



# INCLUSIVE LEARNING A SUPPORTIVE ENVIROMENT FOR STEM EDUCATION

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## ABSTRACT

People need to be qualified to adapt to innovations caused by the rapid change in information and technology. In this article, we study the STEM (science, technology, engineering, mathematics) education needs. Through STEM, learners develop new approaches, strategies and innovation activities and engage all learners in meaningful inclusive learning. Supportive environment provides creative ideas and hand on learning through STEM platform. One question arises here how to create inclusive learning culture supportive for STEM and see all aspects of creating culture through STEM platform. STEM education help to create inclusive learning culture to learner where all diverse needs and background of the learners create their own learning goals. Inclusive learning culture creates support between learner and their teams and it helps to understand the needs of learners to encourage discussion and listen to what people tell them they need. We use virtual reality as a supportive material for inclusive environment. The learner learns in a supportive environment free from prejudice and discrimination. Teaching and learning activities provide students with equal opportunities to learn, share experience and succeed at learning environment. In briefly, we discuss about the STEM education and their needs in inclusive learning and how it helps to create inclusive learning culture with diverse learners.

## KEYWORDS

STEM education, Inclusive learning culture

## INTRODUCTION

STEM (science, Technology, Engineering and Mathematics) is an approach to learning and development integrates the areas of the education. STEM education should be equally accessible and relevant to all (Felix, 2017). Through STEM, students develop key skills problem solving, critical thinking, planning, innovation, observation, collaboration and revision. STEM education help to create inclusive learning culture to learner where all diverse needs and background of the learners create their own learning goals. Inclusive learning culture creates support between learner and their teams and it helps to understand the needs of learners to encourage discussion and listen to what people tell them they need. This education has been used widely today in science, Technology, Engineering and Mathematics (STEM) fields.

**STEM education is an interdisciplinary experience-based approach to the process of exploring science, technology, engineering and mathematics (Education Development Center, 2018).**

Learners are taught academic concepts with real-world lessons. Application of science, technology, engineering and mathematics are used to make connections between the classroom and the world around us.

It uses multimedia and besides delivering content, also enables a high level of interaction among learners' content, teachers, peers and administration both synchronously and asynchronously.

In this article, we will explain, what the needs of STEM education are and how to be useful in inclusive learning. How to inclusive learning a supportive environment for STEM. Here, we will see the inclusive learning environment aspects regarding to STEM education. Firstly, we try to understand needs of STEM education.

### **NEEDS OF STEM EDUCATION**

STEM education objective is integrating multiple disciplines and trains students to use cross-disciplinary knowledge to solve problems. STEM education practice and develop their own teaching style and philosophy. It engaged the learners in critical reflection by considering issues from multiple perspectives. STEM programs promote a learn-by-doing approach, students participate in real-world projects with real-world consequences (Tekere, 2018). STEM can have different meaning to different people. STEM in higher education is somewhat straight forward. A student enrolled in a STEM related program, other than teacher education, is in a stand-alone STEM field. For example, if a student is majoring molecular biology, they will enter the STEM workforce as a scientist. They may or may not be exposed to technology, engineering and mathematics that specifically pertains to their field, but the chances are they will be exposed in some way shape or form. The main objective of STEM is to provide opportunities for students to problem solve and experience multiple modes of learning. Needs of STEM education, students are learning early how to be innovative creative and original when constructing authentic solutions to problems. Problem solving allows students to develop mental habits that will help them succeed in any field. Through STEM, students recognize how new technologies, and discover how new technologies affect us. STEM education focuses on related subject to another and it helps them to become better at research and critical thinking.

### **NEEDS OF INCLUSIVE LEARNING ENVIRONMENT**

This learning environment provides offers multiple pathways to achieve your own and others' current and future learning goals. This type of learning provides opportunities to develop your own and generic skills. Inclusive learning isn't connected inside the learning process but is also connected with the outside learning process.

“CULTURALLY RESPONSIVE PEDAGOGY BULIDS ON STUDENTS' PRIOR KNOWLEDGE.....making connections between what is known and what is to be taught and understood.” - JACQUELINE JORDAN IRVINE.

This culture helps to examine your assumptions, learn and use students' name, Model inclusive language, examine your curriculum. In inclusive learning environment, the teacher's contribution in students' values, helps the students to find different ways of explaining.

## **INCLUSIVE LEARNING AS A SUPPORTIVE ENVIRONMENT**

STEM emphasis collaboration, communication, research, problem solving, and creativity, skills that students need to be successful in today's world regardless of specific interest or career goals. Our learner can develop creative thinking patterns and develop an interest in STEM subjects only if we give them unique learning experiences. Teaching models that encourage conceptual thinking in classroom through interactive engagement and the use of visualization, simulations, and hand-on experiments can support learners to understand the scientific phenomena. STEM education gives priority to learners take challenges as opportunities to grow whether professionally or personally. Inclusive learning environment is playing vital role in learners' creativeness and STEM helps it. Through STEM, learners relate concepts to their real-life problem and it focused on skill-based learning unlike the traditional methods of learning which were focused on memorization techniques. Inclusive learning gives environment to learner who explore the integrated e--contents through STEM and enhance in their knowledge.

After COVID-19, we were switched education into virtual and hybrid education. We adapting to virtual education, especially for STEM subjects that demand more interaction in the classroom, is tough for everyone involved. Here we will be discussing how to STEM is useful for virtual education and they continue navigate virtual education. The role of teacher in STEM education is instructor or facilitator. The responsibility of the teacher is to guide and manage students in the classroom such that students are actively engaged in critical thinking and problem solving. Learners are naturally curious and can generate questions and attempt to solve problems presented to them. Teachers play a critical role in promoting curiosity, critical thinking, and problem solving by providing an appropriate level of information, structuring and guiding learning experience and adjusting level of difficulty of the tasks presented. When learners are using virtual conferencing platforms, teachers can bring in STEM experts who learners likely would not have had the chance to hear from before. This provides students an opportunity to hear and learn directly from professionals in STEM fields and get a better understanding of potential career. For example, a school could connect with a professional engineer to help assist in the teaching of a course. The primary teacher could still lead the class, but students would have the opportunity to talk the engineer, ask questions, and receive valuable feedback. Virtual STEM, students need some kind of interactivity, whether they are interacting with each other, the teacher, or some kind of technology or software. This interactivity component is important so learning is tied to a real-world application rather than it just being an abstract concept. Through virtual STEM activities teaching and learning is able to continue in any environment, whether students are remote, and hybrid or in- person. Learners are more challenged using manipulative or physically building something can have more confidence and enthusiasm to participate because of STEM education.

Environment is important for inclusive learning at the whole school level and high level of education it includes the curriculum and classroom levels. Through inclusive learning environment, learners accept the inter group relations in their learning. Inclusive learning helps the learners to communicate and consultative decision-making

strategies. This culture environment acceptance of diversity as normal and comfortable. The learner learns in a supportive environment free from prejudice and discrimination. Teaching and learning activities provide students with equal opportunities to learn, share experience and succeed at learning environment.

**Inclusive learning culture defined as inclusive learning which describe the range of approaches to teaching that consider the diverse needs and background of the students to create a learning environment where all learners feel valued and where all learners have equal access to learn (contact office for European Research Innovation and Education, 2023).**

During inclusive learning, learners' entitlement to a learning experience that respects diversity, enables participation, removes barriers and anticipates considers a variety of learning needs and preference. In this culture, supports and advises colleagues, learners and clients to encourage new and ongoing participation in learning opportunities.

### **SUPPORTIVE ENVIRONMENT CREATE INCLUSIVE LEARNING CULTURE FOR STEM EDUCATION**

Promotes learners to learn about their diverse backgrounds, remember to take the time to highlight what's offensive and distinction between cultural celebration and appropriation. When we create inclusive learning culture through STEM education. The teacher should build relationship with students learning more about our students' personal learning experiences and challenges can help us understand the barriers students may face in our classroom.

1. Teachers should be getting to know your students.
2. Teachers should reflect on your own teaching persona.
3. Teachers should consider the content and activities they plan.
4. The teachers can engage and support students from diverse backgrounds in STEM classes
5. Classroom should provide opportunities to learn other perspectives in an inclusive culture.
6. Make space for students to present evidence from hands on projected to their peers, explaining why their conclusion is the right one.
7. Teachers can provide students with experiences that demonstrate the day's lesson, then leverage those experiences to make learning come alive.
8. Respect diverse talents of learners who bring different talents and style of learning.

Inclusive learning environment motivates the diverse learners to create effective learning through STEM where barriers are minimized and learning supports and flexibility are built.

## CONCLUSION

Finally, we see STEM is working in integrated or inclusive learning culture and connect with professional working in STEM. What is needs of STEM education in our education and what is the needs of inclusive learning environment for STEM education? How to study inclusive learning environment as a supportive for STEM education. Present time STEM education is taking wider surface in our education system. Learners show interest in STEM education and they went to learn science, math, technology, engineering through virtual. They understand the subjects very easily, create their new knowledge and experiences that can prepare them for civic life and the workforce. In virtual education expectations and opportunities to learn STEM are set from the moment a child enters the classroom. Creating inclusive learning culture is an essential yet underdeveloped skills. In inclusive learning culture, teachers need time, tools, and supports to facilitate border participation in STEM learning. These are emerging educations in the global level who promotes the learner's qualities in education. These initiatives work on all learners who develop the critical thinking, problem solving, and develop their own learning approach through STEM education.

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