

Creative approaches to education in the 21st Century

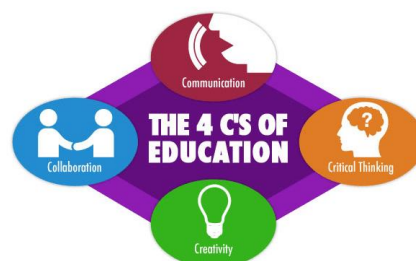
Declan Milton-Harris (1900817)

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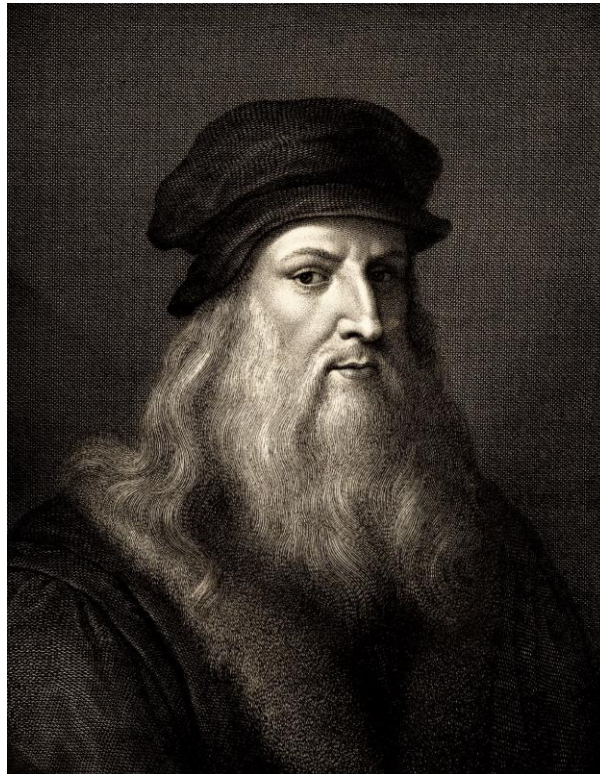
Introduction

Creativity within the 21st century continues to be defined with uncertainty, Patston *et al* (2021) define creativity as having ingenuity within ideas and high functionality in its cultural setting. Treffinger, Schnoover and Selby (2013) extend on this definition by stating the originality in creative thinking allows for innovative learners in education. Many creative theories have been derived over centuries, 'the creative genius' view believed a small variety of higher intellectuals were able to access their creative self as it was innate (Stone and Hess, 2020). This perspective is outdated and creates an impossible task for all teachers of the modern era to teach creativity. Therefore, 'creative play' within 'the creative classroom' perspectives of creativity are more relevant as they allow creativity to be readily accessible to every learner, creating links between knowledge and imagination for children in the foundation phase to explore (Clapp, 2016). Leonardo Da Vinci used art within his scientific inventions and science within his artistic creations, the unique link between art and science made all his work creative and can be used to develop creativity in classrooms today (Hickey and Robson, 2012). Using these approaches to creativity, learners can improve their creative abilities to facilitate other skills and competencies in education. The Welsh Government state the new curriculum will "enterprise, creative contributors" (Welsh Government, 2020), allowing students to be more innovative and think critically, linking creativity to enquiry in the learning environment.



The Leonardo Effect

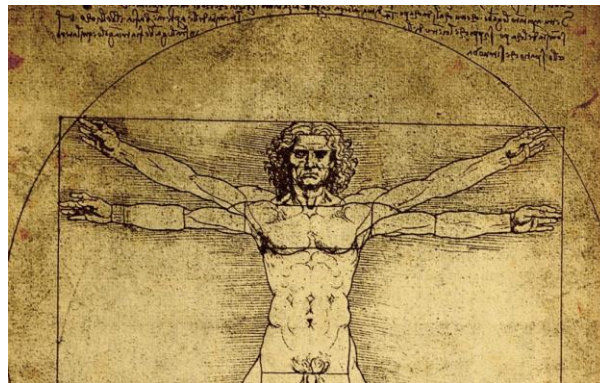
Leonardo Da Vinci conquered the 'Art versus Science' debate as he viewed the world through a curious and imaginative lens, this allowed the renaissance artist to design extremely accurate inventions, such as anatomical drawings, sculptures, and the parachute, which are still used in the 21st century (Pollman, 2017). This implemented the 'Leonardo effect' as a teaching approach, this takes the aesthetically pleasing experiences created from art and combines it with the practical experimentation in science, to develop an individual's creativeness (Veit and Ney, 2021). Furthermore, Metz (2016) believes the combination of art and science will benefit the student's problem solving, innovative and critical thinking skills to become more creative within the 21st century education.



2 - (Osborne, 2016)

Kennedy and Odell (2014) and Callander and Cummings (2020) state the importance of art has been neglected in recent years towards the development of creativity and entrepreneurship within schools. Emergence of STEM subjects is more applicable than ever with the recent economic crisis in the UK. Students who study science, technology, engineering, and mathematics are more likely to achieve better employment opportunities, an estimated 50% of individuals that qualify in STEM subjects proceed to be employed within "innovative firms and highly knowledge-based business services" (UK Commission for Employment and Skills, 2015). This reiterates that science-based learning is more effective to developing creative and entrepreneurial learners in comparison to art, decertifying the relationship the Leonardo effect has on improving creativity. Winstanley (2022) states Jean Piaget would disagree with implementing creativity as a learning method as his approach was structured stages of development. Learners need to complete certain activities to unlock their cognition. Much like using mathematics and engineering in STEM subjects, where one-dimensional thought processes are needed to acquire the correct solution to learn.

Liao (2016) and Aguilera and Ortiz-Revilla (2019) believe an integrated approach for Art and Science can be interchangeable to develop a learner's creativity and entrepreneurial mindset within education. The incorporation of art in STEM, creating STEAM, has been introduced into many schools globally. The purpose of this is to generate a more creative mindset for children by allowing them to experiment and prototype ideas to deduce the best solution for themselves. This allows learners to become confident in failure and use their innovation skills to apply new and diverse ideas to solve problems. Bevins (2012) develops this argument further by stating the need for creative thinkers in the accelerating technological age, learners can use their intuition and entrepreneurial skills to interpret technology in school. In addition, the Leonardo effect develops the creative thinking, resilience, and patience of learners in the primary and secondary phase, allowing them to be more employable in the future. Maria Montessori's approach to child development relates to the Leonardo effect as it enables children to explore real life situations and their personal interests with Kinaesthetic learning being key to development. Furthermore, the child leads the learning by their own curiosity and inquiry, reducing the educator to facilitate the learners needs when appropriate (Isaacs, 2018).



3 - (Green, 2018)

The Leonardo Effect has been implemented in a school in Wales, "Ynstawe Primary School" (Estyn, n.d.). The teaching approach has been split into three categories, the first stage allows for children to explore and experiment with their learning, the child directs their own learning around the subject at the second stage, finally the third stage challenges their knowledge using scientific and creative activities. A good example of this would be teaching during the world cup or Olympics, children can explore all the diverse cultures from the countries, choose one to explore further, then create a poster or collage representing their chosen country and show it to the class. This can be used as a universal teaching strategy for the whole primary school to follow. Skills can be developed through experimentation, particularly; creativity, independence, literacy, numeracy, and speech (Estyn, 2017). The Welsh Government (2015) direct their focus on creativity using approaches like the Leonardo effect, guiding children to be curious, innovative learners by experimenting new ideas. The use of music, drama, art, and other expressive subjects will develop children's confidence, imagination, and inquiry within their learning, subsequently improving their skills and competencies in other areas. Furthermore, using the Leonardo effect in the 21st century classroom broadens the view that science does not have to be rigid and unenthusiastic, the incorporation of art will excite learners to promote autonomy in the learning environment. Personally, the Leonardo effect has been included throughout my education journey. Visits to Techniquest allowed learners to explore in their own freedom, viewing how science and art create unique instruments, many examples such as water features with different pressures or visualising the mechanics of a lava lamp.



4 - (Carricker, 2019)

Creative Play

Fleer (2021) describes play as a tool to develop a child's imagination, giving them the opportunity to explore their environment through their own hands-on experience. Creative play can be categorised into a variety of contexts; physical, social, constructive, and imaginative, examples of this may include role play, sports, sandbox activities or whole class games. Play can develop a wide range of skills in the young learner, these can be but are not limited to; self-regulation, language acquisition, numeracy, and creativity, these link directly to the seven areas of learning in the Welsh curriculum (Welsh Government, 2015). Practitioners in the foundation phase can enhance creativity in children by creating active learning in the classroom and providing opportunities to play in new environments or with new equipment (Johnson *et al*, 2019).



5 - (Turner, 2015)

Bubikova-Moan, Hjetland and Wollscheid (2022) conducted a study to discover the views of primary school practitioners on teaching creativity through play. Similarly, to the Leonardo effect, educators believed play was most effective when the child initiated the learning but is further facilitated by the teacher. This can be seen through role playing or storytelling, where the teacher tells a story, and the children physically express the actions. Furthermore, Gajda, Karwowski and Beghetto (2017) researched the relationship between creativity and academic attainment, the study concluded that there was greater educational performance in more creative individuals. This reaffirms the value creativity holds on a child's learning in the 21st century education. Conn and Murphy (2022) discuss the importance free play has on developing a child's self-regulation and creativity. Indoor and outdoor play presents intense risk taking and decision-making opportunities in education, this is where learning is undertaken as failures can be repeated and corrected. John Dewey's philosophy of

learning relates to creative play as it indicates the importance for children to experience and experiment in their environment to encourage learning, raising similarities to the Leonardo effect where children should be more 'hands-on' (Casey and Quennerstedt, 2020). Moreover, Vygotsky's Scaffolding theory is relevant to creative play as the practitioner can assist learners to reach new levels of creativity and inquiry by scaffolding, this results in children having more confidence and innovation in their schooling journey (Puntambekar, 2022).

Chicken (2019) researched the beliefs of foundation phase educators about teaching creativity through play. One practitioner, 'Laura' stated that creativity requires risk taking behaviour by the children and emphasised concern about the risk to reward ratio. A child may become fearful of failure after failing to succeed many taken risks, this can impede their 'Big C' and 'Little C' creative mindsets and destroy their self-esteem. The importance to strengthen the child's 'Little C' creativity in education is vital for their future, to develop independence and solve daily challenges. Also, if risk taking opportunities are not controlled or available, society may miss young individual's 'Big C' creative ideas, such as a cure for cancer. Cheng *et al* (2022) evolve this argument by discussing the guidelines available to practitioners on developing creativity through 'unstructured outdoor play'. The line between a risk-taking opportunity and a health and safety hazard is blurry for teachers, learning may be impeded by the teacher's perceptive judgement. Alternatively, creativity is becoming more apparent in the 21st century education, but assessment via standardised test continues to rule how 'intelligent' a child is. The movement to more mentally flexible, innovative learners through creative play is more advanced to improve creativity, however it is useless when children are evaluated by exams and memory assessments as opposed to their entrepreneurial capabilities (Grigorenko, 2019). Burrhus Skinner's theory of operant conditioning would describe how a child learns to become afraid of taking risks in their environment. A child that continuously receives negative punishment, this could be hurting themselves when they fall, are less likely to try again and creativity is negatively affected consequently (Thompson-Bramwell and Mauzard, 2022).



6 - (Education Business, 2017)

Welsh Assembly Government (2008) state creative development of a child is most effective through new experiences, new materials and exploring through physically playing. This can be seen through gardens or through arts and crafts in the foundation phase, children can explore their environment and objects to create new understanding and ideas. In turn, visual, auditory, and kinaesthetic skills will be developed alongside the seven key areas of learning in Wales. Shirenewton Primary School in Wales uses play as a tool to improve children's inquiry in their education. Children have unlimited options to play indoors and outdoors, with the focus being child lead learning with the integration of organised activities by the practitioner (Estyn, 2019). As a result, children are competent working independently and socially, have strong imagination and decision-making skills with greater confidence when experimenting new ideas. Additionally, Cadoxton Community primary school uses play within life-like role playing situations and topic related research, for example, visiting the

doctor's office or pretending to cook. This will develop children's ability to relate their playful, creative mindset to real life experiences more effectively (Estyn, 2018). Having cousins aged 1 and 4, I have constant experience with creative play, playing with animal figures or shapes shows their powerful imagination and problem-solving skills. It is vital to develop creativity through play throughout all ages and areas of the 21st century education to strengthen the self-esteem of the learner and improve their soft skills.



7 - (Mama Bear Britt, 2018)

Conclusion

To summarise, both the 'Leonardo effect' and 'Creative play' are relevant creative approaches to evolve creativity and innovation in the 21st century classroom. Both approaches signify the importance of direct, experiential learning in education to enhance risk taking opportunities and therefore develop learner's decision-making skills (Liao, 2016 and Conn and Murphy, 2022). Although, the Leonardo effect is not actively seen in education in comparison to creative play, the Leonardo effect has more influence in education as it can be implemented into STEM and all aspects of education from the foundation phase to Higher Education (Aguilera and Ortiz-Revilla, 2019). However, when used together the possibilities for creative experiences are endless, creating a beneficial and purposeful learning environment for the learner in and outside of the classroom. The main aim of education in the 21st century is to "enterprise, creative contributors" (Welsh Government, 2022), integration of both the Leonardo effect and creative play in education will promote creativity further. Decision making, problem solving, critical thinking, innovation are skills that will be constantly challenged by pupils, which allows for entrepreneurial skills to become autonomous in the future. Furthermore, academic attainment may increase through creativity as learners will have more curiosity and inquiry towards learning, therefore improving their understanding of the topic they are studying.

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