## **Effective Professional Development Programs**

The quality of teachers and their teaching are critical contributors to the success of educational systems. Numerous studies have demonstrated that student performance improves if the quality of teaching is improved. Consequently, teachers should be given opportunities for continuous professional development in order to improve the quality of their teaching. However, research has shown that in-service activities in which teachers are expected to learn a clearly defined body of knowledge and skills through a well-specified process, often delivered in one-time workshops or courses taught away from the school premises are not effective. Conversely, educational research suggests that effective teacher professional development should include ongoing activities, follow-up, study groups, reflection, observations, and assessment in order to be successful. Effective professional development should also be highly applied, practice oriented and intensive. It should address teachers' and students' needs, focus on student learning outcomes, model learner-centered instruction, use formative and summative evaluation, and be long-term, appropriately sequenced, cumulative, and technology-based. More specifically, professional development programs for teachers of math and science should focus on both content knowledge in the math and science subject areas, as well as training and follow-up on pedagogical content knowledge. In summary, teacher professional development programs should be content-focused, linked to classroom practice, school-based, and continuous. The structure of the program should be collaborative and should build strong working relationships among teachers. Finally, it should connect to, and align with, other school initiatives, improvement priorities, and goals.

أ.د. صوما بوجوده أستاذ التربية العلمية الجامعة الأمريكية ببيروت