Osiris: The Study and Evaluation of Piezoelectric Effect as a Renewable, Clean Electric Energy Source Through an Energy Harvesting Footsteps-Powered Platform

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The search and implementation of less polluting alternatives of energy production has been more demanding, as the long-term impact of human beings on our environment becomes more visible. That's where piezoelectricity, the main focus of our project, comes in. Piezoelectricity is a phenomenon that offers the convenient characteristic of producing an electrical charge, when certain crystals, such as quartz or piezoelectric ceramics, are subjected to mechanical pressure. In order to use it appropriately, we carried out the development of a platform, with piezoelectric (ceramics) generators as the main element, in which we experimented with finger touches and footsteps as a way of harvesting clean energy by converting mechanical energy into electricity, and then, storing it for further use. Through this, we sought to demonstrate that piezoelectricity is a reliable, productive, effective, and economic way of energy harvesting, in comparison to other unconventional clean energy sources, like solar and hydroelectric power, for instance. Based on our lasts experiments and with provided data, we could calculate that our platform could be able to produce up to 2,000,000 (million) volts of energy with only ten thousand steps; leading us to believe that piezoelectricity is, in fact, an effective energy source and a valuable field of study that needs more attention and commitment, due to all of the benefits it could provide to human beings.

Awards Won:
King Abdulaziz &amp
his Companions Foundation for Giftedness and Creativity: On-line Mawhiba Universal Enrichment Program
King Abdulaziz &amp
his Companions Foundation for Giftedness and Creativity: Award of $500