



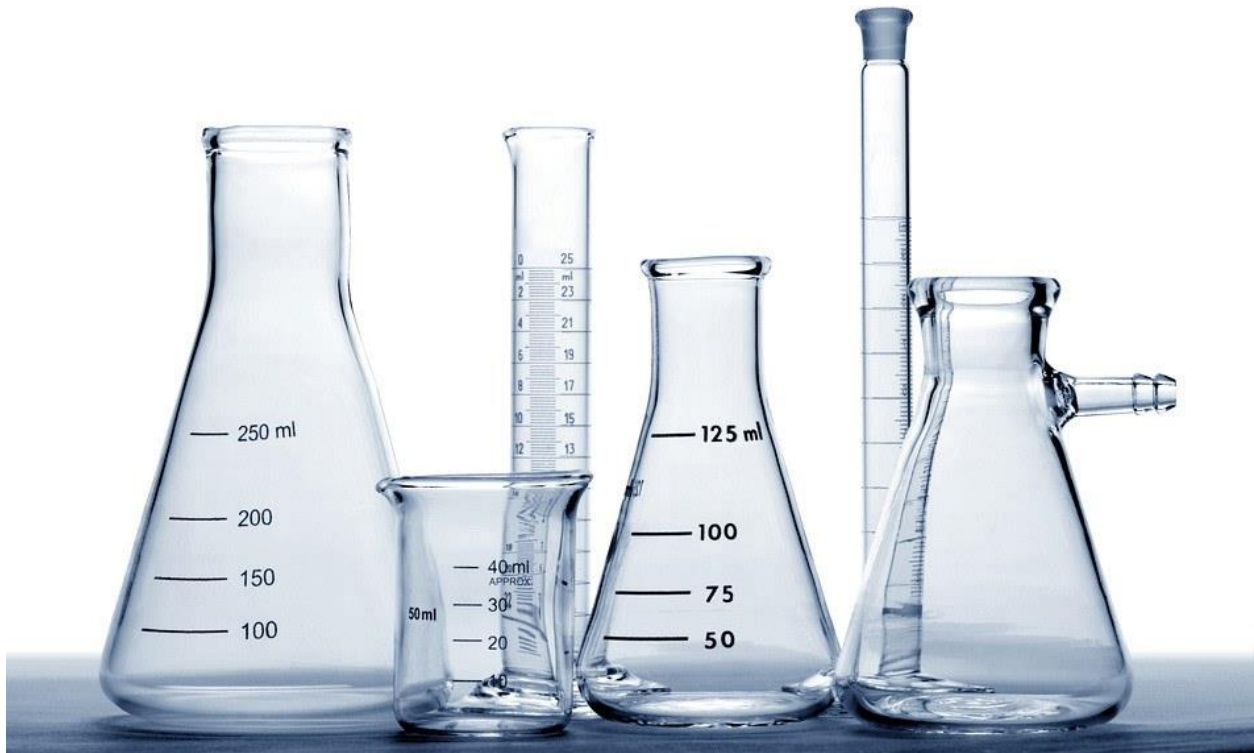
## Creative Approaches to Teaching

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*The definition of creativity has long been debated; however, earlier, and recent academic studies conclude that to be creative, one's ideas must be original and useful (Barron, 1955; Diedrich et al., 2015; Kaufman, 2016). The need for creativity has been brought to light by the new curriculum for Wales which has four main aims; one of them being to produce enterprising and creative individuals (Welsh Government, 2022). Creativity harbors innovation and the need to solve problems which is profoundly important currently, in a time which is full of uncertainty and change. To produce well-rounded, creative and enterprising contributors, educational authorities must encourage creativity in all its forms.*

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## Science and Creativity



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*Science and creativity are inherently linked, as Einstein and Infeld (1940) quoted, “Physical concepts are free creations of the human mind”. This suggests that to come up with theories and inventions one must think creatively, by using imagination. Leonardo Da Vinci is a prime example of someone who combined art, science and engineering, becoming arguably, a creative genius. In science, children are taught to think critically, analytically and logically. These skills are all essential in applying scientific methods. Thus, creativity is evolved cognitively through abstracting and synthesizing information to solve problems. This would be supported by Vygotsky’s theory that science is impossible without imagination and that the essence of play is to create imaginary situations (Vygotsky, 2004). In short, our imaginations are the driving force behind creativity, (Fields, 2022).*

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## Scientific Play

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*Scientific play is one creative approach in education which combines play and exploration. Science inquiry extends beyond the practice of science-process skills, such as observing, measuring, and predicting as it also practices reasoning and critical thinking in a social context in addition to science-process skills (Lederman, Lederman, and Antink 2013). Children are naturally inquisitive, and it has*

*become more recognized that play is essential for their learning and development. To be able to play creatively, children are free to experience something for themselves, in a fun and engaging environment. Piaget's theory is that play should encourage further psychological development and that playing outside can incorporate all areas of learning to make children aware of their surroundings (Piaget, 1971). Studies indicate that incorporating scientific play into education allows for children to participate in science inquiry as "active producers and users of knowledge" (Vartiainen and Kumpulainen, 2020). This validates that creative learning approaches motivate students to carry out practical work, providing them with evidence to 're-discover' ideas.*

*One way of incorporating science and playing together is by using play equipment. Science Play has been set up by scientists, teachers and outdoor play designers who have made bespoke playground equipment that is inspired by science. This type of equipment is both playful and educational: combining science and play together. Equipment like this is perfect for primary schools as it is multi-purpose and targets the age group who are most likely to engage in play at break times. The Foundation Phase sets out for children to build on their knowledge through exploring and investigating (Welsh Government, 2015). To do this, it's suggested that children should use a range of materials and equipment to build on their imagination and make connections between their own ideas and the ideas of others. Schoolyards are already social places and so to have a play piece of equipment there would only encourage more conversation and more exploration. It is argued by many that a child's curiosity to learn should be supported and stimulated by sensory experiences, both indoors and outdoors and expressed through movement, song, dance etc. (Johnson and Watts, 2018; Welsh Government, 2015). Through play, children can establish trust with their peers and remove their fear of being wrong which allows for creativity to flourish (Fan and Cai, 2022).*

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1 - <https://www.youtube.com/watch?v=exSLPMk2MSM>

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*Major issues like climate change and environmental protection are fundamental in the 21st century and so, it is important that all levels of education teach the impact of these issues (Reimers, 2021). Children can take on an experiential role and be encouraged to create ideas to help tackle environmental issues. A study on forest schools found that by having classrooms that are out in nature, children are best*

*encouraged to interact with their surroundings and experiment with the resources available (Knight, 2013). In forest schools, creativity is not only developed through art or craft activities. Allowing children to choose and experiment with different approaches to challenges and activities fosters an environment in which children are encouraged to think critically and creatively. As part of the curriculum for Wales, there is a keen interest in supporting learners to become enterprising, creative people but for them to also be ethical and informed on issues in Wales and around the world. It can be argued that if children are expected to develop the skills to become valued members of society, they must be able to take on active roles in a skills-based education. Forest schools thrive on experiential learning, and the way in which their learners identify problems, find solutions, and then analyze the impact of those solutions aligns accordingly with scientific methods. Therefore, more lessons could be taught outdoors as the skills learned through “doing” are invaluable and expected from today’s curriculum (Hemery, Hurst and Petrokofsky, 2019). The concept of experiential learning through play is encouraged by the Foundation Phase (Welsh Government, 2015).*

*With technology advancing at rapid speed, it is vital that children in schools are equipped with the tools and knowledge to be able to use these technologies during their education and for their future employment. Students engaged in STEM subjects (Science, Technology, Engineering and Mathematics) are encouraged by schools to partake in competitions such as First Lego League (LEGO Group & FIRST, [2013](#)). The competition consists of groups of children building robots and complete innovation projects, which gives children the opportunities to apply their STEM knowledge and use digital technologies to solve real-world problems (Meneske et al., 2017; Anwar et al, 2019; Brancalião et al., [2022](#)). Studies have found that art-based teaching methods can lead to more engagement in STEM subjects and that attainment increases when art-based practices are used (Henriksen, 2014). One of the four purposes of the National Curriculum for Wales is to ensure that education supports the development of enterprising, creative contributors (Welsh Government, 2022). To do this successfully, it is important that children are taught in a way in which they can engage with unpredictable scientific and technological change which will prepare them for life and work. The Foundation Phase places a huge emphasis on children having a sound understanding of the world, which is undoubtedly a key area that relates most to scientific inquiry.*

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**“Fewer play moments mean fewer opportunities to develop the skills children need to thrive in the dynamic, challenging economies of tomorrow”**

World Economic Forum (2019)

## Drama and Creativity



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*The theory of drama in education is based on the educational practice by the theorist Rousseau. "Learning in practice" and "learning in drama practice" are the two main points. Drama was thus introduced into schools and classrooms, enriching the existing teaching practice (Anderson and Dunn,*

2013). Creative drama can be role-play and make-believe, which are elements of play that target social growth and academic improvement. At its core, drama is a manifestation of imagination and creativity. Creativity in drama occurs during performance, planning and making processes. Drama can be used to teach subjects like English, Geography and history, and has “the potential to be a discipline itself” (Neelands, 2013). The activities that children engage in greatly influence their lives, from careers, health and sociological development (Cunha et al., 2010; Campbell et al., 2014; Luo et al., 2018)

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## Drama Education

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Research studies have shown that there are different qualities of drama that contribute to successful high-quality education (Schonmann, 2015). Teachers themselves should be able to take on a dramatic role by becoming creative teachers who are able to improvise and diverge away from lesson plans and finish the lesson in a different way, appropriately (Lehtonen, et al., 2016). A teacher’s creative approach can act as a model encouraging children to act creatively (Toivanen, Halkilahti and Ruismaki, 2013). Firstly, there is democratic creativity that frees teachers to focus their pedagogy on all students rather than just particularly talented pupils. This allows all children to be given the same opportunities. This is important because creativity in drama begins as soon as pupils begin to participate. Creating characters, researching their characters, and creating props or backdrops are all examples of creativity. Secondly, there is the idea of drama being collaborative as it relies heavily on the creative contribution of others and is dependent on teamwork. It can be argued that in collaboration, participants create zones of proximal development (Vygotsky, 1978). This is where a child is given appropriate assistance for a particular task which gives them the “boost” that they need to succeed at the task.

It is possible that drama can be incorporated in the teaching of all subjects. Teachers who do use drama as a teaching tool provide their students with the opportunities to practice and build on skills such as decision making, innovation, communication and team building. The better a child is at these skills, the more creative they can be (Water, McAvoy, and Hunt, 2015). In addition to this, it can encourage children to be more confident and curious which benefits their creative learning as they may ask more questions and do more research around a subject. This suggests that drama brings out children's creative engagement and enriches their imaginative development (Cremin and Macdonald, 2013). In an ever-changing world, it is vital that we teach children the importance of having imaginative approaches and coming with new ideas, as stated by the new Curriculum for Wales (Welsh Government, 2022) which aims to produce creative, entrepreneurial people.

There are numerous different ways to integrate drama with the curriculum. Playing games like hot seat, role-play and improvising scenarios are all ways in which children can practice the information that they have learned. This would work well for history lessons as the students could act out historical events and figures. Applying drama to lessons is successful in improving children's development. Studies have found that drama-enhanced lessons on languages have raised writing, reading and oral language development (Lehtonen, et al., 2016). Drama can extend pupils’ use of language and provide the sort of motivation

*and engagement that is necessary for language development to occur at a deep level (Fleming, 2017). Learning through drama gives children the opportunity to construct their own knowledge as dramatic play is related to mental activity (Piaget, 1971). Reenacting stories and role-playing are a way of reciting information in a creative, non-traditional way.*

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*Reports have found that most pupils in Welsh schools are able to collaborate effectively to improvise performances around a broad range of concepts and that most pupils can use their bodies and voices creatively to explore and communicate ideas effectively (Estyn, 2016). This is positive as it demonstrates that the school children of Wales are already thinking creatively and should be capable of becoming enterprising, creative contributors according to one of the four aims of the new curriculum for Wales, (Welsh Government, 2022). It may be likely that drama used in lessons has had an impact on these reports. This is because drama incorporates theatre to engage with students' social and emotional development as well as their learning. As drama is a multisensory mode of teaching, (Bolton, 1998; Toivanen, 2016) a range of teaching and learning techniques are used, hence using movement and vocal action which traditional classrooms have lacked in the past.*

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## Conclusion

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*In conclusion, there is a great emphasis on creativity within the new curriculum (Welsh Government, 2022). It is important that teachers and schools explore different practices of creativity to implement creative development in students for them to progress and become "enterprising and creative contributors". Whereas scientific play gives students the opportunity to experiment and solve problems, drama can encourage creative and critical thinking by acting out imaginary roles and scenarios. However, both of them challenge the children's perceptions of their world and themselves.*

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