EXPERIENTIAL LEARNING OPPORTUNITY (ELO) AND UTILIZATION OF FIELD-AND-DATA-BASED INFORMATION OBTAINED THROUGH THE INFUSION OF TECHNOLOGY: HIGHLIGHTS ON NASA STEM AND EARTH SCIENCE CURRICULA

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Summary

There is a greater emphasis on hands-on involvement and critical thinking skills in the geosciences and other STEM fields to inspire and engage K-16 students to value scientific content and enable them to discover the well-documented nature of the fundamental scientific principles needed to explain various earth science and other STEM-related core phenomena. NASA MUREP (Minority University Research and Education Program) Aerospace Academy also known as MAA curricula are ideal for engaging K1-16 students in this context, since grade-specific lesson plans open up a plethora of pedagogically sound and relevant earth science activities. These include earth’s materials and properties, meteorites, crystal growth, robotics, coding, hot air balloon, flight simulation, star gazing, material science, density measurement of various objects, aerodynamics, liquid nitrogen and other cryogenic activities, weather tracking, measuring air turbulence via wind tunnel activities, etc.

Real-time, hands-on activities built upon fundamental physics, chemistry and mathematical principles; create an opportunity for the participating students to appreciate the relevance and importance of STEM activities across the curriculum. Furthermore, these enable students to acquire strategic and pivotal knowledge towards fulfilling one of the core underlying pedagogical components labeled as critical thinking skills. One of the advantages of disseminating basic science concepts to the students is its powerful constraint on having group dynamics, time management, and understanding research methodology applicable to these activities.

Data collected on over 1000 students positively shows students’ liking and subsequent success in STEM education at an early age. In general, responses to items expressing positive experiences with science received high levels of agreement. Similarly, students gave high levels of agreement to items about the importance of science: 92% agreed that they are learning interesting things about science; 88% agreed that science is important for society and 88% agreed that science improves our live. Hands-on, field-based, critical thinking and ELO-related tasks are found to be a strong determinant in the evaluation matrix. Furthermore, respondents demonstrated enthusiasm for learning and indicated that they are engaged in science in ways that supplement and enrich their schoolwork.

Conclusion

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