

Raspberry Shake, EQ1, and Research-Grade Seismographs: Pros and Cons of Different Types of Seismographs for Education, Citizen Science, and Earthquake Monitoring in New England and Texas

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The Texas Educational Seismic Project (TX-ESP), and the Boston College Educational Seismology Project (BC-ESP), share a collaborative mission to turn real-world phenomena into teachable moments for students of all ages and socio-economic backgrounds. In pursuit of our mission, both TX-ESP and BC-ESP use seismology as a medium for inviting students into the world of scientific research and for promoting inquiry-based learning through investigation of earthquakes recorded by classroom seismographs. Seismographs-in-schools programs, which grew out of efforts to enhance science education through seismology, resulted in many seismic stations operating in schools (and now in other public venues). As these seismographs-in-schools-programs developed, an inevitable question was raised: Are the educational seismographs used in these programs only suitable for educational purposes focused on large, globally-recorded, earthquakes, or could they also serve as additional instruments for monitoring smaller earthquake seismicity in regional settings? The recent development of the low-cost “Raspberry Shake” (RS) seismograph, which has an instrument response in the frequency range necessary for regional monitoring, provides opportunities for RS seismographs to serve as additional stations for regional seismic monitoring. Here we explore the extent to which the RS seismograph compares with the EQ1 educational seismograph and with more expensive, research-grade seismographs commonly used for regional seismic networks and global monitoring. We find that the affordability, flexibility, and technical capability of the RS is well suited for recording both regional earthquakes and more distant global earthquakes, thus enabling an opportunity for students of all ages and socio-economic backgrounds to monitor and study earthquakes “in their own back yard” as well as across the globe.

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