Cultivating the skills and dispositions for young people to flourish in life: Learning from four key Waldorf education practices

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1 Context

The aim of Waldorf Education is to equip children with the knowledge, skills and capacities they will need to flourish in a complex and changing world. From early years to upper school, experiences and learning are sequenced to nurture children's potential to adapt, think creatively, be resilient, courageous, self-aware and have the insight to understand and empathise with others.
(Waldorf Education, 2025).

In March 2025 Waldorf UK commissioned the Centre for Real-World at the University of Winchester to undertake a small-scale study into some key aspects of Waldorf education:

- To help to improve visibility and credibility of Waldorf education with policymakers
- To highlight key aspects of Waldorf education that could be adopted by schools who are interested in a deeper learning approach
- To contribute to a wider debate about the kinds of skills and dispositions most likely to enable young people to thrive in a period of rapid change and how best these can be cultivated.

1.1 Waldorf education

The first Waldorf school opened in 1919 in Germany, inspired by the philosophy of Rudolf Steiner. Today there are more than 3,000 schools and kindergartens in 75 countries. Most Waldorf schools are independent, able to pursue curricula, pedagogies and assessment practices which align with their values. Schools are sometimes referred to as Waldorf, Steiner, Steiner-Waldorf or Waldorf-Steiner.

While there are many methods that are shared by most Waldorf educators, there is no one agreed approach in every school, though there are some overarching aims and key distinctive features (Biddulph et al., 2020; Rawson & Bransby, n.d.).

In essence, a Waldorf education has at its heart a focus on enabling children and young people to reach their potential, become well-rounded and responsible individuals, and actively participate in society. Its key objectives include promoting lifelong learning, social inclusion, cultural understanding, and sustainability, while also supporting pupils' health and well-being.

There are several things that make Waldorf distinctive, four of which are the pedagogies explored in this report. But perhaps most significant, is that, for Waldorf, education truly is about the whole person. Influenced by Pestalozzi, whose work showed that “there is more to [education] than prescribed learning outcomes; it is concerned with the whole person, with their physical, mental and psychological development” (Brühlmeier, 2010; p. 5), Waldorf also seeks to educate a child’s head, heart, and hands.

Much is written about the large-scale problems young people will face during their careers and how schooling must train their minds to find solutions, but to Pestalozzi, writing between 1780 and 1825, the problem was better solved by a thoroughly holistic education: “The continent has sunk so low morally, intellectually and socially, that it can only be

saved by educating people in humanity, that is by forming fully rounded human beings" (cited by Brühlmeier, 2010 p. 6).

To the question of 'what is the point of education?', some might answer: 'enabling students to take their place in society, the economy and the state'. But Brühlmeier, distilling Pestalozzi's view of education writes:

> 'But is that everything? ...can you live very well if you never read a book, never go to a concert or a museum, hang absolute kitsch on your walls, fritter away your free time aimlessly, cannot tell a pine tree from a beech, have forgotten everything you learnt in history lessons, never pick up a pencil to do a drawing and never think about the meaning of life either...'

Sure, you can fulfil your duties as a citizen and earn enough money, in a useful way, to live, argues Brühlmeier, but Pestalozzi's view was that there needs to be some kind of standard about what a 'quality education' leading to a 'quality life' looks like. Preparing children for life is insufficient. The school itself *is* real life, and it must be concerned with raising the child's capacities in speaking and language beyond purely functional but to aesthetic levels, and this is where the importance of music is seen. Waldorf places great emphasis on music and movement as integral to head, heart and hands learning (Biddulph et al., 2020).

Another notable distinction lies in the relationship between teacher and pupil, which reflects deeper philosophical convictions about the nature of childhood and learning. Waldorf pedagogy - particularly its emphasis on child-led play - is underpinned by a set of beliefs about human development and the purpose of education. Rudolf Steiner, like Rousseau before him, held that human beings are essentially born good or innocent and that it is society, rather than innate nature, that introduces distortion. Steiner believed that if a child is allowed to unfold their own potential through developmentally appropriate experiences, they will naturally come to act not selfishly, but in ways that serve the community (Rawson & Bransby, n.d.).

This idea draws heavily on Rousseau's influential educational philosophy. Unlike the Renaissance humanists who believed in cultivating human potential in virtue and reason through culture, a classical education and the liberal arts, Rousseau (active c. 1749-1778) proposed a more radical form of humanism. Believing that society corrupts, this suspicion of the underlying principles at the core of society led him to claim that "Everything is good as it comes from the hands of the Author of Nature, but everything degenerates in the hands of man". (Rousseau, 1899).

This anti-institutional stance set him apart from more traditional or classical views of education, which assume that the accumulated wisdom of culture - in religion, moral instruction, and literature - is valuable and worth transmitting. From a classical perspective, there is a paradox in Rousseau's view that naturally good humans have created distorted societies. Pestalozzi had a more nuanced view of human nature, more deeply shaped by his Christian faith, seeing that children are flawed but redeemable, with their flaws exacerbated by factors like bad education and poverty. Classical approaches

tend to view children as needing shaping through guidance, structure, and moral education.

Nevertheless, Rousseau's focus on child-centred, experiential, and developmentally attuned education laid a foundation for constructivist theories of learning in which learners actively build their knowledge through experience, often focusing on problem-solving and critical thinking to connect new information with their prior knowledge. Constructivism emphasises pupil-centred learning, with teachers acting as guides rather than more directly fostering understanding. Thinkers such as Pestalozzi and later Dewey (active c. 1890-1940) and Piaget (active c.1920-1970) built on this foundation. Piaget, for instance, credited Rousseau with articulating a "total conception" of the child as an active participant in their own learning, constructing knowledge through personal experience rather than passively absorbing it from adult authority (Piaget & Coltman, 1974; p. 139).

This view - that meaningful knowledge is actively constructed by the learner through engagement with the world - has become central to many progressive education models. In this respect, Waldorf's commitment to free play, experiential tasks, and interdisciplinary learning places it in the broad traditions of constructivism. The inclusion of open-ended, imaginative play within the rhythm of the school day reflects not merely a pedagogical preference but a philosophical stance: that education is fundamentally a process of personal exploration rather than the structured transmission of established cultural and intellectual heritage.

While Waldorf education has distinct characteristics, its foundations in the thought of Rousseau and others mean that it shares philosophical ground with aspects of mainstream education, certainly in initial teacher training through university-based post-graduate certificate of education (PGCE) routes, which are, in turn, often influenced by constructivist and social constructivist theories.

Many teachers today, regardless of their school's orientation, are familiar with these influences and may recognise elements of constructivist learning - particularly in the works of Dewey and Piaget - in their training. Of course, tensions exist: despite this theoretical grounding in schools of education, the English National Curriculum (Department for Education, 2013; Department for Education, 2014) leans more towards knowledge based education and cultural literacy, though many practitioners will assume constructivist principles to be valid, and make pedagogical decision on how much weight to give knowledge versus experience in the classroom.

A point of difference between mainstream and Waldorf, however, is that while many mainstream teachers might talk of the importance of the individual child and his or her relation role in the learning process, Waldorf's approach to child development is a more particular one centred upon the idea of the role of the teacher as having "a sacred task in helping each child's soul and spirit incarnate in the world", (Woods et al., 2005; p. 84). In Waldorf schools, the teacher-pupil relationship is a particularly enduring one, with teachers often staying with their pupils throughout their school experience where possible. Teachers also select activities for reasons not of future utility but "for their value in developing the child's soul qualities"(ibid.).

1.2 Our approach to the review

This is a rapid scan of evidence using a limited range of search terms to locate high-quality studies (systematic reviews where these existed, meta-analyses and detailed literature reviews) as well as grey literature from authoritative sources.

There are many aspects of Waldorf education but for the purpose of this work the focus has been on four distinctive pedagogies identified by Waldorf UK:

> **Experiential learning:** Exploring both direct experience (practical and 'real world' learning) and imaginative experiences, including Waldorf 'storytelling' approaches.
>
> **Interdisciplinary learning:** Thematic, cross curricular learning in 'blocks', where a topic is explored from different perspectives.
>
> **Play as a key approach in early childhood:** Understanding how children develop social, emotional, cognitive, and physical skills through active engagement in play, while fostering positive learning dispositions alongside the development of content knowledge.
>
> **Creative Education:** Looking at how creativity is woven through the curriculum/ teaching day in all subjects, including singing and music, movement, and craft, with an emphasis on the history and nature of the 'head, heart, and hands' approach.

The review was undertaken by a research team with more than two decades of experience of studying these areas. In addition, the research team drew on their extensive knowledge of international and national educational policies and practices to offer some general commentary about the relationship of the specific area of focus to national and global contexts. The review highlights evidence of impact relating to key elements of the Waldorf approach and builds on earlier suggestions in a review of the Steiner Waldorf Curriculum (Pountney, 2019).

In thinking about the wider implications of Waldorf practices, three questions have guided the research:

1. Are there pedagogical approaches from Waldorf education that could or should be adopted in some form by other educational settings and why?
2. From the identified approaches, what skills and dispositions are cultivated?
3. Is there evidence that these approaches will help young people to flourish at and beyond school?

It is hoped that schools interested in promoting deeper learning will find points of interest and that the whole report will contribute to the broader debate about the aims of schooling today, specifically drawing attention to the kinds of skills and dispositions which are likely to help students thrive.

To see Waldorf education in action, the research team visited the Steiner Academy in Hereford, the only state Waldorf school in England. Findings from the literature review were shared with and critiqued by a small number of Waldorf experts.

This brief study was undertaken between March and the end of July 2025.

2 Experiential learning

We do not learn from experience…we learn from reflecting on experience.
(Dewey, 1933, p. 78)

2.1 What is experiential learning?

Experiential learning is one of a number of approaches to teaching and learning from a broadly constructivist approach often referred to by the "umbrella term" of 'active learning' (Ting et al., 2023; p. 380). Other active learning, learner-centred approaches include "collaborative learning, experiential learning, discovery-based, group-inquiry-based, problem-based and activity-based" (ibid.). These approaches focus on engaging learners "in their own learning process through their active involvement in class" (Ting et al., 2023; p. 381) in contrast with pedagogies that involve passive learning, or instructor-centred, lecture-based, "traditional" approaches (ibid.).

Johann Heinrich Pestalozzi was an early proponent of experiential or active learning. In *How Gertrude Teaches Her Children* (Pestalozzi et al., 1898) Pestalozzi presents the mother as the ideal educator; educating her children not through formal lessons, but through care, practical activity and moral example. For Pestalozzi, learning begins with concrete experiences in the home, where intellectual, emotional, and physical development (head, heart, and hands) are naturally integrated. For him, foundations in the home were critical to developing a good society: "the whole success of the education of the people depends on the good state of the family circle" (Pestalozzi, 1818; p. 6). Though framed around the importance of maternal education, the book is also an argument for experiential learning. Knowledge, in Pestalozzi's view, must be built through guided activity and reflection, not imposed through abstract instruction.

His work laid a foundation for later constructivist thinking, and his emphasis on holistic development resonates closely with Waldorf's understanding of education as a moral and developmental journey.

Experiential learning engages learners in hands-on, real-world activities intended to integrate conceptual, procedural, and factual knowledge "within the setting of the discipline" (Burch et al., 2019; p. 244), and is rooted in the idea that knowledge is created through transformation of experience (Kolb, 1984). Although not a feature of David Kolb's work conceptualising experiential learning; the relevance of disciplinary context as the setting for learning is understood by contemporary scholars (Morris, 2020; p. 1071). Morris (2020, see Fig. 1) shows how contextually rich concrete experiences are an essential part of the learning cycle.

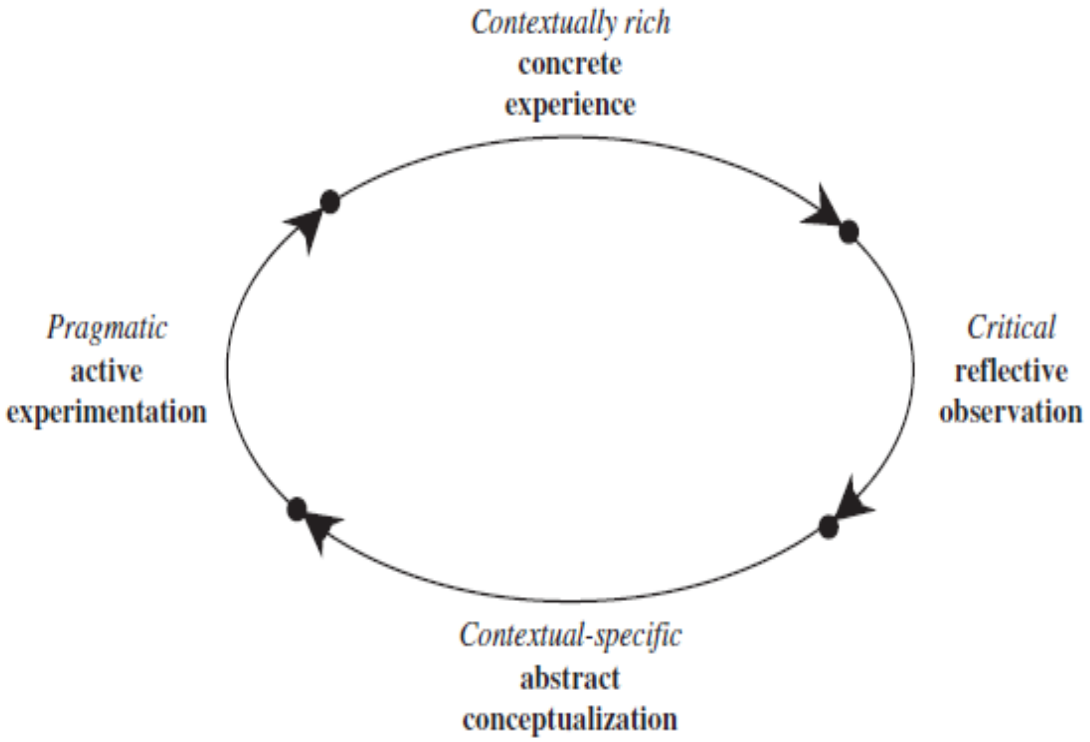

Figure 1 – The experiential learning cycle: Morris (2020) revision of Kolb's (1984) model

The cycle sees these four elements shown in Fig. 1 as essential to the process of learning. Active participation in the learning process might involve collaboration, problem-solving and inquiry-based activities that demand engagement and interaction. Critical reflection is a central component, allowing learners to analyse their experiences, connect them to theoretical concepts, and derive meaningful insights.

Examples of experiential learning include:

- Gardening or nature-based activities where children grow plants, observe ecosystems, and engage with seasonal rhythms firsthand.
- Handcraft projects such as knitting, woodworking, or pottery that involve making something with tangible materials over time.
- Role-play or drama-based learning, where students inhabit historical or literary characters to explore empathy and perspective.
- Outdoor expeditions or fieldwork, like orienteering, geology walks, or ecological surveys that combine physical challenge with direct observation.
- Scientific inquiry projects, where learners pose questions, design experiments, and test hypotheses with real-world materials.
- Building or design challenges, such as creating models, shelters, or prototypes using a mix of creative, mathematical, and spatial skills.

2.2 What evidence is there of how experiential learning benefits pupils?

Experiential learning has been found to positively influence pupils at school and beyond in several ways, from improved learning outcomes, improved outcomes related to physical activity, more complete conceptions of knowledge, development of important learning habits, and improved behaviour, empathy, and well-being.

In terms of the latter, Chan et al.'s (2021) systematic review and meta-analysis screened 1096 randomised controlled trials of adolescent learning programmes, yielding 20 includable studies. They found effective experiential learning programmes positively influenced adolescent development and curbed risky behaviours including substance abuse, violence, addiction, antisocial behaviours, internet and gaming addiction, and risky sexual behaviour. The experiential learning programmes were more effective at improving these three variables than non-experiential learning programmes that aimed to do the same thing. The most effective programmes at achieving the outcomes of increased empathy, prosocial behaviour and subjective well-being were those that used service-learning events, community service projects, simulation, role-play or adventure programmes to apply new concepts and skills" (p. 14).

A systematic review of the effects of experiential learning interventions on 'physical activity outcomes' in children (Varman et al., 2023) reviewed 12 eligible studies. It found that the interventions enhanced behavioural, knowledge, and attitudinal outcomes. For example, interventions improved physical activity behaviour - meaning increased frequency, intensity, and engagement in activities like moderate-to-vigorous physical activity. They improved physical activity knowledge - meaning better understanding of the benefits of physical activity and healthy lifestyles. They further improved attitudes - meaning increased self-efficacy, motivation, and positive perceptions of physical activity. Effects were brought about by combining enjoyable practical activities (fitness activities, games and challenges) with behaviour change techniques (goal setting, and self monitoring), underpinned by behaviour change theory over a short but intense period of time (e.g. several sessions each week for less than 4 months).

The integration of knowledge in real-world activities "has the potential to allow students to develop more complete understandings or conceptions that will lead to more advanced learning." (Burch et al., 2019; p. 244).

There is evidence that experiential learning can lead to improved learning outcomes. Of over 13,000 papers referring to experiential learning across 43 years, 89 suitable for meta-analysis were compared by Burch et al. (2019; p. 239), and collectively showed that "students experienced superior learning outcomes when experiential pedagogies were employed". 44 studies were likewise analysed by Ting et al. (2023; p. 387), with results similarly indicating that "active learning interventions had a higher effect on student performance than the traditional lecture-based format".

A rapid evidence assessment (Ranken et al., 2023) analysed the findings of 44 peer-reviewed studies published during the last decade after screening 465 studies for relevance and methodological quality. The most significant benefits were seen in science and maths, while language and literacy outcomes were mixed. The authors found

experiential learning to be particularly beneficial to low-achieving pupils, in terms of learning gains compared with their peers.

A systematic literature review (Abuhassna et al., 2024) looked at evidence for various instructional design methods, including experiential learning. Without specifically looking to review evidence for its outcomes, they noted another study (Radović et al., 2022) that found experiential learning effective "in boosting academic success and engaging students in re-contextualisation and reflection processes" arguing that it is "instrumental in enhancing learning outcomes" (2024; p. 9).

The findings of Radović et al. are supported by empirical evidence from three iterative design-based research studies. Experiential learning here was facilitated using the 'mARC' (more Authenticity, Reflection, and Collaboration) instructional design model that uses these three 'pillars' of experiential learning. These studies compared more- and less 'authentic' course designs, and then took the more authentic environment and compared course designs with more- and less explicit reflection features. Researchers found statistically significant improvements in academic performance for students in the 'more reflection' condition. Although there were no significant differences in academic performance, the cumulative approach suggests that reflection and collaboration elements positively impact learning outcomes.

The studies also revealed that students achieved higher levels of reflection in the 'more reflection' condition, and significant improvements in the quality of reflection due to collaborative reflection. Students in the 'more authentic' environment had significantly higher perceptions of authenticity, and perceived their learning environment as more experiential. Across all three studies, students' motivation remained high, indicating that more complex learning instructions did not lead to a decrease in motivation. Overall, the findings suggest that the mARC model provides a useful framework for designing experiential learning environments that enhance academic performance, reflection, and perceptions of authenticity.

Ranken et al's review (2023) found experiential learning to have positive effects on general skills in problem-solving, critical thinking, memory, and vocabulary development. Notably, these skills may provide foundations for children's broader learning across curriculum subjects and the sorts of learning that experiential learning helps children discover may well not be taught in discrete subjects.

In terms of most conventional academic outcomes, however, the evidence is less well-developed. The Education Endowment Foundation (EEF) (n.d.-a) finds the current evidence base for outdoor adventure to be very weak. Recognising it may well have positive impacts on other outcomes such as "self-efficacy, motivation and teamwork" and play a role in the wider school experience, outdoor adventure learning is judged to have "[u]nclear impact for moderate cost based on insufficient evidence".

While the EEF review looked at outcomes and not mechanisms of *how* experiential learning improves the three sorts of outcome, the authors reviewed literature that suggested this may be due to "opportunities and resources to develop their strengths and form meaningful social networks" (p. 2). Programmes that follow experiential learning

principles (i.e. the learning cycle with its four elements) benefit from being "explicitly structured to aid the transformation of experience into new ways of thinking and behaviours" which is "likely a decisive factor for programme effectiveness" as pupils were able to "assimilate and comprehend new knowledge" (p. 12). Programmes studied that did not follow Kolb's framework ('non experiential learning) nevertheless benefitted from other "well-established theories such as Social-Emotional Learning and Cognitive-Behavioural Theory". The authors noticed that a major difference between experiential and non-experiential learning programmes was the amount of facilitation of reflection. Results of this review provide support for broader application of experiential learning.

Key learning habits and skills potentially developed through experiential learning include:

- Empathy
- Prosocial behaviour
- Physical activity
- Vocabulary development.
- Enhanced knowledge assimilation,
- Complex understanding
- Reflective learning
- Problem-solving
- Critical thinking.

2.3 What evidence is there of any limitations of experiential learning?

Experiential learning, when done well, develops a number of skills and dispositions which will help young people to flourish in life. But it requires considerable teacher expertise, ensuring careful design with clear objectives, appropriate duration, and opportunities for feedback. Particular responsibility for ensuring feedback is adequate to deliver the intended benefits falls on the teacher (Burch et al., 2019; p. 245; Morris, 2020; p. 245).

It also requires well-qualified and experienced teachers, with "knowledge about the latest skills, devices, innovations, and skills for practicum/practical tasks and field visits" (Rani & Tyagi, 2022; p. 380). Rigorous training becomes imperative (Morris, 2020; p. 1073) if teachers are to be able to assess – particularly if they are used solely to "paper-pencil test" style assessment (Rani & Tyagi, 2022; p. 380) – and to provide meaningful guidance and post-activity review that is "crucial to transferring experience to knowledge" (Burch et al., 2019; p. 246).

Experiential learning can be less applicable when pupils have no previous experience of a subject, because concrete experience is required from which sequences of activities can then take place to complete the learning cycle (Nhlumayo & Eze, 2024).

Although writing about a rural Indian context, Rani and Tyagi's (2022) observation that lack of resources and facilities, such as laboratories, equipment, and space, can inhibit teachers' ability to facilitate experiential learning, can be an issue.

Ranken et al's (2023) rapid evidence assessment noted several studies where teachers perceived tension between experiential learning approaches and the formal curriculum's expectations. Part of the issue here was teachers' mindsets: when they saw experiential

learning as being a useful tool for delivering aspects of the curriculum, it became just that; facilitating useful and meaningful learning experiences. Rani and Tyagi (2022) note that teachers may also face difficulty fitting experiential learning into curricula that is heavily theoretical.

Child-centred approaches are often rooted in the sort of secular humanistic philosophy that emphasises autonomy, experiential learning, and the absence of moral absolutes. Lau (2018) argues that the relativist and self-directed nature of child-centred approaches are incompatible with many religious-affiliated schools because of the philosophical divergence between the two sets of beliefs.

Where child-centred approaches are practised, there are significant decisions to be taken about the mix of experiential and didactic approaches to learning. In their comparison of conservative and progressive approaches to knowledge, Young and Muller argue that not all learning can, or should be experiential, or we risk "uncritical celebration of experiential forms of knowing" (Young & Muller, 2010; p. 19).

2.4 How does experiential learning sit within the current education climate?

At the outset it is worth acknowledging the considerable overlap between experiential and interdisciplinary approaches in that, for example, both favour project-based approaches to teaching and learning. Comments made in section 3.3 may equally apply to 3.4 and vice versa.

While the predominant model of curriculum organisation internationally assumes that formal teacher instruction will be the dominant mode, a number of countries have begun explicitly to include a focus on the importance of experiential learning. India, for a long while a country with an almost exclusive emphasis on knowledge, has a new curriculum explicitly focusing on experiential learning (Bhardwaj et al., 2024). Other global examples include the International Baccalaureate Diploma Programme (Hayden & McIntosh, 2018), various state-or district-wide programmes such as Rethink Secondary Learning in Ontario Canada (Thames Valley District School Board, 2017) and Hands-On Learning in Victoria, Australia (Hands On Leanring, n.d.).

In some countries and states across the world there has been a reaction to more progressive approaches to education and a growing focus on what has become known as the 'knowledge-rich' curriculum.

Nevertheless in a recent overview the Organisation for Economic Co-operation and Development (OECD) suggests that "many education systems around the world have initiated curriculum reforms, transitioning for instance from a knowledge-based to a competency-based curriculum" (Gouëdard et al., 2020; p. 9).

Since 2012 the Department for Education England has very much been advocating a knowledge-rich approach to the curriculum, a commitment to which has been confirmed in the recent interim report of the Curriculum and Assessment Review (Department for Education, 2025; p. 25). In the Early Years Foundation Stage Framework (Department for Education, 2024) while the phrase 'experiential education' is, perhaps surprisingly not

used, there are many opportunities to draw on children's experiences. As pupils progress through the five Key Stages of statutory education, experiential learning is increasingly absent from the formal curriculum, in most schools existing solely in areas such as project work and extra-curricular activities.

Nevertheless there are institutions such as School 21, which prioritise 'real-world' learning such that pupils "are never asked to complete an inauthentic task" (p. 6) encourages teachers to view their own practice as continuous professional development (CPD), such that up to 70% of their CPD is then on-the-job experiential learning (The Edge Foundation, 2019).

2.5 What is Waldorf's distinctive approach to experiential learning?

In Waldorf schools there are typically three kinds of experience; direct experience (hands-on gardening, for example), imaginative recollecting of experience (as in a story) and mediated (through, for example, a painting depicting an experience). The Waldorf approach sees human development taking part over three seven-year phases, with characteristic "physical, emotional and intellectual dimensions" (Biddulph et al., 2020; p. 31). The role of physical experience is present in a Waldorf education in its 'head, heart, hands' approach to learning, in particular through eurythmy, defined as "music and speech expressed in bodily movement" (De Souza, 2012; p. 54) and through the kinds of activities listed in 2.1.

Steiner's spiritual approach - 'anthroposophy' - sees the body as a "threefold being of body, soul, and spirit", with body a "threefold organism of head (brain/nervous system), trunk (rhythmic heart and lung system), and limbs. The soul relates to the faculties of thinking, feeling and willing; the spirit to imagination, inspiration and intuition." (Biddulph et al., 2020; p. 33). As a holistic system of education, Waldorf aims to develop each of these aspects in a well-rounded experiential exploration of topics.

In Waldorf schools, there is a strong emphasis on 'handcraft' where 'head, heart, hands' principles can be applied, and learning is physical. Physical crafting skills include "growing things, woodwork, forging, knitting" (Biddulph et al., 2020; p. .9) and more, often with an emphasis on sustainable living.

3 Interdisciplinary learning

School systems should base their curriculum not on the idea of separate subjects, but on the much more fertile idea of disciplines…which makes possible a fluid and dynamic curriculum that is interdisciplinary.
(Robinson & Aronica, 2009, p.160)

3.1 What is interdisciplinary learning?

Interdisciplinary learning emphasises integration of knowledge across different disciplines to foster a holistic understanding and problem-solving approach. As an educational approach, it aims to help learners be more confident to take on challenges beyond school and maximise the benefits of their education by helping them make connections (Peterson & Stockdale, 2022). While the fact that interdisciplinary learning and disciplinary learning "strengthen one another" is "well established" in the academic literature (Ecctis, 2021; p. 67), there is "something approaching consensus" in the literature that interdisciplinarity must build upon a strong disciplinary foundation (p. 66).

Interdisciplinarity and curriculum integration are terms that are often used interchangeably (Tonnetti & and Lentillon-Kaestner, 2023). There are also other distinct practices associated with interdisciplinarity. These include cross-disciplinarity, multidisciplinarity, and transdisciplinarity (Tonnetti & and Lentillon-Kaestner, 2023; Weller & Appleby, 2021). Essentially, interdisciplinarity can be defined as "when students are encouraged to *integrate* and compare the approaches, insights and methods between two or more disciplines as part of the curriculum" (Weller & Appleby, 2021; p. 1).

Interdisciplinarity's philosophical underpinnings are rooted in constructivism; that learners construct their own understanding and knowledge of the world through experiences and reflecting on those experiences. Interdisciplinary learning is, by nature, aimed at solving problems, which makes it practical in nature. Three broad strategies or practices within this paradigm emphasising the practical aspects of learning are project-based, problem-based, and inquiry-based learning.

Project-based learning is a form of inquiry-based instruction (Tawfik et al., 2020) that originated in Medical Education (Walker & Leary, 2009). It often coincides with discussions of interdisciplinary learning in the literature. Broader interdisciplinary learning and project-based learning differ in their implementation and focus in that project-based learning is learning specifically through projects that focus on problems in their real-life settings (Merritt et al., 2017; Walker & Leary, 2023). Walker and Leary (2023; p. 1) argue that 50 years since Barrows first cautioned against the possibility of defining a single description, the complexity of project-based learning approaches still makes research into its effectiveness complex. They also identify "several related problem-centred pedagogies, such as case-based learning, project-based learning, and inquiry-based learning, among others". Tawfik et al. (2020; p. 1) categorise project-based learning as one of "many variations of inquiry-based instruction" (elsewhere; one of the most "prominent forms" of inquiry-based instruction (; p. 3)), which also includes methods such as "lecture prior to problem solving, and case-based learning", which include "different levels of student-

centredness and instructor support". Inquiry-based learning is based largely on situated learning theory, with real cases serving as testbeds for the practise of problem-solving.

Practical learning, as defined by Hanson and Lucas (2022; p. 4) is

> *Learning that is whole, involving head, heart and hands and working in harmony, when teachers use carefully chosen strategies that encourage learners to*
>
> - *experience and navigate real-world challenges*
> - *acquire and apply their knowledge in a range of settings*
> - *explicitly develop skills and dispositions for lifelong learning*.

The authors include project-based learning, problem-based learning, and inquiry-based learning in their definition. Under this definition, learning that happens through practical means takes place for the explicit purposes of imparting some (broadly) pre-defined knowledge, and inculcating some (defined) skills and dispositions.

Barrows claims project-based learning's arrival into education settings several decades prior was "a reaction to the problems and shortcomings of conventional educational approaches". These are not named, though the positive aims of project-based learning the author lists suggest they might have been described as: a lack of effective learner skills in problem-solving; a lack of self-directed learning as a habit; a lack to team working, and a lack of integration of a body of knowledge crossing disciplinary boundaries (Barrows, 2002; p. 119). Barrows, who first developed a taxonomy for classifying variations of project-based learning in 1986 "in order to help teachers choose a problem-based learning method most appropriate for their students" (p. 481) identifies project-based learning's key components as being

- ill-structured but authentic problems,
- learners taking responsibility for determining gaps in their knowledge and understanding (they must "identify the germane concepts of the problem space [and] also identify their relationships" (Tawfik et al., 2020; p. 3)), and
- teachers as facilitators posing meta-cognitive questions.

Walker and Leary (2009) note that other authors add the small group setting as a characteristic of project-based learning. Examples of interdisciplinary learning could include:

- Ancient civilisations project combining history (e.g. Ancient Egypt or Greece), maths (pyramids or geometry), art (frescoes, pottery), and storytelling or drama (myths and legends).
- Medieval life unit blending history (feudal systems), art (illuminated manuscripts), literature (epic poetry), and music (early instruments and chants).
- Farm-to-table project integrating biology (plant growth), maths (measuring and budgeting), cooking (practical skills), and citizenship (food miles and ethics).
- Space exploration topic drawing on physics (gravity, propulsion), art (space-themed creations), literacy (science fiction writing), and ICT (coding or simulations).

- Inventors and inventions unit blending science (simple machines, electricity), design technology (building prototypes), history (Industrial Revolution or key inventors), and persuasive writing (pitching inventions).
- Cultural festival week that includes geography (countries and landscapes), RE (beliefs and rituals), music and dance (cultural traditions), and languages (basic phrases and greetings).

3.2 What evidence is there of how interdisciplinary learning benefits pupils?

Observed benefits of interdisciplinarity in the 40 studies compared in a meta-analysis (Tonnetti & and Lentillon-Kaestner, 2023) include motivation, achievement, and personal skills. Motivation seems to arise when perhaps a course is "in line with students' interests and needs" and enables a level of choice. Initial interest in one discipline can, through interdisciplinary study, spread to the second. Pupils seem enjoy learning in this context; it gives meaning to learning and contextualises academic knowledge (Tonnetti & and Lentillon-Kaestner, 2023).

Achievement seems to benefit at three levels. Firstly, it helps pupils better understand academic content. Secondly, it may give "a more holistic understanding of learning", according to teachers and pupils (p. 9) by creating links between disciplines, helping learners recognise the logic within each discipline and facilitating transfer of knowledge between discipline boundaries. Thirdly, it appears to have a positive impact on achievement as ranked by summative assessment.

Personal skills and relational skills seem to be promoted also. The authors detail these outcomes in the same discussion as 'achievement'; perhaps because of the close overlap between creativity, critical thinking, empathy, self-confidence and the ability to collaborate, with achievement. Interdisciplinary learning is said to lead to personal skill development because of the way learners become active participants in their learning, and because of the way that interdisciplinary approaches "aim to train autonomous, empathetic, responsible, respectful, and creative students and help develop students' self-confidence and critical thinking" (p. 10). Relational skills are developed through the interdisciplinary process itself, that "stimulat[es] collaboration, and group work" (ibid.).

Cai and Sankaran (2015) found evidence through one study of a specific interdisciplinary 'study abroad' programme that it developed "analytic and critical thinking skills" (p. 47).

The International Baccalaureate Organisation (Ecctis, 2021; p. 6) reports that interdisciplinary learning "has widely been shown to have beneficial outcomes"; namely the development of skills needed for further study and work.

A recent systematic literature review (Abuhassa et al., 2024) makes claims about the outcomes of implementing various instructional design models without qualifying specific evidence. Since it is not the authors' intention to evaluate the efficacy of these approaches but rather to examine their underlying principles and intentions, we treat claims regarding the instructional design approach of interdisciplinary learning and project-based learning as being intended to reflect its goals rather than empirically proven outcomes, unless

stated – at least based on the evidence presented in this review. They also state as a limitation the challenges in evaluating and comparing approaches "due to the dynamic nature of education" (p. 10).

Practical learning, often requiring contributions from many different disciplines, when done well, can be "at best equal to but no better than traditional methods" for learning subject-specific knowledge (Lucas & Hanson, 2021; p. 21). Lucas and Hanson's review found contradictory studies. In specific subjects - science, technology, and social studies - and also in cross curricular learning, researchers noted positive impacts on content learning. One study suggested that gains might be higher in social sciences than in STEM subjects, and other studies have shown that inquiry-based learning is associated with lower science scores, with teacher-directed instruction correlating "more positively with students' higher PISA test scores in science" (p. 22). Their review found limited evidence of practical learning's impact upon maths and literacy. The EPQ (Extended Project Qualification) is an exception; it's been found to enhance performance in certain A-levels, taken concurrently (Gill, 2022).

Studies on practical learning's implementation in secondary schools remain rare. A systematic review (Tonnetti & and Lentillon-Kaestner, 2023; p. 1) found that "few interdisciplinary practices are used in secondary schools" and "even fewer achieve a real integration of disciplines". Part of the reason for this is that secondary schools have "strong disciplinary identity among specialist teachers" review (p. 12).

Regarding evidence for the efficacy of project-based learning outside of medical education, Tawfik et al. note that few studies have been completed (2020), and further clarity is needed to determine which, of the inquiry-based instruction methods the authors studied, "best supports learning outcomes such as conceptual knowledge, causal reasoning, and self-efficacy" (p. 1).

Pinto and Zvacek (2002, reviewed in Abuhassna et al., 2024; p. 23) found some evidence from engineering students that a T-shaped design "impacted their learning, encouraging teamwork and discussion of outcomes while mastering complicated engineering software". The authors define T-shaped learners as having

> *…deep knowledge of their discipline (the vertical stem) as well as transdisciplinary skills that facilitate teamwork, communication, lifelong learning, and problem-solving (horizontal stem), for example. They are often referred to as "soft skills," but this label does not mean they are fluff; these are some of the more difficult requirements for professional success. (Pinto & Zvacek, 2022; p. 53)*

Abuhassna et al. (2024) propose exploration of diverse subject matter could help foster "well-rounded learning experiences" (p. 11). Ravitz argues that "there is a hypothesis that knowledge and skills learning is enhanced by being grounded in an application-level problem, offering better teachable moments and opportunities to learn" (Ravitz, 2009; p. 7).

Project-based learning aims to develop problem-solving skills (Barrows, 2002; p. 119). Barrows contends that "the skills and activities required of the learners are those valued in

the real world" (p. 120), which is arguably useful for learners as they deal with learning both inside and out of school.

Project-based learning aims to develop self-directed learning (Barrows, 2002; p. 119; Tawfik et al., 2020), and it is integral to its method – though this by no means guarantees transfer of the habit – that tutors "prompt students with meta-cognitive questions and provide direction without directly telling the student what to look for and where to go for information (Leary et al., 2013). In one study of the effectiveness of project-based learning that Strobel and van Barneveld (2009) reviewed, medical students taught by project-based learning saw themselves as "disadvantaged relative to their traditional learning counterparts" but viewed themselves as better prepared in "self-directed learning skills, problem-solving, information gathering, and self-evaluation techniques" (p. 49).

Various authors have suggested that project-based learning may lead to "increased student connectedness, engagement, motivation, or prolearning attitudes" (Ravitz, 2009; p. 8) though it is important to note that 'engagement' does not necessarily equate to meaningful or effective learning outcomes, the acquisition of substantial knowledge or development of critical skills. On the other hand, the possibility that it "may also promote student engagement in authentic intellectual work" (*ibid.*) is claimed by various researchers "can lead to better academic outcomes" (*ibid.*).

Teachers who use project-based learning play a vital role in its possible success by exhibiting certain behaviours. Ultimately, their role is to guide students

> *…through metacognitive questioning to stimulate their problem solving, identification of what needs to be learned and from what resources, their critique of their study and resources, the application of new learning back to their problem work, their summarization of what has been learned and their self and peer evaluation.* (Barrows, 2002; p. 120).

Without making claims for project-based learning's effectiveness, the tutor functions and characteristics highlighted by various authors in the literature (Leary et al., 2013) are to:

- raise awareness in higher cognitive thinking and question development
- facilitate the collaborative construction of knowledge by students
- progressively turn the role of facilitator over to their students
- model desired behaviour
- monitor discussions
- focus student efforts on deep and critical thinking
- be an expert learner who can model their own learning strategies by asking metacognitive questions and focusing on the process of learning
- ask guiding and clarifying questions
- facilitate discussion and thinking
- support and facilitate students throughout the process.

As with play, in the following section, there is an argument that the best learning is fostered by multiple approaches (Ravitz, 2009; p. 7).

Literature on interdisciplinary learning tends to describe its benefits in terms of broadened perspective and holistic understanding on the one hand, and a broad set of thinking skills, such as critical thinking and creativity on the other. These outcomes are said to arise as pupils integrate knowledge across disciplines in order to address complex real-world problems effectively. Additionally, it is described as being beneficial for motivation and engagement by connecting academic learning to pupils' interests and real-life contexts (Weller & Appleby, 2021).

Lucas and Hanson's review of practical education in secondary schools (Lucas & Hanson, 2021) notes that existing research has not yet fully explored the potential benefits of practical learning pedagogies. As a result, there is a lack of high-quality meta-reviews on the topic (2021; p. 26). This means we have limited evidence on how practical learning approaches, such as interdisciplinary learning, can help develop the essential skills and habits needed for success in life.

Their review draws on a range of individual studies, each of which point to possible outcomes, with varying degrees of certainty. For example, one source suggests "it can enhance creativity" (2021; p. 53); one finds inquiry-based projects to be associated with gains in students' learning of science ideas (2021; p. 24) (while another study contradicted the existence of such gains); two suggested that it can enhance critical thinking and problem-solving (2021; p. 53); and four that interdisciplinary subjects could develop mastery of "skills and attitudes such as problem-solving and collaboration that support innovation in the workplace" (2021; p. 59).

The authors identify a "limited" amount of evidence for the effectiveness of PBL on maths and "no clear impact" on literacy from one study (2021; p. 23) . Its impact on students undertaking the Extended Project Qualification (EPQ) in England is said to be "positive" " (2021; p. 24).

Lucas and Hanson also make the argument that collaborative work in groups on ill-structured problems can enhance problem-solving, citing two other works. They find mixed evidence about its ability to enhance communication, evidence for its positive effects on engagement, particularly in the "harder" sciences (p. 28), and on motivation and confidence.

Key learning habits and skills potentially developed using interdisciplinary learning include:

- motivation
- holistic understanding
- broader perspective
- relational skills
- teamwork
- enhanced learning
- problem-solving
- self-directed learning
- engagement in authentic work
- prompts learners to ask good questions.

3.3 What evidence is there of any limitations to interdisciplinary learning?

While it is well established that "disciplinary learning and interdisciplinary learning can strengthen one another" (Ecctis, 2021, p. 67) and that "knowledge and understanding gained in one discipline can be activated by prompts in another" (Ecctis, 2021p. 67), ensuring the best balance requires considerable teacher expertise. A specific challenge is the need to balance disciplinary and interdisciplinary learning appropriately. Ideally, the two "should be in a mutually beneficial relationship" (p. 66); effective interdisciplinarity has the disciplines as "a vital point of reference" (Ecctis, 2021p. 66).

Ensuring the disciplines drawn upon in interdisciplinary learning are appropriately balanced is important if pupils are not to feel as though they are "taking several courses simultaneously." (Tonnetti & and Lentillon-Kaestner, 2023; p. 8). A "strong hierarchy among disciplines" is found to lead some to be "put at the service of others" (Tonnetti & and Lentillon-Kaestner, 2023; p. 7), with a resulting "pseudointerdisciplinarity".

Given time is always a limited commodity, it might be reasonable to argue interdisciplinary learning takes place at the cost, to some degree, of single discipline depth or breadth (Reddy, 2023). Beyond school, there may be progression paths into employment that require pure disciplinary study at higher education level in order to progress to a high level of specialist knowledge. This may hinder candidates if that deep or broad specialist knowledge is lacking, (Reddy, 2023).

A systematic review of interdisciplinary teaching practices in secondary schools (Tonnetti & Lentillon-Kaestner, 2023) found difficulties for both pupils and teachers. Some authors found negative effects on pupil learning: if used as the only approach, and particularly when interdisciplinary integration is weak (i.e. multidisciplinary or pseudointerdisciplinarity), pupils can suffer from gaps in their disciplinary knowledge, with "confused learning or difficulties in managing the globality of the information received" (p. 10).

There are also prerequisites in pupil knowledge and understanding. A characteristic of project-based learning, a specific form of interdisciplinary learning, is that learners "acquire new knowledge only as a necessary step in solving" the sorts of ill-structured, cross disciplinary problems that are "representative of professional practice" (Walker & Leary, 2009; p. 12). This indicates that the utility of project-based learning lies primarily in contexts where learners have "vast amounts of factual information, unsure of its connection to their future practice" (*ibid.*). In fact, "there is no consensus" and "heated debate" on the value and efficacy of project-based learning, argue Strobel and van Barneveld (p. 44) in their meta-synthesis of meta-analyses comparing project-based learning to conventional classrooms to ask 'when is [project-based learning] more effective?'. They find that learners must possess the "cognitive scaffolding necessary" to assimilate new information into their existing cognitive schema (existing mental framework) (Strobel & van Barneveld, 2009; p. 49).

For teachers, difficulties relate to the way their professional identity is bound up with disciplinary specialisation: they naturally prioritise their own knowledge area and may be

reluctant to branch into other areas where they do not have expertise. Subject area experts may also find it challenging - and even against their understanding of the role of a teacher - to adopt the guiding and supporting role required of interdisciplinary teaching. A typical teacher has not had training at the pre-service stage, and so lacks competence and therefore confidence to "engage in joint projects" (p. 11). Lack of guidance for teachers can also present a barrier here.

Interdisciplinary teaching requires more collaborative efforts from teams of teachers, who must find time to plan and work together more than might be otherwise typical. This is "[o]ne of the biggest" barriers to successful implementation of interdisciplinary learning (Weller & Appleby, 2021; p. 2). Teachers knowledge about and enthusiasm for is also "one of the key variables for successful interdisciplinarity", with their support and collaboration having a "heavy impact" (Ecctis, 2021; p. 70).

While there is little research into the assessment of interdisciplinary learning in schools as the assessment system is almost entirely geared towards subject disciplines, we know from the assessment, for example, of Science, Technology, Engineering, and Mathematics (STEM) courses, that different subjects tend to have different assessment methods and that teachers find it difficult to assess interdisciplinary learning reliably, often lacking a repertoire of assessment methods, (Gao et al., 2020).

Given the complexity of this pedagogical approach, it is important to exercise caution when considering the direct application of project-based learning to school settings, where the nature of learning is typically more generalised and less connected to the advanced knowledge required for professional practice. Project-based learning may arguably be applied more successfully in learning contexts where knowledge depth is substantial, and connected to the kinds of complex, practice-oriented challenges seen in professional domains. The complexities in involved in integrating insights from different fields "involves a knowledge and skill of its own" (Peterson & Stockdale, 2022; p. 3), not least because discrete fields have their own "theories, methodologies, and terminologies" (Reddy, 2023). There is work to do in developing methods to help this process (p. 3). Project-based learning also requires a "certain level of confidence and skill" before pupils can engage with it effectively (Lucas & Hanson, 2021, p. 28).

While project-based learning is aimed at developing both subject knowledge and problem-solving, if a teacher uses it primarily as a motivation tool, or they don't believe it has efficacy for developing creative thinking, for example, its ability to deepen knowledge or develop skills such as scientific or creative thinking is likely to be tempered (Lucas & Hanson, 2021; p. 26-7).

3.4 How does interdisciplinary learning sit within the current education climate?

Most educational jurisdictions organise their curricula by subject disciplines, although, as we saw in 2.4, there are examples of curriculum innovation in a number of countries. That said, within subject-based curricula there is a long history of certain subjects being grouped together, for example the Humanities or STEM subjects. In practice this may refer

more to how the timetable is organised rather than describe any genuine interdisciplinary practices.

For the last two decades a significant driver for jurisdictions to consider interdisciplinary learning has come from the growing interest in what is misleadingly often termed 21st century skills or competences such as creativity, critical thinking, communication and collaboration (Care et al., 2019; Care et al., 2018; Lucas, 2019). Interdisciplinary learning also features strongly in the International Baccalaureate qualification route (Ecctis, 2021).

There are a small number of centres of excellence researching the growth of interdisciplinary learning at higher education, for example, the University of Oslo's Center for Interdisciplinary Education (Center for Interdisciplinary Education, n.d.). Closer to home, Scotland's Curriculum for Excellence has a focus on interdisciplinary learning and this has recently been strongly advocated by the Royal Society of Edinburgh (2020).

The London Interdisciplinary School, the first university of its kind in the UK with an interdisciplinary undergraduate degree (London Interdiscplinary School, 2021; Peterson & Stockdale, 2022) also offers professional development opportunities for schools and colleges wishing to develop interdisciplinary opportunities for pupils.

The English National Curriculum remains a steadfastly subject-based system, with its associated accreditation, albeit with the provisos and examples already mentioned in 2.4. and with a general observation that there is nothing preventing state schools from offering interdisciplinary experiences provided that they can demonstrate their adherence to the requirements for curriculum content coverage.

3.5 What is Waldorf's distinctive approach to interdisciplinary learning?

Waldorf's holistic approach to learning, intertwining academic subjects with artistic and physical activities to foster creativity and well-rounded development, is broadly an interdisciplinary one. Key to this is the requirement for teachers to co-design a cross-curricular approach, adapted and tailored to the children they teach.

The integration of "arts, music, and practical skills with traditional academic subject matter" (Friedlaender et al., 2015; p. 7) was adopted early on as a core Steiner practice. Interdisciplinary learning is a Steiner pedagogy that integrates multiple disciplines to enhance the educational experience, taking the form of thematic, cross curricular learning in blocks of time, where a topic is explored from different perspectives.

A given topic will involve the collaboration of specific curricular areas to ensure they are aligned and support one another (Pountney, 2019). In a report considering how Steiner/Waldorf curriculum can be developed and rationalised in a way that is received well with school inspectors (who do welcome "non-standard, or alternative approaches to the curriculum… especially ones that are well-articulate and coherent (Pountney, 2019; p. 13)) the authors (Biddulph et al., 2020; p. 13) argue that good practice means subject disciplines are still a central focus "even when topics are taught in a cross-curricular way" (p. 14)

Waldorf education also seeks to be knowledge rich, with knowledge both gained and generated, and knowledge applied (Rawson & Bransby, n.d.) through practical and

authentic situations. The knowledge “generated by students” (Rawson & Bransby, n.d.) is “enriched through the appreciation of existing knowledge”. Different forms of knowledge including “artistic, scientific, experiential, emotional ways of knowing” are all valued (*ibid*.).

Good practice, according to Woods et al. (2005) includes “opportunities for the continuous, deep level study of a specific topic, which includes the possibility of cross-curricular working and subject integration.”. This may be facilitated by a unique feature of Steiner education (its “most significant feature” (Woods et al., 2005; p. 55); its daily structure of a two hour ‘main lesson’ followed by subject lessons for all age groups (Woods et al., 2005) over a period of four weeks (Biddulph et al., 2020).Main lesson period includes a daily round of artistic activities that involve “connecting with the seasons and theme being studied” (Biddulph et al., 2020; p. 38).

Interdisciplinary approaches are not seen as a replacement for subject-specific teaching, but “multiple learning modalities: art, music, handwork, movement, speech, reading, storytelling, hands-on experimentation, practical life skills, and connection to nature… are taught both discretely and through an interdisciplinary approach”. For example, content on the theme/topic of nature might be taught through the modalities of art (e.g. by drawing plants), music (by singing about nature), hands-on experimentation (through science experiments with plants), practical life skills (through gardening), storytelling (through stories set in nature). In subject-specific teaching, those modalities might be used to teach technical content. For example through modalities of art, technique and style might be taught; rhythm and melody through music; narrative structure through storytelling; scientific principles through hands-on experimentation.

4 Play

Perhaps play would be more respected if we called it something like "self-motivated practice of life skills", but that would remove the lightheartedness from it and thereby reduce its effectiveness. So we are stuck with the paradox. We must accept play's triviality in order to realize its profundity.
(Gray, 2013, p.156)

4.1 What is play?

Learning through play is widely recognised as an essential component of early years education and is increasingly acknowledged as important in the Primary phase. According to Play England (Shackell et al., 2008)

> *Play is what children and young people do in their own time, for their own reasons. When playing, children choose what to do, how to do it and who to do it with. Play takes many forms: doing nothing in particular; doing lots; being boisterous; showing off; being contemplative; being alone; being social; being challenged; being thwarted; overcoming difficulties. Through play, children explore the world and learn to take responsibility for their own choices.* (p.9)

But approaches to and definitions of play vary significantly depending on the pedagogical philosophy adopted. To make sense of the range of play practices, the LEGO Foundation develop a continuum of play framework, later promoted by UNICEF (2018). This continuum categorised play into five broad types: physical play, play with objects, symbolic play, pretend play, and games with rules (Whitebread et al., 2017). These categories help articulate the range of play behaviours children engage in, from spontaneous and imaginative free play, to more structured, adult-guided activities.

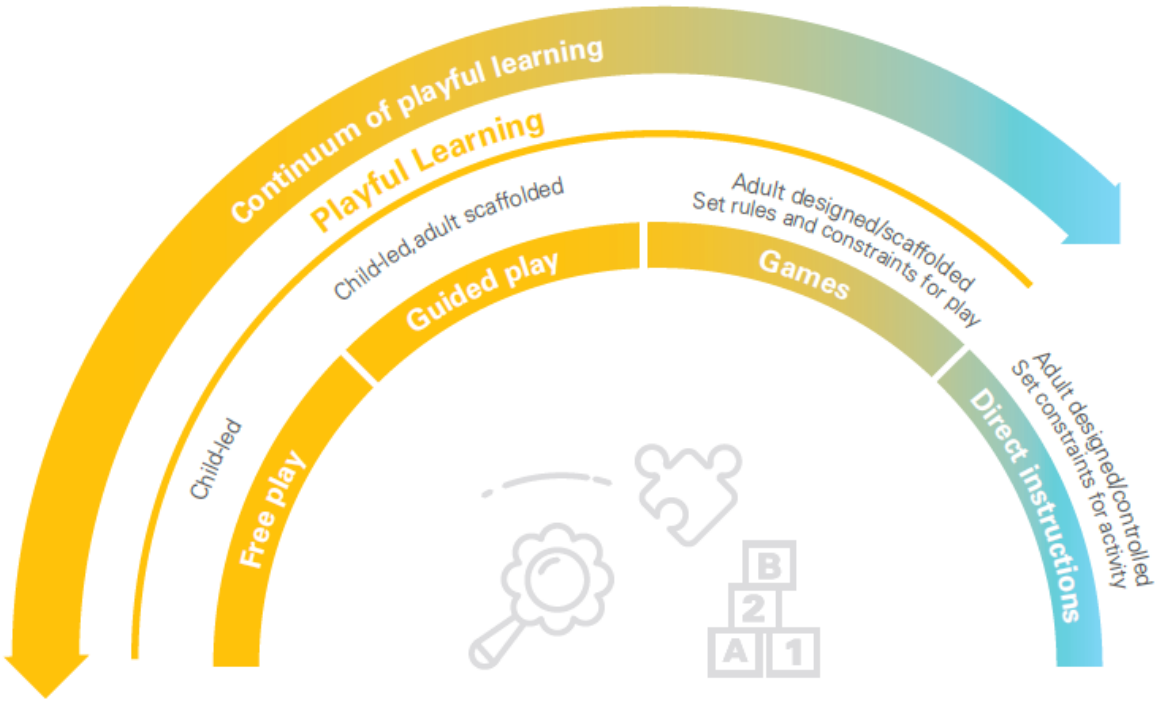

Figure 2 - A Continuum of playful learning (UNICEF, 2028)

LEGO refers to the whole continuum as ‘playful learning’, with ‘play-based learning’ being one of the approaches within it. Other authors sometimes refer to the spectrum itself as ‘play-based learning’. At one end of LEGO’s continuum is child-led free play, characterised as a spontaneous, imaginative activity driven entirely by children’s interests. This form of play is said to foster creativity, exploration, and social-emotional development in an unpressured context. Examples include pretend play, storytelling, building, or problem-solving initiated by the child.

Moving along the continuum, guided play (Skene et al., 2022) is still child-centred but involves adult scaffolding. Adults may introduce materials, ask questions, or shaped the environment to prompt learning, while allowing the child autonomy in directing the activity. In Waldorf settings, this type of guided / directed play would typically be classified as “playful learning” (Waldorf Education, n.d.; p. 1), an approach less central than free play to Waldorf, but still recognised. While Waldorf sees the benefits of play predominantly in the first category, others argue for play-based (guided) learning as achieving “the combined benefits of play and traditional teaching” particularly in an early years education context (Skene et al., 2022; p. 1162). (Skene et al., 2022; p. 1162; Wright et al., 2024; p. 2). Paterson’s literature review refers to ‘play-based pedagogy’, which “requires a balance between play activities and teacher-led instruction” (p. 96).

Games - a little further along the continuum - are typically structured activities with specific rules and outcomes, often aimed at fostering teamwork, competition, or developing specific skills. Games might have an educational aspect, but they are more focused on achievement or progress within defined parameters. Physical Education (PE) could be positioned within this spectrum at the games level. A planned curriculum; PE aims to teach specific physical activities, teamwork, and the importance of health. It emphasises the development of physical skills, fitness, and well-being.

At the far end is direct instruction, where adults lead learning with specific objectives. While traditionally seen as separate from play, even direct instruction can incorporate playful elements, such as exploration tasks, outdoor activities, or team challenges, that maintain child engagement and a sense of agency. Such instruction, while managed and outcome-driven, can still provide space for creativity and enjoyment.

Strictly speaking, direct instruction may precede any activity where play can then manifest, even if it is just an introduction to play time. Adults using direct instruction to inform play may design or control an activity, which is introduced with verbal instruction and maybe demonstration. Activities might range from experimentation with scope for pupil choice, to outdoor team-building exercises; both are carefully manged and directed, but with clear room for playfulness. As such, direct instruction should not be characterised as free of opportunities for playfulness.

Early childhood educators have “challenged the dichotomization” between play and learning (Bubikova-Moan et al., 2019; p. 778) in recent years, and there has been a shift towards the middle region on the playful learning spectrum learning in early childhood education (Skene et al., 2022; Wright et al., 2024). Bubikova-Moan et al. (2019) argues that it is important that differentiation in pedagogy meets children’s developmental needs, with

a variety of experiences between these two pedagogies allowing "for optimal opportunities for personal, social and academic growth" (Wright et al., 2024; p. 2).

Wright describes this balance of pedagogy as both a "science and art"; ensuring activities labelled as 'play' truly include "autonomy, choice and the perception of control" (Wright et al., 2024; p. 2). Perception of play can be enhanced with "cues children associate with play, such as being physical, not at a desk…" (Wainwright et al., 2020; p. 567). In this regard, Lau distinguishes between 'playful learning' and 'play-based learning', where the autonomous 'self' is "manifested" better through playful learning (Lau, 2018; p. 365).

Examples of play could include

- Loose parts construction: children freely build structures using natural or recycled materials (stones, crates, fabric), developing spatial reasoning, collaboration, and problem-solving.
- Role-play worlds: creating and acting out narratives in a 'castle', 'shop', or 'jungle' using costumes and props, fostering storytelling, social-emotional skills, and symbolic thinking.
- Exploration of natural materials: mixing water, mud, leaves, or sand to create potions or 'recipes', supporting sensory exploration and early scientific investigation.
- Cardboard creativity: transforming boxes into vehicles, houses, or spaceships through cutting, painting, and negotiation, encouraging imagination, design thinking, and persistence.
- Following a fascination: a child discovers ants and spends time observing, drawing, or building an 'ant city' – leading to emergent learning in biology, maths (counting), and geography (habitats).
- Free access to art and mark-making: with paints, chalk, or charcoal, children create for their own purposes, developing fine motor skills, expression, and aesthetic awareness without adult-imposed outcomes.

4.2 What evidence is there of how play benefits pupils?

Perhaps unsurprisingly given that play does not appear on the formal curriculum, there is a lack of robust evidence and practical guidance on how to effectively implement learning through play in schools, and on the conditions that support its success, (Parker et al., 2022). The existing evidence base does, however, suggest several benefits of play, both for academic outcomes and for the development of key learning habits and skills.

Different types of play support different areas of development. Child-led free play is often linked with social-emotional growth, while educator-directed play tends to support cognitive skill development, conceptual understanding, and academic competence (Grieshaber et al., 2021; Paterson, 2020; Wright et al., 2024). Paterson (2020; p. 98) concludes that play-based pedagogy can integrate both developmental and academic aims, fostering such skills as communication, cooperation, and self-regulation (Paterson, 2020; p. 110).

The LEGO Foundation's comprehensive review (Whitebread et al., 2017) draws on research from psychology, neuroscience, anthropology and education. While much of this research is associative rather than causal, it presents broad support for the role of play in development. Similarly, the Education Endowment Foundation (n.d.-b) notes that although the evidence base is not strong, there is a clear relationship between play and early learning outcomes, particularly in language, literacy, and numeracy. Play-based approaches also appear particularly beneficial for children with social, emotional, and educational difficulties.

Whitebread et al. (2017) review five categories of play:

- Physical play: Limited but promising evidence suggests it supports physical health, academic progress, cognitive self-regulation, and social competence. Rough-and-tumble play may particularly benefit boys' emotional and social development and possibly academic, though indirectly.
- Play with objects: Though studies are mostly small-scale or correlational, there is reasonable evidence linking it to the development of language, mathematical, and spatial skills.
- Symbolic and language play: Language play is well-supported as enhancing language development, which in turn supports self-regulation and academic achievement. Musical play may support communication, higher cognitive functions, and self-regulation.
- Pretend play: Some evidence links it to meta-learning skills such as self-regulation and executive function, though its role in language and emotional skills is limited and mixed.
- Games with rules: Relevant board games are associated with improved numeracy. Evidence on unstructured playground games and their role in developing social and emotional skills is limited and mixed.

Play appears to impact learning through several mechanisms:

- Joy and engagement: Perceiving an activity as play can enhance motivation and cognitive engagement (Whitebread et al., 2017).
- Social interaction: Playful exchanges, especially with knowledgeable adults, can promote learning.
- Meaning-making: Play helps children link new concepts to enjoyable, relevant experiences, enhancing understanding.

A meta-analysis by Skene et al. (2022) found that guided play had a greater positive effect than both free play and direct instruction on early maths skills, shape knowledge, task switching, and a greater effect than free play on spatial vocabulary.

Key learning habits and skills potentially developed using play include:

- socio-emotional development
- communication
- cooperation
- self-regulation

- social competence
- spatial skills
- numeracy skills.

4.3 What evidence is there of any limitations of play-based approaches?

While the LEGO Foundation's review (2018) does not identify explicit negative effects of play, it does raise some important considerations that point to potential limitations in certain contexts. For instance, playing with a poorly informed or misguided partner can result in the transfer of incorrect information or ineffective strategies, potentially leading to maladaptive learning.

More broadly, the limited volume of high-quality research into the impact of play in schools is itself a significant constraint (Parker et al., 2022). There are two main challenges contributing to this gap. First, definitions of play are not standardised; play exists on a spectrum ranging from child-initiated to teacher-led activities, and terms like 'guided play' are used inconsistently across studies (Skene et al., 2022). This makes it difficult to clearly identify the nature of specific interventions. Second, because play is traditionally associated with early childhood settings, it is challenging to isolate or describe how it functions within primary schools. There is also a lack of consistent frameworks for evaluating its outcomes (DeLuca & Hughes, 2014).

While some generalisations can be made about play, its appropriateness as a pedagogy naturally depends on age and there will be noticeable differences of emphasis depending on the age of the pupil. Its role changes even into higher education, where it can be powerful also, though it takes a very different form - and there are more types of play than could ever be fully listed (James, 2019; p. 10).

This raises a wider question: how important is play beyond the early years? While this overview cannot address the question in depth, it is worth highlighting as an area for further reflection. Individual theorists have argued that play remains developmentally valuable into later childhood and adolescence. Peter Gray's (2013) *Free to learn,* drawing on evolutionary psychology, suggests that children are intrinsically motivated learners who thrive when given freedom to play, explore, and interact with others without close adult direction. His argument aligns with traditions of 'unschooling' and open education that gained prominence in the 1960s and 70s. These approaches have long attracted critique – not only for idealising children's natural curiosity, but for underestimating the structured supported often needed to develop more abstract or effortful forms of knowledge Chudacoff (2013). Brown and Vaughan (2009; p. 5) p. 5 also emphasise the evolutionary roots of play, arguing that it fosters empathy, intelligence and "lies at the core of creativity and innovation".

In a more classroom-focused context, Anna Craft (2007) links playful engagement to what she calls 'possibility thinking', highlighting its role in supporting creativity in both primary and secondary education.

4.4 How does play sit within the current education climate?

Article 31 of the UN Convention of the Rights of the Child affirms that "Every child has the right to relax, play and take part in a wide range of cultural and artistic activities" (UNICEF, n.d.). Globally, play is most consistently associated with early childhood education, particularly in pre-school settings, and its prevalence tends to decline as formal schooling begins – though the age at which this transition occurs varies widely. For instance, in several Scandinavian countries, formal education starts later, allowing children prolonged access to play-based learning.

The concept of play itself is culturally situated, however. Most research originates from Western, developed contexts, and what constitutes a 'playground' or play activity can differ substantially across cultures (Courtois et al., 2024). This variability reminds us that while play is often presented as a universal good, its implementation and meaning are shaped by local values, resources, and expectations.

Skene et al. (2022; p. 1162) identify a long-standing debate over the benefits of free play and direct instruction, although recent years have seen a "conceptual shift" towards recognising play-based learning. In several jurisdictions, such as British Colombia (Wright et al., 2024), educational frameworks acknowledge a continuum of pedagogical choices that includes play as a legitimate and valuable part of the curriculum.

In England, play is a foundational element of the Early Years Foundation Stage (EYFS) and features prominently in both the statutory framework (Department for Education, 2024) and the Ofsted inspection criteria for early years settings. The framework asserts that play is "is essential for children's development, building their confidence as they learn to explore, relate to others, set their own goals, and solve problems" (p. 17). It promotes both child-led and adult-guided play as key to early learning.

A core component of much early years practice in England and Wales is 'continuous provision', a UK-specific term denoting environments that enable child-initiated exploration through accessible, open-ended resources. This approach ensures that learning can continue independently in the absence of direct adult instruction. As Bryce-Clegg (Bryce-Clegg, 2025; p. 5) explains, continuous provision allows children to practise key skills such as symbolic mark-making, cutting, joining, and attaching, particularly within Reception (age 4-5) and nursery (age 3-4) settings.

Beyond the early years, however, the role of play becomes less visible. The English National Curriculum makes only passing references to play in Key Stages 1 and 2, and by secondary education, it is largely absent from official discourse. This diminishing emphasis marks a sharp contrast with the early commitment to play as essential to development, suggesting either its decreasing importance for development, or a disjunction in pedagogical priorities as children progress through the education system.

This raises an important and often overlooked question on the role of play for older children and adolescents.

This opens up an important question of how important play is to later development. this question is not one we can answer fully in this overview, but highlight it as an area for

further thought. Associated with the play-as-learning approach, there is a school of thought that children should be allowed to explore what they want to learn. the assumption is that children are rational beings that will learn what they need from play. Peter Gray's *Free to Learn* argues from an evolutionary psychology perspective that children learn best when they can roam freely, unencumbered by adults, mixing play-filled lives with knowledge learned during playful interactions and experimentation. Chudacoff (2013) highlights the history of critiques of this 'unschooling' or 'open education' approach which recognise that such projects were unsuccessful because "they too naively expected children to behave rationally and to learn all they needed to know from play" when learning is, in fact, "difficult work". Nevertheless, Gray's recommendation that enabling children to play freely, and relatively safely, with other children, is one of the most important things parents can do for them would give some weight to the argument that play remains important.

4.5 What is Waldorf's distinctive approach to play?

In Steiner/Waldorf settings, play is not merely a leisure activity but is regarded as the foundation of learning and development. The curriculum is purposefully designed to support children's physical growth and the strengthening of their will, enabling them to pursue self-directed goals (De Souza, 2012; p. 51).

This stands in marked contrast to the priorities often seen in state schools. According to a report by Waldorf Education (n.d.; p. 1), mainstream expectations, shaped by Ofsted, place strong emphasis on early literacy and mathematics, leaving less space for free play. Teacher-led instruction is becoming increasingly prevalent in such settings (Biddulph et al., 2020; p. 36).

The key difference between Steiner/Waldorf and state/maintained educational philosophies lies in how play is valued. Waldorf literature (De Souza, 2012; Rawson, 2024; Rawson & Bransby; Woods et al., 2005) consistently highlights the developmental importance of play in the early years, followed by imagination in middle childhood and creative thinking in adolescence (Biddulph et al., 2020; p. 33). As children mature, they gradually transition to more formal learning involving listening, waiting, and structure participation (Rawson, 2024; p. 30).

This developmental model is rooted in the belief that children from birth to age seven primarily learn though play, imitation, and example, natural, unconscious processes rather than deliberate educational choices (De Souza, 2012; p. 52). These processes are deeply interconnected: children often imitate real-world experiences through play, blending observation with imaginative re-enactment (ibid.).

Consequently, Waldorf education delays formal instruction until after age seven. Before then, child-initiated free play, uninterrupted by adult direction, is considered essential for physical, emotional, and imaginative development. Such extended play allows children to process and make sense of their experiences (Biddulph et al., 2020). Educators structure environments to facilitate these natural learning processes, while remaining observant and ready to offer carefully judged guidance when necessary (Biddulph et al., 2020; p. 36; Woods et al., 2005)

By contrast, different priorities within the early years curriculum in maintained schools, especially following the 2006 Rose Review, have led to a reduced emphasis on play. The push for early literacy, especially through systematic synthetic phonics, has shaped teaching priorities. While the debate surrounding early reading methods ("the Reading Wars") (Pearson, 2004) is extensive, international data suggests reading attainment in England has improved since the Rose Review (Elliott, n.d.; p. 7).

While independent Steiner/Waldorf early years settings do not have externally imposed tests such as the phonics check or Key Stage 1 SATS (Elliott, n.d.) based on their philosophy of introducing reading much later, an unintended consequence in maintained schools may well have been a loss of wider development opportunities (Alexander, 2010, cited in Elliott, n.d.).

Elliott points to research cautioning about the likely impact of reading policies, including to "the detriment of areas of wellbeing and early development", and at the expense of "wider development goals", possibly even "understanding when reading" and lower reader enjoyment and life satisfaction, not to mention "teachers' agency" (p. 10-11). The independent Cambridge Primary Review expressed concerns that the developmental objectives of the Early Years Foundation Stage (EYFS) – made non-statutory in 2014 – were being undermined by the pressure to have children begin reading and writing at the earliest opportunity (Alexander, 2014; p. 4). Alexander writes:

> *What government failed to understand - and regrettably this goes for some schools too – was that young children learn at least as much outside school as within it and that some of this learning is of a kind that schools can't replicate. Researchers calculate that school effects count for only about 30 per cent of pupil attainment.* (Alexander, 2014; p. 4-5)

Elliott, reflecting on both psychological literature and personal experience transitioning from mainstream to Waldorf education, explores the idea that a more balanced approach, combining phonics with whole-text strategies, could preserve teacher autonomy and better support children's self-concept as readers (Elliott, n.d., p. 7-8).

While Waldorf settings delay reading instruction, they are not anti-literacy. Rather, their approach emphasises readiness, joy in learning, and broader developmental needs. In contrast, although phonics-based instruction in mainstream settings has led to measurable gains in decoding ability (Mills, 2021; p. 90), this alone does not guarantee reading comprehension. Decoding frees cognitive resources for understanding, but true comprehension also depends on background knowledge, cultural capital, and a rich, broad curriculum (Mills, 2021; p. 93).

In summary, Waldorf's distinctive approach to play is grounded in a developmental philosophy that sees play as essential for learning in early childhood. It contrasts with the prevailing accountability-driven model in state schools, where early literacy targets often dominate. While both systems aim for educational success, their routes diverge significantly – one prioritising child-led developmental readiness, the other more focused on measurable early outcomes.

5 Creative education

Creative thinking: A process through which knowledge, intuition and skills are applied to imagine, express or make something novel or individual in its contexts. Creative thinking is present in all areas of life. It may appear spontaneous, but it can be underpinned by perseverance, experimentation, critical thinking and collaboration.
(Durham Commission, 2019, p.2)

5.1 What is creative education?

There is no single, universally accepted definition of creative education. Creativity is commonly associated with imagination, originality, and the production of novel ideas (Runco & Jaeger, 2012), but the term's meaning is often blurred by its varied uses – 'creative thinking', 'teaching creatively', 'teaching for creativity' and so on. Further confusion arises from the longstanding assumption that creativity in schools belongs chiefly to the arts.

In recent decades, creativity has tended to be framed as a future-facing skill; a cognitive capacity to solve problems, think divergently, or innovate in preparation for the demands of the 21st century economy. It is often described in skills-based, goal-oriented terms, with an emphasis on measurable outcomes. This approach can be overly functional, viewing education as a pipeline to workforce readiness. It might equally be framed as something that helps children find meaning and enjoyment now.

Against this backdrop, one of the first models to be specifically developed for schools is the Centre for Real-World Learning's (CRL) five-dimensional model (Lucas et al., 2013) that offers a practical way for schools to think about how creativity can be fostered across the curriculum. Being imaginative and inquisitive are creative habits widely recognised as important in the generation of creative thinking. To these, CRL adds persistent, collaborative, and disciplined. These habits reflect not just capacities for idea generation, but also the behaviours and mindsets needed to bring creative work to completion:

1. If pupils are to learn to be **persistent** they will need opportunities to develop their work through mistakes and arrive at a better solution.
2. Genuinely **collaborative** situations that allow diversity of thought to iterate ideas go beyond simply trying out team roles but can help foster truly original thinking.
3. A **disciplined** approach to problem-solving recognises the benefits of becoming accomplished through consistently working on the skills that are needed to improve both now and for the next problem.

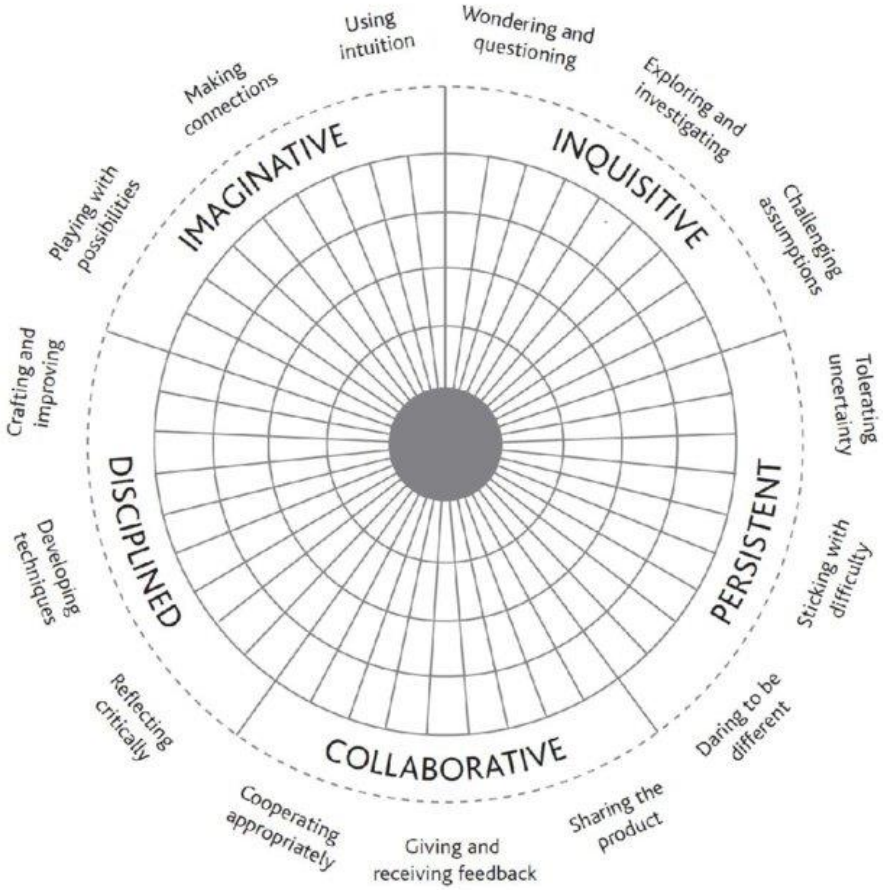

Figure 3 - Lucas et al. (2014) Five-dimensional model of creative habits

Within this framework, creative education, often termed 'teaching for creativity, means teaching subject content in ways that also nurture these creative dispositions. The aim is not merely to cover material in engaging ways (teaching creatively), but to foster learners' own capacity to think and act creatively across all disciplines.

Such a framework is helpful as teachers consider the meaning of creativity. While the accepted definition of a creative product or outcome is that it has both novelty and value, recognising the behaviours or habits that lead to creative outcomes is of more utility to teachers, because it allows them to think about what progression in creativity might look like for learners.

The *Durham Commission on Creativity and Education* (2019) distinguishes these concepts clearly:

- *Creativity: The capacity to imagine, conceive, express, or make something that was not there before.*
- *Creative thinking: A process through which knowledge, intuition and skills are applied to imagine, express or make something novel or individual in its contexts. Creative thinking is present in all areas of life. It may appear spontaneous, but it can be underpinned by perseverance, experimentation, critical thinking and collaboration.*
- *Teaching for creativity: Explicitly using pedagogies and practices that cultivate creativity in young people,* (p.2).

This view aligns with scholarly understanding of creative education: as a purposeful, structured attempt to develop creative thinking and behaviours, often through frameworks that allow for progression and assessment.

In a teaching *for* creativity framework, creativity might be encouraged through:

- Design challenges in STEM: tasks such as building a bridge from limited materials to encourage problem-solving, critical thinking, and imagination, while developing teamwork and resilience.
- Philosophy circles or debates: structured opportunities for pupils to explore open-ended questions, express original ideas, and think flexibly, fostering creativity in thought and communication.
- Cross-curricular projects: for example, planning a new playground integrates maths, literacy, art, and design technology, encouraging creativity through real-world problem-solving and collaboration

In summary, creative education can be broadly understood in two ways. In mainstream educational discourse, it is often framed as the deliberate cultivation of creative thinking skills – measurable (generally formatively), teachable, and applicable across subjects. In contrast, Waldorf education offers a holistic vision: creativity as an embodied and developmental process that emerges organically through a rich, imaginative curriculum. Both perspectives offer valuable insights into what it means to educate for a creative life, but they differ in emphasis, method, and educational philosophy.

5.2 What evidence is there of how creative education benefits pupils?

There is a growing consensus of the importance of creativity and creative thinking in education (Care et al., 2018; Lucas, 2022; Vincent-Lancrin et al., 2019; World Economic Forum, 2015). Creativity in this context refers to a broad set of cognitive, emotional, and behavioural capacities – including problem-solving, persistence, and the ability to define problems effectively (Mumford & England, 2022) – that can benefit pupils both during their time in school and in later life.

The increasing emphasis placed on creativity is evidenced by the global testing body PISA (Programme for International Student Assessment) introducing a dedicated Creative Thinking assessment in 2022. Results from this assessment (OECD, 2024) show positive correlations between creative thinking and academic performance in core domains such as maths, science, and reading. This suggests that creative thinking and academic attainment can be mutually supportive, though one is not necessarily a prerequisite for the another" (OECD, 2024; p. 5).

Before turning to specific evidence of impact, it is worth noting that by definition, a creative individual is one who is open to ideas and able to play with them, to take risks, and adapt to changing conditions, to demonstrate optimism, initiative, and ingenuity (Alberta Government, 2016, cited in Lucas, 2022). They are inquisitive, collaborative, and willing to persevere (Jiading district of Shanghai's Creative Compass, cited in Lucas, 2022). They are imaginative, but also disciplined in their pursuit of solutions (Lucas et al., 2013). In developing CRL's model, we have synthesised research that indicates the close relationships that exist between imagination, inquisitiveness and persistence, although

whether these are simply correlates with or caused by interventions to develop creativity is open to discussion.

There are a number of increasingly well-evidenced specific examples of the benefits of creative education. It enhances wellbeing and can lead to an enhanced state of engagement and concentration, sometimes referred to as 'flow' (Csíkszentmihályi, 1996). The Durham Commission (2019) highlights increased confidence and wellbeing as outcomes, while Blanca Ruiz-del-Pino and colleagues (2022) found improvements in problem-solving and divergent thinking in primary-aged pupils.

Emerging evidence from the *Creativity Collaboratives* programme in England – established following the Durham Commission - further illustrates the impact of teaching for creativity at a more granular level. Teachers using pedagogies that aimed to develop children's creative thinking perceived children to experience "deeper learning" and a "greater sense of ownership" (Sowden et al., 2025), specifically through "giving children more choice in how they show us what they have learnt and what they know" (p. 6).

A smaller body of literature has explored the role of craft in supporting wellbeing and learning. Benić found that craft activities may positively influence mood and contribute to a positive classroom environment (2018). Adams-Price and Morse (2018; p. 93), reviewing studies on long-term participation in culturally meaningful crafts (i.e. serious hobbies) among older adults, identified benefits such as improved cognitive functioning and greater life satisfaction – potentially arising from factors like identity, master, and social recognition.

The All Party Parliamentary Group for Art, Design and Craft in Education (Broadhead et al., 2022; p. 13) links craft education to transferrable skills relevant for future employment, and also suggests links to mental health and reduced loneliness, though these claims are not evidenced.

Collier et al. (2016), in their review of textile-based craft and mood, draw on the concept of 'flow' and suggest that highly engaging, focused craft activities can promote positive mood and overall wellbeing. Similarly Bukhave et al. (2025), in a systematic review of craft-based treatments for mental health, found that while most studies reported short-term improvements across a range of outcomes (e.g. anxiety, self-efficacy, mood, and life satisfaction), the evidence base remains limited by methodological weakness.

A broader perspective is offered by Mason (2005), who reviewed diverse bodies of literature on the social and emotional value of home-based crafts, taking into account leisure and health studies, family studies, and women's studies. She questions the dominant vocational discourse around craft and highlights its wider relevance to wellbeing and identity. Her review found that craft is often pursued not only to develop creativity *per se*, but for a variety of personal and cultural reasons – ranging from enhancing quality of life or home aesthetic, to transmitting heritage, feminine values, and shaping family identify. In this context, craft is seen as a meaningful life activity, contributing to self-confidence, contentment, and a sense of purpose. An important observation from Mason is that "artist-oriented theories of craft" tend to have a "fixation with creativity" (p. 262), overlooking the diverse motivations and outcomes associated with craft practices,

especially in domestic or leisure contexts. This distinction may resonate with perspectives in Waldorf education, where craft is valued not primarily as a means of cultivating creativity in the abstract, but as a formative, embodied experience – integrating head, heart, and hands – and contributing to the development of the whole child.

Key learning habits and skills potentially developed through creative education include:

- Curiosity
- Problem-definition
- Problem-solving
- Risk-taking
- Persistence
- Collaboration
- Deeper learning
- Wellbeing.

5.3 What evidence is there of any limitations of creative education?

Until the recent Creativity Collaboratives in England, there have been few systematic 'test-beds' to rigorously evaluate the impact of creative education on young people. While the habits associated with creativity are widely viewed as self-evidently positive, many claims about its benefits are made on the basis of assumption rather than empirical evidence. These are often presented as plausible assertions and repeated across the literature, sometimes without clear reference to primary sources.

For instance, Egan et al. (2017) assert that creativity is essential for pupils to develop content knowledge, citing Livingston (2010) in support. However, Livingston's work is conceptual rather than empirical; her statement that "creativity is necessary to accomplish this goal" is a proposition rather than a tested conclusion. This illustrates a wider issue: the tendency within some strands of the literature to rely on plausible but untested assertions. A key example is the assertion that, because business leaders across the world identify creativity as the number one skill needed for the future workforce, it must therefore be the solution to a wide range of global challenges. This argument often proceeds without critical examination of what is actually meant by 'creativity' in these contexts. It is far from clear that the notion of creativity invoked by a CEO of a technology firm, for example, aligns with that of a craftsperson, a teacher, or a cultural policymaker – or that these understandings correspond with the definitions adopted by quasi-governmental bodies or educational frameworks. Without shared definitions and a clearer understanding of what kinds of creativity are needed, in which contexts, and to what ends, such assertions risk obscuring more than they reveal.

Where empirical research does exist, findings are often nuanced. Gajda et al (2017), in a meta-analysis exploring the link between creativity and academic achievement, found a positive but modest correlation. This suggests a more complex relationship than in sometimes assumed. In fact, given that academic success is typically measured by tests that reward convergent thinking and correct answers, it may be less surprising that highly creative or divergent thinkers may not consistently outperform their peers within traditional frameworks.

One very specific aspect of the Steiner approach, eurythmy, is cited by proponents as supporting the development of concentration, self-discipline, aesthetic awareness and sensitivity to others (Pountney, 2019; p. 8). While the goals and use of 'eurhythmics' - a practical and secular approach to music training using rhythmic movement and aural training to develop musicality and a sense of inner rhythm as a vehicle for music mastery - is fairly well documented, this review found no meta analyses or systematic studies that examine eurythmy's educational impact. For eurythmy - a spiritual and artistic practice - the movement is an end in itself, aiming to harmonise body, soul and spirit. It aims to express the spiritual and inner nature of language and music through movement as 'visible speech and visible song', and is central to Steiner's holistic approach to human development. This review finds no evidence of its impacts upon children, though in a clinical sense the approach finds mixed evidence for the potential efficacy of eurythmy therapy for certain conditions (Lötzke et al., 2015).

In sum, while there is growing recognition of the potential benefits of creative education, there remains a need for more rigorous, independent research to establish causal relationships and assess its impact across diverse contexts. Assertions must be distinguished from evidence, and a clearer understanding is needed of when, how, and for whom creative pedagogies are most effective.

5.4 How does creative education sit within the current education climate?

It is increasingly widely held that creative education is essential for preparing young people to thrive in an unpredictable and rapidly changing world. Globally, there is a growing consensus that creativity is not only desirable but teachable, and that it supports both academic success and the development of lifelong skills. The international momentum is reflected in the inclusion of creativity in the curricula of more than 20 educational jurisdictions (Care et al., 2018; Fadel, 2021), and most notably in the OECD's development of a PISA Creative Thinking Test (2022), which provides a robust framework for assessing creativity across nations.

Historically, the modern push to embed creativity in education can be traced back to Guilford's (1950) call for scientific study, and Torrance's later work in the 1960s, which operationalised creativity as problem-solving and idea generation. These early foundations have evolved into more sophisticated educational frameworks, such as those articulated by Lucas (2022), reflecting both the complexity of creativity and the urgency of equipping young people with flexible, imaginative habits of mind.

In England, a key milestone was the publication of the NACCCE (National Advisory Committee on Creative and Cultural Education) report in 1999, chaired by Ken Robinson. The report powerfully argued for a national strategy to support creativity and cultural education for children – not just the artistically gifted – signalling a shift in national discourse. Its legacy informed later initiatives such as the Durham Commission (2019), which made a strong, research-led case for embedding creativity across the education system, emphasising its relevance to both individual flourishing and national economic resilience.

Despite these high-profile calls for reform, England's current educational climate reveals a more ambivalent state. Unlike Scotland and Wales, where creativity features explicitly in the national curricula, it remains notably absent from the English National Curriculum. While creative teaching and learning undoubtedly occur in many English classrooms – as illustrated by examples collected by the Creativity Exchange (n.d.), these remain localised rather than systematic.

5.5 What is Waldorf's distinctive approach to creative education?

The Waldorf approach offers a contrasting view: creativity not as a discrete set of skills or habits to be developed, but as a way of being that permeates the entire educational experience. Waldorf education takes a uniquely holistic and aesthetic approach to creativity. Creativity in this context is not confined to artistic expression in the traditional sense but is embedded across the curriculum through painting, music, movement, handwork, and eurythmy (movement in response to speech and music (Pountney, 2019)). These are not treated as enrichment activities but as fundamental to educating the whole child - head, heart and hands - as discussed in section 3.2.

For example, creative learning in a Waldorf context might include:

- Eurythmy: a form of expressive movement integrated into the curriculum, used to embody language and music artistically, supporting spiritual and emotional development through rhythm and form.
- Main lesson books: instead of standard worksheets, children create their own illustrated books to record learning across subjects, combining drawing, writing, and design to foster imagination and individual expression.
- Seasonal festivals and storytelling: rich, artistic celebrations of the year's rhythms through music, poetry, drama, craft, and oral storytelling that cultivate cultural sensibility, inner development, and aesthetic appreciation.

The aim is not to cultivate creativity as a utility-driven or employability skill, but rather to nurture the child's full humanity - body, soul, and spirit. Creativity is cultural and formative: it is about becoming, not merely achieving, or even self-expression, as 'art' is often understood in schools. Instead, it is cultivated through the child's sustained engagement with processes, materials, and ideas, and with the inner rhythms of learning.

Rooted in Steiner's idea of educating head, heart, and hands, creativity is inseparable from imagination, moral and spiritual development, "artistic sensibilities" (Woods et al., 2005; p. 58), and direct experience of aesthetic endeavour. Rather than teaching *for* creativity as an outcome, Waldorf education encourages creative appreciation as children engage with the process and rhythms of learning and growth.

While elements of head and heart are present, Waldorf's creative philosophy perhaps most strongly emphasises the hands. The focus on crafts – such as sewing, woodwork, metalwork, gardening and weaving – is not vocational, but educational in the fullest sense. These practical, tactile activities are valued not for their utility in future employment, but for the role in developing aesthetic sensibility, a sense of purpose and spiritual inspiration (Rawson, 2024; p. 35), along with physical confidence as children "apply this to real bodily work" (Rawson, 2024; p. 26). Craft also connects pupils to their environment "using locally

sourced material with an embodied cultural history" *(ibid.)* and to others around them. In this sense, craftsmanship, defined by Sennett (2008) as the desire to do something well for its own sake, embodies the creative habit of being disciplined and contributes to forming a grounded individual.

We place outdoor learning and forest school-style approaches within this pedagogical section not because experiential learning, interdisciplinary learning or play pedagogies cannot take place outdoors, but to reflect Waldorf's broader philosophy: learning is not disembodied or abstract, but is nurtured through hands-on engagement with the natural world. Learning in connection with nature has multiple dimensions of knowledge, social, physical and spiritual development, and deepens aesthetic appreciation.

Finally, the boundaries between our four pedagogies blur somewhat in the comparison with Hanson and Lucas's idea of 'practical learning', associated with the interdisciplinary and inquiry-based approaches. Like Waldorf handcrafts, practical learning is hands-on and skill-building. The philosophical intent differs, however: in non-Waldorf settings, practical learning often has instrumental aims – imparting knowledge or developing competencies. In contrast, Waldorf's approach to handwork is not primarily outcome-driven. While both may be holistic in practice, their underlying purposes diverge. We try to bear these distinctions in mind when reviewing evidence of effectiveness.

A parallel perspective, such as that promoted by the Calouste Gulbenkian Foundation (Robinson, 1982; Tambling & Bacon, 2023) echoes the Waldorf emphasis on the intrinsic value of the arts, but from a secular and cultural standpoint. It sees the arts not merely as tools for improving other outcomes, but as essential to human flourishing, cultural understanding, and ethical development. Creativity is a means of fully engaging with life, not simply preparing for a job. This perspective is a more secular, culturally grounded version of the (old) humanistic tradition in creative education. While Waldorf education frames creativity as a way to nourish the child's soul and support spiritual development, integrating arts deeply into curriculum as vehicles for inner development (e.g. Eurythmy), the Gulbenkian approach emphasises children's s rights to self-expression, access to high-quality arts education, and collaboration with practising artists. It reflects a secular, culturally grounded version of the humanistic tradition, focused on personal, social, and cultural growth.

In defining creative education, Waldorf's approach stands apart in its insistence that creativity is not a discrete skill to be measured or extracted, or a tool for future success, but a mode of being that permeates the whole curriculum. Rooted in the holistic development of head, heart and hands, it integrates artistic, practical, and spiritual dimensions of learning to nurture the child's full humanity. Creativity is woven through the curriculum and cultivated through meaningful, aesthetic, and embodied experiences – valued not for utility, but for their role in personal growth, moral development, and connection to the world.

Creative education, in the context of Waldorf schools can be summarised as follows:

- Artistic and aesthetic development - Waldorf education emphasises the development of pupils' "artistic sensibilities" (Woods et al., 2005; p. 58) for their

own sake as well as for wider skills, through activities such as painting, drawing, sculpture, eurythmy storytelling, poetry, and oral expression. These activities foster an appreciation for art.

- Holistic development - A Waldorf education aims to awaken cognitive, emotional, social, and spiritual faculties in a balanced way, encouraging physical, behavioural, and intellectual maturation.
- Rhythm and structure - Connected with the idea of a creative education is the concept of 'rhythm' in lesson structure and activities. Lessons are structured with rhythmic activities like singing, movement, and recitation, aligning with natural "mental and bodily rhythms" (Woods et al., 2005; p. 18). An example of the rhythmic shapes found in lessons is seen in "the teaching of material such as multiplication tables through the use of rhythmic movements" (ibid.). The use of rhythm and repetition to learn content is dismissed as 'rote learning' in some contexts, but this Waldorf principle demonstrates the value of selecting appropriate teaching methods: there are times where repetition is the most appropriate approach to learning, and these do not detract from a child's ability to practise creativity.
- Teacher creativity and autonomy - Building on the idea of choosing the most appropriate teaching method for the task at hand; a Waldorf principle is that teachers adapt lessons creatively based on the needs of their pupils. When a "subject can be taught in a hundred different ways" (Pountney, 2019; p. 8) this gives room for innovative teaching methods and a flexible curriculum.
- Integration of arts across subjects - Arts are integrated into academic subjects like maths and science. Blending intellectual and artistic spheres (if indeed they can be split this way) may foster an enriching learning experience.
- Practical learning - While the 'creative education' and 'experiential learning' pedagogies are two distinct features of Waldorf education, there is some blurring of boundaries when it comes to defining 'creative education'. Naturally, hands-on (experiential) activities such as crafts, gardening, and manual skills are essential to creativity. Waldorf's education has a strong emphasis on these elements, bridging academic and vocational learning
- Character and moral development - Waldorf education has an "artistic approach to moral education" (Woods et al., 2005; p. 144)
- Cultural and community engagement - These could be described as part of the creative education approach. Festivals and cultural events are integral to the curriculum, encouraging reverence, respect for spiritual essence, and participation in the school community (Woods et al., 2005; p. 155).
- Focus on lifelong learning It encourages independent thinking, critical inquiry, and lifelong learning by developing sophisticated skills and fostering curiosity (Pountney, 2019; p. 8).

In essence, Waldorf's creative education is an artistic, holistic, and flexible approach to teaching that integrates arts, rhythm, experiential learning, and moral development to nurture free-thinking, well-rounded individuals.

6 Learning from Waldorf principles and practices

Since we can't know what knowledge will be most needed in the future, it is senseless to try to teach it in advance. Instead, we should try to turn out people who love learning so much and learn so well that they will be able to learn whatever needs to be learned.
(Holt, 1982)

6.1 General overview

This report has explored how four key pedagogical approaches - experiential learning, interdisciplinary learning, play, and creative education - are understood and implemented in Waldorf education, and how these compare with mainstream educational practices. Each of these approaches feature to varying degrees when exploring the growing interest across the world (though not in every country) in more holistic, child-centred approaches to teaching and learning. When implemented well, each of these pedagogies has been shown to support a range of positive outcomes for children and young people, including engagement, motivation, deeper understanding, and the development of transferrable skills and dispositions.

Waldorf has a long-standing tradition of using these pedagogies as core components of its curriculum and philosophy. It integrates play, experiential learning, creativity, and interdisciplinary learning not as add-ons or enrichment, but as foundational to its vision of educating the whole child - intellectually, emotionally, and spiritually. In doing so, Waldorf anticipates or exceeds what parts of mainstream education are only recently beginning to embrace more systematically.

There is, for example, increasing emphasis in mainstream curriculum reform on preparing young people for a complex and fast-changing world by focusing on capabilities such as creativity, critical thinking, collaboration, and adaptability. In this respect, Waldorf education is working in harmony with the direction of much international educational development. Its emphasis on rhythm, relationships, hands-on learning, and the arts places it firmly within global conversations about the need for education systems to nurture not just knowledge, but also human qualities and dispositions.

At the same time, this report recognises the importance of balance. While Waldorf prioritises the development of the whole person, it remains important to ensure that skills and dispositions are grounded in strong subject knowledge. A deep understanding of concepts and content provides the foundation from which critical and creative thinking can flourish. This is particularly important in systems where external assessments or national curricula place explicit demands on knowledge acquisition. Waldorf educators may find it helpful to continue engaging with how best to meet these requirements in ways that remain true to their principles.

It is also important to recognise the long history and strong evidence base for the value of the pedagogies explored in this report. Play, for instance, is recognised in the UN Convention on the Rights of the Child as essential to children's wellbeing and development, especially in the early years. Experiential and interdisciplinary learning are

increasingly being supported by research that shows their positive impact on engagement and understanding when done well. Creative education is likewise valued not only for its intrinsic worth, but also for its role in supporting personal growth, problem-solving, and lifelong learning.

In promoting its practices, Waldorf education can strengthen its case by making more explicit links with the evidence base around these pedagogies. While much of what Waldorf does is based on deeply held beliefs about child development and human flourishing, making space for reflection on what improves learning - and how this can be evidenced - could support wider understanding and advocacy. This also means developing strong internal support structures for teachers, including ongoing professional development, to ensure the consistent quality of teaching and learning across settings.

Ultimately, the pedagogies explored in this report show that the aims of Waldorf education - to nurture capable, thoughtful, and well-rounded human beings -need not be seen as separate from the goals of contemporary mainstream education. Rather, when used reflectively and with high-quality practice, they offer a powerful complement to more conventional approaches. A whole human can also be a better learner. And a better learner is one who has the tools not just to know the world, but to act for good within it.

6.2 The four pedagogies

Teaching in ways that genuinely support play, creativity, interdisciplinary and experiential learning requires real professional fluency. It demands deep subject knowledge, but also the pedagogical skill to design and sequence meaningful curriculum experiences. When thinking about the play continuum, for example, knowing how to calibrate the balance between free exploration and direct instruction requires expertise. One reason such approaches sometimes fall short in mainstream settings is that they are difficult to execute well without highly skilled teachers.

Definitions also matter. Terms like ‘play’ or ‘experiential learning’ are often used loosely, but in practice they must be precise and pedagogically coherent to be effective. These approaches are not about doing less, or letting go of knowledge, but about engaging pupils in ways that are aesthetically rich, intellectually demanding, and developmentally grounded. At their best, they reconnect education to the public good - valuing art, making, and growth for their own sake, as well as for future outcomes.

6.2.1 Experiential learning

Waldorf education’s commitment to experiential learning is grounded in its holistic philosophy of educating the head, heart, and hands. The emphasis on direct, embodied experience through crafts, nature, movement, and artistic expression aims to create a rich and meaningful educational environment. Research on experiential learning reminds us that experience alone is not sufficient for deep learning, however. Learning happens when experiences are consciously reflected upon and connected to broader concepts.

While Waldorf naturally supports experiential approaches, it may benefit from more explicitly integrating structured opportunities for reflection and abstract conceptualisation into its pedagogy. This could ensure that pupils not only engage with the world through

experience, but also make sense of it in a way that supports critical thinking, intellectual development, and transferable understanding.

6.2.2 Interdisciplinary learning

In almost all schools, including Waldorf settings at secondary level, the timetable is fundamentally structured around subject disciplines. Intentionally organising learning around interdisciplinary themes therefore requires deliberate planning, significant teacher expertise, and strong coordination across subjects. While interdisciplinary approaches such as problem-based learning have been shown, when implemented well, to foster deep understanding and transferable skills, they can be challenging to deliver effectively without clear structures and support.

Waldorf education, particularly in the lower years, naturally lends itself to interdisciplinary learning through its thematic, story-based teaching and integration of arts, sciences, and humanities. To sustain this strength through the upper years, however - where subject specialisation becomes more pronounced - Waldorf educators may wish to consider how best to support collaboration between teachers, maintain coherence across disciplines, and ensure that interdisciplinary learning is both rigorous and purposeful.

6.2.3 Play

While there is a rich literature exploring the role of play in child development more broadly, there is comparatively little research into the specific benefits and limitations of different kinds of play within formal school settings. For Waldorf educators, the right to play is a core principle, grounded in a view of the child as a whole person whose development is supported through self-discovery and imaginative exploration.

Within this philosophy, however, and in the context of external academic demands such as examinations, it is important for Waldorf teachers to make carful pedagogical decisions about when to prioritise open-ended, child-led play and when more structured, direct instruction is appropriate. Developing the professional judgement to strike this balance - while staying true to Waldorf's developmental principles - is a key aspect of high-quality teaching in this context.

6.2.4 Creative education

There are two quite distinct views on creativity in education. On the one hand, many international policy frameworks and curricula promote *teaching for creativity* as a way to equip young people with adaptable, future-oriented skills. On the other, Waldorf deeply values creativity but takes a fundamentally different approach - viewing creativity not as a discrete skill to be taught and measured, but as a way of being that should infuse all learning. In this area, Waldorf diverges more strongly from the global mainstream than it does in its use of experiential, interdisciplinary or play-based pedagogies.

While this philosophical stance is grounded in a rich tradition of holistic education, Waldorf educators may benefit from engaging critically with emerging research on creative education. Doing so could help articulate how Waldorf's distinctive approach aligns with - or offers a meaningful alternative to - the prevailing 'teaching for' narrative, while ensuring that creative development is both intentional and visible in practice.

6.3 Lessons for Waldorf UK

As well as learning to share with other schools, there are, inevitably, lessons for Waldorf UK and the wider Steiner-Waldorf movement from any review of practices drawing on external evidence and scrutinising changing education policy glob ally and in England.

In strategic terms Waldorf UK might like to:

- Make the case publicly for the value of the four pedagogical practices, drawing on the kinds of evidence contained in this report. At the same time the kinds of skills and dispositions which Waldorf education seeks to cultivate can be made more explicit, as can their value in enabling young people to flourish in rapidly-changing times.
- Acknowledge the tensions between education policy in England and Waldorf approaches, avoiding unnecessary binary positions. So, for example, the power of reflection can be stressed (alongside experience); the value of core knowledge and key concepts within individual disciplines, alongside interdisciplinary learning; the importance of children having access to the full gamut of play-based learning, of disciplined approaches to reading such as phonics as well as freer exploration; and the fullest interpretation of what it is to be creative in every aspect of the curriculum.
- Be clear about the potential limitations of each of the four pedagogies explored in the report and, drawing on evidence, how such limitations can be minimised. In this regard there is, in the research team's thinking, a question about how to position eurythmy and anthroposophy, for neither of which there is strong evidence of benefit at school.
- Anticipate potential critique of the Waldorf practices described in the report and marshal evidence which refutes or mitigates these.

In operational terms Waldorf UK might like to:

- Map the overlap with and distinctions between current education policy in England and Waldorf approaches, explaining in clear language why Waldorf schools make the choices that they do.
- Summarise the key learning points from each of the four sections exploring the four pedagogies and share with teaching staff.
- Provide an ongoing programme of evidence-based continuous professional development and learning for teaching and support staff.
- Identify expert teachers from within the four pedagogies and film them in action for use in professional learning.

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