

GRADUATE RESEARCH ASSISTANTSHIPS IN DEVELOPING COUNTRIES

Ph.D. in Mathematics, COMSATS University Islamabad (Lahore Campus), Pakistan



International Partner: **Volkmar Welker**, Philipps Universität, Marburg, Germany
Principal Investigator: **Sarfraz Ahmad**, COMSATS University Islamabad, Lahore Campus
Supported Students: **Hafiz Muhammad** (Ph.D.), **Safdar Ali** (MS), **Arooj Jamil** (MS), **Alia Yasin** (MS), **Muneeba Muhammad Mansha** (Ph.D.), **Areeba Maqbool** (Ph.D.)

CONTEXT

Students in developing countries still face many challenges, including limited research funding, lack of international exposure, and financial constraints. Many MS and PhD students in Pakistan continue jobs alongside their studies, which makes it difficult for them to fully focus on research activities. In this context, the GRAID program has been highly valuable. The program provides research opportunities, international collaboration, and academic support to graduate students. It also helps to attract motivated students toward higher studies in mathematics and strengthened the local research culture.

CDC SUPPORTED ACTIVITY

The activity carried out under the GRAID program supported PhD study and research collaboration program at COMSATS University Islamabad (Lahore Campus). The program supported four MS students and three PhD students, among which three were male and four were female students. All students were supervised by Sarfraz Ahmad in collaboration with Volkmar Welker. The activity promoted research supervision during weekly online meetings and mutual visits including the supervised students. In addition, it strengthened the long term cooperation in mathematics between Pakistan and Germany.

IMPACT

The GRAID supported activity contributed significantly to the development of research and academic skills among students and faculty members. Graduate students improved their abilities in mathematical research, scientific writing, problem solving, and research communication. The collaboration also strengthened supervision experience and enhanced the research environment within the Department of Mathematics at COMSATS University Islamabad, Lahore Campus, Pakistan. The partnership with Volkmar Welker and Philipps Universität Marburg created valuable international academic connections and opportunities for future collaboration. Through this support, one PhD student and four MS students have already completed their degrees successfully, while the other students are on track to complete research work and their degree.

Overall, the program demonstrated the importance of international support initiatives like GRAID for developing countries, where many students balance higher education with professional responsibilities. It has played an important role in encouraging talented students toward advanced studies and research in mathematics.

OUTCOMES AND ACHIEVEMENTS

- Seven graduate students (4 female and 3 male students) trained and supervised
- More than 20 academic activities, in the form of courses, workshops, and seminars delivered
- Established and sustained collaboration with Philipps Universität Marburg through Prof. Volkmar Welker
- Graduated students secured PhD admissions in Italy, while current students participated in academic visits to Germany and France
- Six research articles published in international journals



REFLECTIONS

The GRAID supported activity has played an important role in strengthening mathematical research and graduate training in Pakistan. It provided students with research opportunities, international exposure, and academic mentoring that are often difficult to access in developing countries. The program contributed to building long term research capacity by training young mathematicians, strengthening international collaborations, and encouraging students toward higher studies and research careers in mathematics.

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