

# An International Comparison of Family STEM Programs at Elementary Schools From El Salvador, Myanmar, Pakistan, the United States and Uzbekistan



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## Introduction

Family involvement in both STEM and STEAM programs is one important indicator of student interest and success in many STEM Fields. After school STEM activities, science fairs, and other STEM/STEAM events play important roles in how schools engage with students and their families in STEM education (Hunt, 2014). In this educational poster, four international and one American students participated in a primary STEM program for Grades K-5 at an elementary school in Southwest Utah and analyzed how STEM programs differ between countries. This poster concludes with ideas on supporting family engagement in diverse schools within an international context.

## School STEM Programs – El Salvador

Community organizations are truly important not only for students but also for families. These kinds of events help students improve their knowledge. STEM programs also provide vocational development for students. In El Salvador, there are two categories of STEM programs for children and families. The first one is usually based on learning activities hosted by members of the local University and community volunteers similar to the program I observed in Utah where the university partners with an appropriate school with great facilities and provides lots of STEM activities for students and families to explore. The second type of program is a project-based STEM event where students bring and present many innovative projects (like a science fair). This event is called “Feria de logros” in Spanish. This event is one of the most successful and rewarding exhibitions in schools because it showcases students knowledge and skills. Research by Nagewaran (2020) suggests that these kinds of community-school partnerships can really enhance future classrooms for the benefit of participants since it offers excellent opportunities for communities to learn about the projects or even new programs as a form of inclusive multicultural education.

## School STEM Programs – Myanmar

STEM education is becoming more vital in the world and is displayed to nourish the students’ knowledge from the elementary level in schools. In a STEM event held at Coral Cliff elementary school, partnered with Utah Tech University, many K-12 students happily participated in practical experiments with their classmates and parents. The special thing in this event is the role of the organization, which is the partnership between the Elementary school and Utah Tech University. When the schools work cooperatively with higher education institutions, it can enhance STEM projects in the basic education level. In Myanmar, the organizers are the Students’ Clubs, from Technology Universities to STEM projects in the middle and higher schools. Although science and mathematics are mainly taught from elementary schools, the events are rarely seen held at the elementary level.

### STEM Nights in El Salvador



Students work on different projects and exhibitions throughout the whole semester so that they can present them on “La feria de logros.” They include science and biology projects.

Students are learning about how to properly use technology in class. They also learned how to use Microsoft Word, Excel, and PowerPoint.



ICC University invited students from different local schools to learn English.

### STEM Programs in Myanmar



I believe that STEM projects with diverse students from the world can bring the students not only the STEM education itself but also the cultural & social inclusion within individuals and societies to be more globalized.

### STEM Programs in Pakistan

Students from the STEM club performing an activity with a car to know about the parts and battery.



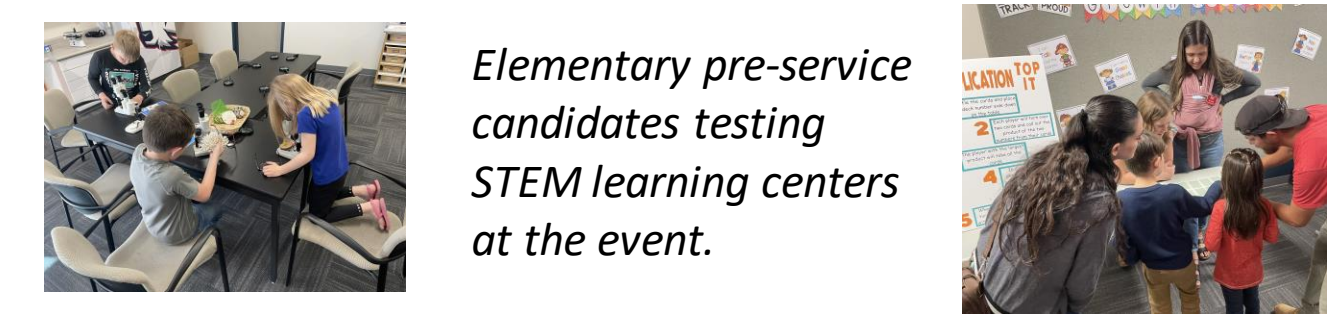
Elementary school students doing a math activity where they were collecting coins and dropping in a bucket and then adding the sum.



Kids collect balls of different colors to help themselves identify and name different colors and have fun at some time.



### STEM Nights in the United States



Elementary pre-service candidates testing STEM learning centers at the event.

Elementary students using stereoscopes from a university



Students and families exploring a wide variety of STEM activities together.

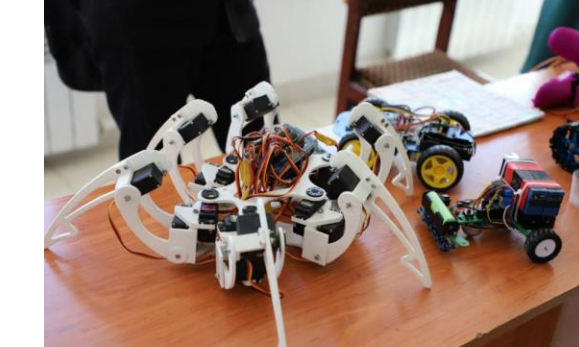
### STEM Nights in the Uzbekistan



The instructor and the young learners of the “Robots and Me” course have an engineering class. The visit of former Science and Tech Minister of Israel, Izhhar Shay’s visit to the STEM center.



A 7-year-old child is building his own robot after some instructions by Mukhiddin Nekbaev (founder of “Robots and Me”)



The display of a robotic spider created by a 12 and 9-year-old brother and sister for the final technology exhibition.

The students’ participation in both countries is high as they can sort things out by themselves through experiments. All in all, STEM education that is promoted in Coral Cliff Elementary school is inspiring with cooperation of the higher institutions. Myanmar should adopt these methods to have better STEM learning projects in the elementary schools.

## School STEM Programs - Pakistan

For me it was such a delightful experience to volunteer in Utah and learn about the education system and community projects in America as I am an international student from Pakistan. During the STEM night at the school, students were exposed to many activities such as DNA coding and microworld activities assisted by UTU students which helped the elementary students to learn and have fun at the same time. Students who completed all of the activities were treated with free Pizza. It was a wonderful experience where I saw students and parents volunteering for the betterment of society.

In Pakistan, we also have similar kinds of community projects. Students like myself volunteered at a primary and pre-school school in my town where we conducted STEM activities for preschool students. My classmates and I, with assistance from school officials, designed many learning activities such as matching the alphabets, colors and space craft activities. The experience I had in my country was slightly different from here because learning at the school in Pakistan was more transmissive in nature than hands-on explorations like the program I participated in Utah. Still, many Pakistani educators are making efforts towards positive and more student-centered changes in STEM education. I am excited to share my experiences participating and observing STEM and other elementary programs with my friends and colleagues back in Pakistan. I am sure they will be delighted to experiment with the new forms of learning and teaching I have experienced in the United States.

## School STEM Programs - Uzbekistan

Like the United States, there are similar interests and patterns in STEM education that can be seen in Bukhara State University, Bukhara, Uzbekistan, where teachers of the institution offer free STEM, Programming, and Robotics courses, called “Robots And Me” to children from the age of 7. During the course, students learn about basic programming and use Lego Robotics systems to build their own robots including coding them to operate. At the end of this course, students demonstrate their robots at the university. In general, even though the sphere of supporting STEM is not yet well-developed in many societies, the current efforts, in the examples we discussed show how communities are concerned about the interests and talents of children. Community STEM partnerships facilitate the educational process for both students and teachers and provide a more practical approach towards teaching and learning. The benefits of such partnership with schools are bilateral since the support of creativity, curiosity, and diligence along with science can help us fundamentally change our world and be the key to finding solutions to many contemporary problems!

## Conclusion

As illuminated in the diverse family nights from the various countries presented on this poster, STEM education and engagement should be considered as an important aspect of educational programs within international and multicultural contexts (Marginson & Titler, 2019). In research and sharing their experiences for this poster, the authors noted the importance of having educators from different countries working with each other to understand how STEM is taught differently around the world. As future educators, this will help us get to know and teach the diverse students we are working with. The information we learned from our research will also teach us new ideas and will help enhance our activities for learning and teaching the culturally diverse students educators work with. For STEM educators, it is also important to understand how culturally diverse communities engage in STEM learning and family sharing. STEM or STEAM requires active dialogue, cross cultural sharing and diverse partnerships within international contexts both locally and across the world which the members of this team hope to continue doing in their future research.

## References

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