

Suggested Changes to Create Partner Relationships Between Universities and K-12 Institutions

Characteristics of initial efforts in Outreach (commonly implemented)	Recommended aspects for an enduring model of Partnership (suggested changes)
Reform of K-12 science education	Reform of K-20+ science education
Provider-Recipient model in which university scientists provide content expertise that K-12 educators receive	Mutual Learning model in which university scientists gain pedagogical skills and insights, and K-12 educators learn about the culture, content, and process of science
Individual, isolated science education programs and efforts	Institutionalization of multiple, coordinated programs and efforts within university science departments and K-12 school districts
Science education efforts as optional service by some scientists within some universities	Science education efforts as an integral part of the scientific endeavor in universities that is acknowledged and rewarded
Universities develop science education programs that are offered to K-12 schools	Universities and K-12 schools collaborate to determine disconnects across the K-20+ continuum of science teaching and learning and work together to develop mutually beneficial programs
Universities and K-12 schools operate in isolation	Universities host teachers learning scientific content and experiencing research, and K-12 schools host scientists learning pedagogy

Figure 4.

(Adapted from: Dolan, E, and Tanner, K. Points of View: Effective Partnerships Between K-12 and Higher Education: Moving from Outreach to Partnership: Striving for Articulation and Reform across the K-20+ Science Education Continuum. *Cell Biol Educ* 4(1): 35-37 2005. <http://sepal.sfsu.edu/research-pubs.html>)