

Preschool Insights & Research

The importance of STEAM in early years education

“I do not feel intimidated by the terms STEM or STEAM because early childhood educators, including myself, are already covering all of the areas every day.”

– Victor Bradley, Eliot-Pearson Children’s School at Tufts University, Boston, MA

“Children love DIY materials to make their own inventions.”

– Kim Weldon, Education Supervisor, Action for Boston Community Development

STEAM – science, technology, engineering, arts and math – is a growing trend in early years education globally, and it isn’t just a buzz word. STEAM has a greater meaning, a purpose beyond teaching five subject areas. Educators like Victor and Kim are focusing on curriculum that inspires children’s creativity and critical thinking, and STEAM offers many opportunities for exploration and open-ended activities.

It is clear that early childhood educators know they are already covering these areas in their teaching, and seek out opportunities for children to use hands-on resources to facilitate their play and creativity. Research and guidance, such as Di Chilvers publication, *Playing to Learn* (2016), clearly shows the links between young children’s intrinsic motivation, skill development, and the availability of opportunities to discover the world for themselves.

STEAM learning with hands-on resources enables children to explore, build and share their understanding of the world around them, while the playful aspect of such resources keeps them intrinsically motivated to continue to learn, inside and outside the classroom.

Teachers also show a desire for children to create their own inquiries and experiments. They know the importance of learning the process and applying the skills, not just acquiring the knowledge and producing an outcome. Skills such as communication, collaboration and creative thinking are equally as vital for children to develop. Teachers are familiar with these types of activities, especially in early years settings, even if they don’t explicitly label them ‘STEAM’.

So why label it at all? And why STEAM not STEM?

In many respects, the STEAM label helps us to represent the eclectic mix of skills and knowledge under one umbrella. Hands-on resources used in the classroom with a STEAM label should be able to facilitate the whole spectrum of skills, allowing the teacher to cover many different disciplines, whilst being able to focus in on one curriculum area when the need arises. These resources are flexible and adaptable, which also makes them a better value in the long term.

The Arts are represented because early education standards encourage children to develop an appreciation of music, art, literacy, language, and a myriad of other social studies. Researchers agree that the best scientists and engineers are themselves musicians, painters and poets, for example. An added narrative and roleplay further engages children and increases their understanding of the world around them. Hardiman, Magsamen, McKhann and Eilber (2009) state that the integration of arts disciplines and arts-based pedagogy can improve learning and create deeper engagement, resulting in

better retention of content, a deeper social awareness, and an increased ability to apply skills across disciplines. The arts, when integrated into STEM lessons, better promotes all the critical 21st century skills.

The STEAM label is also for the educator. The 2017 *Early STEM Matters* policy report, created jointly by UChicago STEM Education and the Erikson Institute, says that children are often considered natural scientists and engineers. However, it proposes that they need adults to help develop these 'natural' STEM inclinations. It is the teachers that expose children to memorable experiences and select the resources that help them make sense of their world. The STEAM umbrella allows for diverse and rich learning and empowers the teacher with the sense that all areas of the curriculum can be mixed together. Play and hands-on resources encourage both the teacher and the learner throughout the process and make teaching and learning fun and rewarding.

When teaching strategies based on research about how children think and learn are combined with the creative approach of STEAM in early years classrooms, the obvious benefits of cross-curricula teaching emerge. The way to achieve these are highlighted in the findings of Hardiman, et al (2009), the three most relevant to STEAM learning being:

- Be flexible in instructional design and promote innovation
- Explore the nature of creativity and apply it to help transfer knowledge and skills
- Understand the nature of arts learning and how it can help understanding and retention of knowledge in STEM

What the teachers say

“The need for open-ended creative STEAM resources is essential for preschoolers because a lot of the STEAM-related products available are very specific and do not allow for multiple solutions. Children are inquisitive investigators, always looking to see how things work and how to make things happen. By giving them resources that foster investigation, problem solving, manipulation, and cause and effect scaffolds their STEAM skills early in life...so later they may become great engineers!”

- Kim Weldon, Education Supervisor, Action for Boston Community Development

References

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