The polymer composites based on low-density polyethylene (LDPE), ethylene vinyl acetate copolymer (EVA) and fly ash (FA) without and with vinyltrimethoxysilane (VTMS) modification were prepared by melt mixing in a Haake Rheomixer. The FT-IR spectra indicated the bonds between LDPE/EVA and FA modified by vinyltrimethoxysilane were dipole - dipole interaction and hydrogen bonding. Both dynamic storage modulus (G’) and loss modulus (G’’') of the LDPE/EVA/FA-VTMS composites were higher than those of the LDPE/EVA/FA composites. The tensile strength and elongation at break of the LDPE/EVA/FA-VTMS composites were also higher than those of the LDPE/EVA/FA composites. The FESEM images proved that FA-VTMS particles disperse more regularly in the polymer matrix in comparision with original FA. In addition, the surface modification of the FA reduced the size of agglomeration of FA particles in polymer matrix.