellence.

These four components were extended to the whole University under the “Distinguished Adjunct Program” with the motive to provide guidance to the new research groups.





The first component

Distinguished Scientists Program

The aim is to invite distinguished professors from all over the world to organize series of talks and crash courses and to collaborate in research with local faculty members.

- KAU has organized more than 500 seminars and crash courses in mathematics with the aid of distinguished adjunct professors.
- KAU funded about 100 research projects in mathematics for the last 5 years. Each project was for 1-year period and involved three local faculty members working with distinguished adjunct professors.
- KAU faculty members collaborated with Fields Medalist Prof. Efim Zelmanov on a hot topic of research in algebra, and participated as speakers in various important international conferences such as the International Congress for Mathematicians (ICM).



The second component

Bulletin of Mathematical Sciences (BMS)

A top class journal with distinguished editorial board was launched by NAAM research group four years ago.

It has developed into a prestigious journal as it has published articles of the highest quality including some from Fields medalists and other celebrated mathematicians.

Based on the high quality research published in this journal, it is now listed in the ISI database within the short span since its inception.





The third component

Partnerships with International Universities

KAU started many partnerships with international universities to collaborate in excellent academic activities and research of high quality.

- KAU is seeking to offer graduate programs to prepare students for work in solving real life problems. In this direction it started a high quality graduate program in Biomathematics in collaboration with University College London (UCL). It is supervised by the NAAM Research Group at KAU. This joint venture led to excellent research projects in Bio-Math involving KAU faculty members and students.
- Another fruitful partnership is with Ohio University Center for Ring Theory and its Applications in an exchange of professors and research collaborations.





The fourth component

Establishing Research Centers of Excellence

NAAM research group has contributed significantly to the research output of KAU over the past five years, and is known to be very strong in international circles. The performance of this research group is indeed reflected by the following achievements:

- 1) The approval of four research projects by King Abdulaziz City for Science & Technology (KACST), the major research funding agency in Saudi Arabia. This agency only approves a project after strict evaluation by prestigious international scientists, such as AAAS in United States: the approval percentage is about 25%.
- 2) NAAM research group members completed 40 research projects funded by KAU in collaboration with their international members, with an output of over 150 research papers published in ISI journals. Moreover, a great number of research articles by our local mathematicians are under review in topmost journals.



The fourth component

Establishing Research Centers of Excellence

- 3) Professor Bashir Ahmad Mohammed, a local KAU member of NAAM research group, became a highly cited (HiCi) researcher in 2014 according to Thomson Reuters.
- 4) Members of NAAM research group supervised 32 graduate students in last five years (and more than 70 mathematics graduate students were supervised in last five years).
 - Some of those graduate students received a distinguished research award from KAU.
 - Two of those graduate students received the first and second position awards in the National Students Conference Competitions.
 - All those graduate students published papers in ISI Journals using results from their theses.
 - Some of those graduate students have been involved with distinguished adjunct professors in research projects or an online reading course.



The fourth component

Establishing Research Centers of Excellence

- 5) Members of NAAM research group used their research skills abroad as visiting professors in the distinguished adjunct professors' universities.
- 6) Graduate text books were co-authored with the distinguished adjunct professors. These books will be translated into Arabic at a later stage.
- 7) Many members of NAAM research group have been involved with various special issues of JCR journals.
- 8) NAAM research group has encouraged and facilitated ten young researchers, who have obtained their PhD degree recently, to interact with the foremost scientists in the group.
- 9) Many international channels for research and academic collaborations have been opened.





The fourth component

Establishing Research Centers of Excellence

In view of the great success of NAAM research group in a variety of research areas, a proposal is being forwarded to facilitate the upgrading of this research group to a research center in which there will be places and positions for postdoctoral fellows, visiting professors, and full-time researchers, with more facilities and funds for various research activities.





Extending the program to the whole University

In 2011, KAU decided to extend the following components to the whole University.





KAU Distinguished Scientists Program

KAU recruited distinguished scientists from all over the world in many different subjects: Medicine, Engineering, Sociology, Chemistry, Physics, Biology, and so on.

KAU funded over 400 research projects submitted by local members of KAU, with the collaboration of distinguished scientists, in the last four years.

This program won approximately SR 200 million from external research funds:

- KAU was approved for more than 100 research projects funded by KACST.

There were many other similar achievements e.g. KAUMDP.





Launching Scientific Journals

Following the idea of Bulletin of Mathematical Sciences (BMS), KAU is now planning to launch five new research journals in the following disciplines:

1. Medical Sciences.
2. Geosciences and Environment.
3. Engineering & Computer Science Technology.
4. Life Sciences.
5. Social Sciences and Humanities.





Seeding research groups in the same manner as NAAM:

KAU now has 45 research groups and continually evaluates their performance, setting regulations for research groups to be transferred to research centers of excellence. Some of the active KAU research groups are:

1. Biotechnology.
2. Renewable Energy Group (REG).
3. Communication Systems and Networks.
4. The Effects of Environmental Pollutants on Prenatal and Postnatal Development.
5. Advances in Composites, Synthesis and Applications.
6. Medicinal Plants.
7. Applied Algebra in Coding Theory and Cryptography.



Concluding Remarks

We have seen that the NAAM Mathematics group and in particular their progressive KAUMDP program has been a strong force in the general research environment at King Abdulaziz University, Saudi Arabia.

