Overcoming challenges in a STEM classroom using a drama in education approach: An exploration of imaginary and objective thinking.

Eve Filea, MEd Drama in Education (TCD, 2015), MPhil Consciousness & Embodiment (UCD, 2019).
A research project under the supervision of Prof Carmel O’Sullivan and the support of Trinity Walton Club for STEM education.

Contact info: fileap@tcd.ie / paraskevi.filea@ucdconnect.com

Introduction

This research project set out to investigate whether drama in education can assist at achieving the two major goals of Science, Technology, Engineering and Mathematics (STEM) education; a, STEM interdisciplinary learning and b, real-world problem based learning. This enquiry was developed upon the hypothesis that drama is by definition connected to human conflicts so it naturally embraces problem based learning. Also, in educational drama, knowledge is based on human action which is always holistic and cross-disciplinary so it might have the potential to promote learning across all STEM disciplines. In addition, based on Edward Bond’s theory of imagination and objective conception of reality, this study attempted to examine whether drama, being an art form, can align with scientific thinking in a STEM environment. More specifically, this research aimed to explore the scientists’ reaction towards an educational drama approach, which is holistic and cross-disciplinary so it might have the potential to promote real-world problem based learning.

Main challenges of STEM education

Challenges at achieving STEM interdisciplinary learning.

STEM teachers often don’t know how to design and apply interdisciplinary programs.

STEM teachers often think it’s unrealistic to integrate all sciences in one session.

In a school setting, the categorisation of scientific knowledge into disciplines creates inflexible boundaries to any effort to develop integrative science and maths programs.

Challenges at achieving STEM real world problem based learning.

The STEM teachers often find it challenging to find a problem upon which they could develop a problem-based lesson plan.

Textbook real world scenarios often fail to present real life applications as they usually lack human element.

Research Questions

Can drama as a teaching and learning methodology:
Help achieving interdisciplinary learning among the STEM strands?
Help promote real-world problem based learning in a STEM classroom?

How do STEM tutors respond towards drama as a teaching & learning methodology in their subject area?

Research Methods

Literature review of the fundamental theoretical and practical tools of drama in education.

Semi-structured interviews with the STEM tutors.

Observation notes before and during the intervention, including non-participant observation.

Data was gathered from 10 drama sessions, with 2 groups of 65 teenagers. 6 STEM tutors, all researchers at the TCD School of Physics with no prior drama experience, were invited to get involved in the design and implementation of the drama sessions.

STEM tutors’ response to drama

All tutors despite having any prior experience in classroom drama, got very actively engaged with the STEM drama sessions planning process, such as co-deciding the fictional frame and assisting at creating the resources.

50% of the tutors said that drama helped the students to better understand a STEM problem.

50% of the tutors would use drama again to show the application of STEM skills in a real life context.

Young participants’ response to the STEM drama

All tutors agreed that drama has the potential to work as a framework for problem-based STEM learning.

All tutors agreed that they can achieve STEM interdisciplinary learning through drama.

Discussion

Is imaginative thinking, in the simple form of thought experiments, or in the more complex form of theatre; able to co-exist with objective thinking?

able to help at scientific concept understanding?

able to produce scientific knowledge?

References


