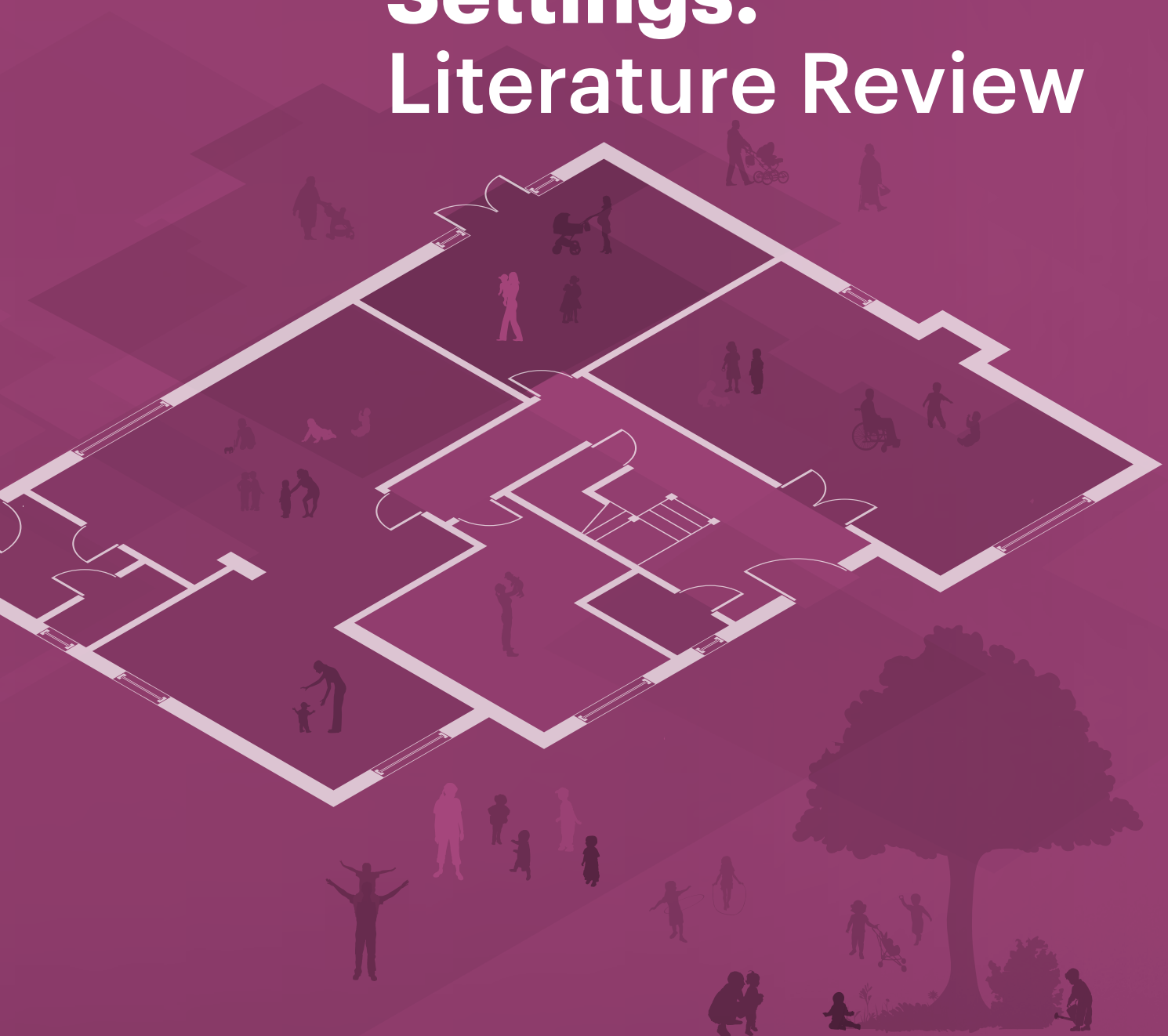




Rialtas na hÉireann
Government of Ireland

Universal Design Guidelines for Early Learning and Care Settings: Literature Review





An Roinn Leanaí
agus Gnóthaí Oige
Department of Children
and Youth Affairs



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Frequently used acronyms

AIM - The Access and Inclusion Model (AIM) is a model of supports designed to ensure that children with disabilities can access the Early Childhood Care and Education Programme

AT - Assistive Technology

CEUD - Centre for Excellence in Universal Design

DCYA - Department of Children and Youth Affairs

ELC - Early Learning and Care / ELCS - Early Learning and Care Setting

ICT - Information and Communications Technologies

NDA - National Disability Authority

UD - Universal Design

QRF - Tulsa Early Years Quality and Regulatory Framework

Executive Summary

Introduction

This literature review was undertaken as part of a research project to develop **Universal Design Guidelines for Early Learning and Care settings** and associated built environment Universal Design self-audit tool.

This project was coordinated by the Centre for Excellence in Universal Design at the National Disability Authority (CEUD-NDA) on behalf of the Minister for Children and Youth Affairs, Dr. Katherine Zappone, T.D. The Department of Children and Youth Affairs (DCYA) funded the development of these Guidelines, to support the implementation of the Access and Inclusion Model (AIM).

This literature review has examined evidence-based research regarding best practice in early childhood provision and Universal Design (including best practice in Inclusive Design, Design for All and Accessible Design). The results have been synthesised as a set of findings and provide key recommendations to underpin the guidelines and self-audit tool.

Universal Design (UD) is the design and composition of an environment so it can be accessed, understood and used to the greatest extent possible by all people, regardless of their age, size, ability or disability. This includes public places in the built environment such as buildings, streets or spaces that the public have access to: products and services provided in those places; and systems available including Information Communications Technology (ICT).

Early Learning and Care (ELC) settings provide one of the most important environments that infants, toddlers and young children experience in their early lives. These settings must provide inclusive environments that cater to a diversity of children with varying abilities and a range of care and learning needs. They must also provide a supportive working environment for the staff working in these settings. Finally, they must support the families who use the buildings every day. Considering the important role played by all members of a child's family, the settings must take into account the wide spectrum of ages, sizes, abilities or disabilities these families will represent.

To examine these issues and provide an evidence base for the guidelines and audit tool, this literature review has examined a wide range of empirical and expert based material in a national and international context. The findings that emerged from this review provide a synthesis of two key areas related to a UD approach for ELC. Firstly, the key pedagogical and care issues for ELC settings that inform the overall UD approach, and secondly, the key built environment issues that underpin a UD environment that is accessible, understandable and easy to use by all children, staff and family members. The findings are grouped into eight categories and these are discussed below.

Key Findings

These themes below include the overall policy background, identify the diversity of users to be catered for, sketch out the UD approach and philosophy that frames the overall endeavour, and then highlight the key pedagogical and ELC issues. Only then can we start examining the main built environment implications and requirements for the proposed UD ELC guidelines and audit tool.



Figure 1: Key Findings

Inclusive ELC Recent Developments in Ireland

Underpinned by a government commitment, influenced by research on the efficacy of ELC and the core principles of human rights; social justice and equality of opportunity, early childhood in Ireland has undergone a seismic transformation in recent years, culminating in First 5, A Whole-of-Government Strategy for Babies, Young Children and their Families 2019-2028 (2018). These developments form a natural policy background for UD and a more inclusive ELC sector.

Diversity of ELC Users and the Need for an Inclusive Approach

Inclusive Early Learning and Care, as demonstrated by the policies above, takes a holistic view of the child and embraces human diversity. This aligns with the UD approach to the built environment where due consideration is given to all users including children, family members, staff and visitors. This is echoed by the Diversity, Equality and Inclusion Charter and Guidelines for Early Childhood Care and Education (Department of Children and Youth Affairs (DCYA), 2016) which acknowledges the diversity of a typical ELC, and argues that these settings must embrace the needs of all children and provide an inclusive and accessible environment to ensure equal participation and access to culturally and developmentally appropriate play-based indoor and outdoor activities.

Beyond children with disabilities, this research and findings highlight the UD philosophy, which recognises that diversity is the norm, a position that is testified to by the wide range of people who attend, work in, or visit a typical ELC daily. This spectrum runs from an infant to an older person who might be a childminder or grandparent who drops-off and picks up the child every day. Within this is a range of ages, sizes, abilities and disabilities represented by the children, staff and family members who will use the building every day.

Convergence between UD and Inclusive ELC Policy

Universal Design, as defined in the introduction to these key findings, promotes inclusive built environments that are accessible, usable and easy to understand. UD is much more than removing barriers; it is about providing an actively supportive environment. In this context, a UD approach can help provide the supportive, healthful, and child-centred environment required to fulfil the inclusive early years policy focus discussed above.

Síolta, the National Quality Framework for Early Childhood Education

Síolta is the national quality framework for early childhood care and education in Ireland. It was published by the Centre for Early Childhood Education in 2006. It establishes 16 quality standards that all early childhood services should work towards. These standards of quality are underpinned by 12 principles.

Design and Spatial Requirements Framed by Key Síolta Standards

The Síolta quality principles embody the vision which informs and provides a context for quality practice in Early Learning and Care (ELC) in Ireland. Síolta, (CECDE, 2006:6) in the first of its twelve principles affirming the value of early childhood, states that 'Early childhood is a significant and distinct time in life that must be nurtured, respected, valued and supported in its own right' Other key principles include Children First; Parents; Relationships; Equality; Diversity; Environments; Child Welfare; the Role of the Adult; Teamwork; Pedagogy and Play. The principles of quality underpin the standards and components of quality, which further elaborate on, and define quality practice. The breadth of the sixteen Síolta standards is very wide, incorporating the Rights of the Child; Environments; Parents and Families; Consultation; Interactions; Play; Curriculum;

Planning and Evaluation; Health and Welfare; Organisation: Professional Practice; Communication; Transitions; Identity and Belonging; Legislation and Regulation and Community Involvement.

Following extensive consultation with both the partners and Steering Committee, six of the sixteen Síolta standards were selected for the purposes of the development of the **Universal Design Guidelines for Early Learning and Care settings** (See Figure 2 below). Given that the UD Guidelines relate completely to ELC environments, clearly standard two: Environments is inextricably linked and underpins the investigation of the other six standards.

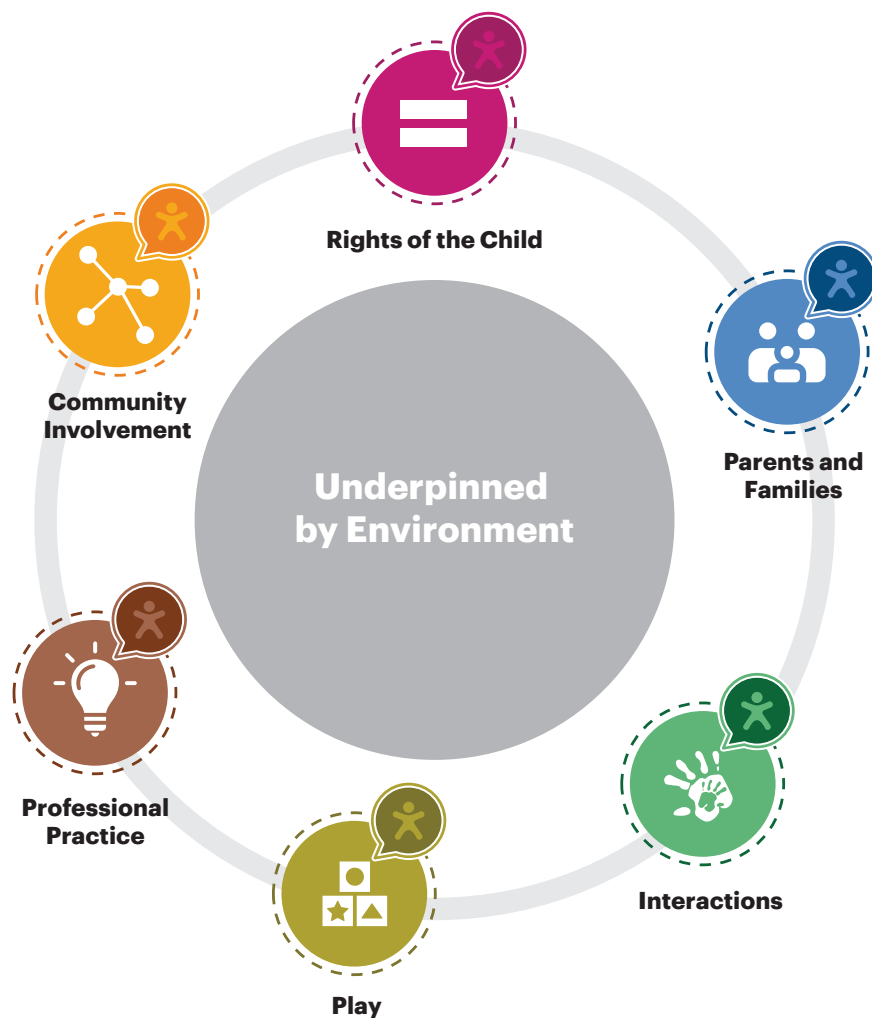


Figure 2. Síolta standards guiding the literature review

A detailed literature review was conducted to investigate these six standards and draw out the main implications for the ELC built environment. The following sections present each standard and sketch out some of the main spatial and design considerations for each one. These considerations are discussed in line with each standard, but it is acknowledged that there may be an overlap between many of these.

Standard one: The Rights of the Child Key built environment considerations include: large scale issues relating to how well settings are connected and integrated with the community; building layouts and design that allow children to freely circulate and associate with their peers; down to spaces and materials, which allow each child to freely express himself/herself through a range of media.

Standard three: Parents and Families Key considerations include: the provision of accessible, welcoming spaces for parents/ELC practitioners to interact with each other and staff; environments that reflect the diversity of parents/families; and space to accommodate families, including extended families for specific occasions.

Standard five: Interactions Among other issues, the setting should provide: a mixture of large and smaller indoor and outdoor spaces for children to explore and navigate; spaces, resources and provocations to maximise children's engagement in learning; dining environments that mirror family meal-time rituals; and the balance of environmental stimuli.

Standard six: Play Some of the most important design considerations include: adequate indoor and outdoor space for children to play; accessible, understandable and easy to use outdoor play spaces that are well integrated with the interiors; consider covered outdoor areas; and a range of stimulating spaces and materials to promote communication, encourage problem-solving, critical thinking, and a sense of identity and belonging. Play spaces should also range from unstructured to structured, facilitate solitary and group play.

Standard eleven: Professional Practice Provide spaces that promote adult-child interactions to support children's learning and development; encourage a culture of reflection in the physical environment; and, provide for a flexible environment that acknowledges the role of the ELC practitioner as environmental planner, participant and evaluator.

Standard sixteen: Community Involvement Provide settings that are well connected and integrated, and enhance visibility between the setting and the community; make children's expression visible in the local community and incorporate projects in the setting that are directly linked to concerns in the local community.

Integration and Interface with the Community

A number of the Síolta Standards (CECDE, 2006) emphasise the importance of community and societal interaction; for example, Standard three: Parents and Families, or Standard sixteen: Community Involvement. For the built environment to support these aspirations it must adopt a relational approach, where the physical environment enables positive relationships between the ELC setting as a whole and the local and wider community. In design and spatial terms this means a setting that is physically well integrated with the locality and that has a permeable, welcoming, and interactive interface or physical boundary with the community. While the safety and security of children is paramount, this must be balanced with the need for relational space that will help underpin the Síolta standards.

UD across Key Spatial Scales can support the Síolta Standards

In considering UD and the built environment, it is critical to think about a setting as a whole, to ensure an integrated and coherent approach, but also to consider the key spatial scales so UD is applied across the full spectrum of the built environment. These scales include: (1) ELC setting site location, approach, entry and site layout; (2) entering and moving about the ELC building; (3) key internal and external spaces; and, (4) elements and systems. At all these scales the built environment must be accessible, understandable and easy to use to ensure a continuous 'travel chain' for users of all ages, sizes, abilities and disabilities.

Most importantly though, the ELC setting is a dedicated child-centred environment and this should be reflected in the setting as a whole. While this will differ from one context to another, the setting must facilitate the primary needs of children including play, exploration and investigation; mystery and enchantment; imagination; movement and stillness; interacting socially; moving freely and risk-taking within a safe context.

Supporting Inclusive Child Development, Challenge and Learning Provocations

In the discussion of the Síolta standards above, the importance of diverse spaces, interactions and learning provocations is highlighted. Similarly, the Diversity, Equality and Inclusion Charter and Guidelines for ELC and Education (DCYA, 2016) calls for early learning and care settings to challenge and promote the individual child's abilities and development. These issues challenge the built environment to provide an appropriate level of challenge or difficulty for one set of needs or abilities (this might include a three-year-old who needs to climb and jump) while also ensuring an inclusive approach for all children (this might include a child who uses a wheelchair).

In this context, adopting a UD approach and the concept of personalisation is helpful. Personalisation allows enough flexibility and adaptability in a design to facilitate a level of specialisation, should it be required, to suit individual needs.

Co-Design through Participation and Collaboration

Universal Design promotes participatory and collaborative design that not only works with users to understand and incorporate their needs and preferences, but also involves them in the design process in a meaningful manner. Through acknowledging the diversity of users and understanding their needs, a personalised approach can be facilitated to support inclusive child development and the challenge and learning provocations discussed above, as well as the specific needs of staff and family members, and other visitors. Looking back to the Síolta Standards, from Rights of the Child to Community Involvement, a philosophy of participation and collaboration is strongly emphasised in all of the standards.

Conclusion

These findings bring the UD philosophy of inclusion and diversity together with key pedagogical and early childhood issues, to help create UD and ELC environments that are accessible, understandable and easy to use by children, staff and family members.

The review highlights many positive developments in early childhood policy and illustrates how these not only promote greater inclusion and diversity in the early learning and care context, but also align with the principles of UD.

In terms of pedagogy and early childhood, the review draws on the Síolta standards and identifies the key built environment issues required for a holistic ELC environment. In response, UD issues are then examined across key spatial scales to ensure that the ELC setting as a whole, and at each distinct spatial scale, can facilitate the appropriate levels of accessibility, usability and inclusion that such a diverse environment requires. The review supports collaboration with stakeholders, including children, around the design of their environment, arguing that children are often excluded from decision making due to a lack of appreciation by adults about their competence to contribute to this process.

Finally, this review shows how UD, in its concern for human performance, health, wellness and social participation, is also a powerful ally to progressive pedagogical and early childhood philosophies that celebrate childhood and embrace diversity in ELC.

1 Introduction



Figure 1 Carraig Briste, Enniscorthy, County Wexford.

This literature review is being undertaken as part of a research project to develop **Universal Design Guidelines for Early Learning and Care settings** in Ireland and the associated built environment Universal Design self-audit tool.

This project is coordinated by the Centre for Excellence in Universal Design at the National Disability Authority (CEUD-NDA) on behalf of the Minister for Children and Youth Affairs, Dr. Katherine Zappone, T.D. The Department of Children and Youth Affairs (DCYA) is funding the development of these Guidelines, to support the implementation of the Access and Inclusion Model (AIM).

The Universal Design Guidelines for ELC settings have been developed following a comprehensive national and international literature review, ten onsite visits to ELC settings across the country, the development of a self-audit tool and two workshops involving early learning and care practitioners and relevant stakeholders such as Tusla, built environment professionals (i.e. architects, landscape architects, planners, engineers) and officials from Government departments and local authorities, among others.

The potential of this publication is significant. It will support the ELC sector in creating universally designed spaces for all stakeholders (including children, staff and parents). It will also be useful for built environment design professionals in private and public sectors working on the design of new build and retro-fitting of ELC settings.

This literature review will examine evidence-based research regarding best practice in ELC and Universal Design (including best practice in Inclusive Design, Design for All and Accessible Design). It will synthesise the findings and provide key recommendations to underpin the proposed guidelines and self-audit tool.

1.1 Key Definitions

In the context of this research an Early Learning and Care Setting (ELC) is defined as:

An Early Learning and Care Setting (ELC) is a setting providing early learning and care to children aged from birth to six years. This may include sessional settings (where children attend for up to 3.5 hours), part-time settings (where children attend for up to 5 hours) or full-day settings (where children attend for over 5 hours). Some settings also provide school-age care to children over six years of age.

An ELC can take many forms in various locations such as: a standalone setting within the community, either privately owned or run by a not-for-profit organisation; part of a larger community/family resource centre; co-located with a primary or post-primary school; or, attached to, or part of a private dwelling. This includes childminding services undertaken by a registered childminder within their own home.

Universal Design (UD) is defined as:

Universal Design (UD) is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of their age, size or ability. This includes public places in the built environment such as buildings, streets or spaces that the public have access to: products and services provided in those places; and, systems that are available including Information Communications Technology (ICT). Disability Act 2005 (<http://www.universaldesign.ie/>)

1.2 Research Rationale, Objectives and Scope for Overall Project

Early Learning and Care settings provide one of the most important environments that infants, toddlers and young children will experience in their early years. These settings must provide inclusive environments that cater to a diversity of children with varying abilities and needs. They must also provide a supportive working environment for the ELC staff working in these settings. Finally, they must also support family members who use the buildings every day, and considering the important role played by all members of a child's family, the settings must take into the account the wide spectrum of ages, sizes, or abilities these families represent.

In this context, the overall objectives of this project are to develop **Universal Design Guidelines for Early Learning and Care settings** and a self-audit tool that will:

- support the ELC sector in creating inclusive ELC settings, buildings and spaces for all stakeholders, particularly children with a disability;
- enable better designs of newly-built ELC settings, buildings and spaces and give clear and detailed information on the retro-fit of existing ELC settings, buildings and spaces; and
- enable ELC practitioners to carry out self-audits of their settings, buildings and spaces so they can identify steps that can be taken to ensure all stakeholders can participate in these settings.

1.3 Research Scope for Overall Project

These guidelines and self-audit tool relate to all Tusla-registered Early Learning and Care settings in Ireland (see definition of Early Learning and Care (ELC) settings in Section 1.1). It does not include stand-alone school-age childcare settings, nor primary schools. There are, however, design approaches and features in a primary school that are relevant to an ELC and these will be used to inform the overall UD approach. Moreover, many ELC settings also provide school-age services for older children.

While the private residences of childminders (see definition I Section 1.1), form part of the spectrum of ELC settings, this research focuses primarily on settings outside the home, in centre based environments. These may be attached to a dwelling, but their function is primarily ELC related rather than residential. Research and guidelines regarding UD residential dwellings is already provided through the 'Universal Design Guidelines for Homes in Ireland' (CEUD, 2015).

Taking account of the above scope, and the definitions set out in the previous section, this research examines the built environment of the ELC setting across the following spatial scales:

- The location, approach and entrance to the ELC setting buildings (including key site design features).
- Internal built environment including horizontal and vertical circulation, key internal spaces, and elements and systems (i.e. materials and finishes, fit-out elements, internal environment, and technology, etc).
- External play areas which form part of the ELC setting.

1.4 Literature Review Methodology

This report focuses on two key areas related to UD approach for ELC, which include firstly the key pedagogical and care issues for early learning and care settings that inform the overall UD approach, and secondly the key built environment issues that underpin a UD environment that is accessible, understandable and easy to use by children, staff and family members.

For both focus areas, the following methodology was adopted:

- A two-strand approach literature review that included an empirical strand and an expert strand.
- Literature search criteria based on key search terms and exclusion criteria.
- A synthesis of the literature organised and synthesised as findings into categories in two different chapters: Chapter three focuses firstly on the key pedagogical and care issues, while Chapter four focuses on key built environment issues. In the first case these categories are based on the selected Síolta standards, while in the second the key built environment issues are categorised according to key spatial scales.

Further detail about the respective literature methodologies is provided at the beginning of each chapter.

1.5 Report Structure

Chapter One outlines the overall context and scope for this literature review, the rest of this report is organised into four chapters as follows.

Chapter Two presents key background information regarding UD and some of the major implications for ELC settings. It also identifies the specific needs of a number of representative ELC setting users to ensure the environment supports a diverse range of people.

Chapter Three investigates the main early childhood and pedagogical issues that must be considered as part of any UD ELC setting approach to enable it to be a safe, stimulating place for children to feel nurtured and have scope for exploration and learning.

Chapter Four examines the built environment at the key spatial scales to identify the key UD approaches, design features and elements.

Chapter Five provides a short conclusion that brings the previous chapters together. This chapter also contains a list of literature references and various appendices which provide further detail about the research process underpinning this report.

2 Background: Universal Design and Creating Supportive Early Learning and Care Settings



Figure 2. Bernie's Pre-school, Knockaine, County Limerick.

2.1 Universal Design Introduction

The term Universal Design (UD) was first coined by Mace (1998) to refer to “the design of products and environments to be usable by all people, to the greatest extent possible, within the need for adaptation or specialist design”. In Ireland, the Centre for Excellence in Universal Design (CEUD) at the National Disability Authority (NDA) refers to UD as “the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of age, size, ability or disability”.¹

¹The definition adopted by the CEUD draws on the Disability Act 2005, which defines Universal Design as meaning: “the design and composition of an environment so that it may be accessed, understood and used to the greatest extent possible, in the most independent and natural manner possible, in the widest possible range of situations, and without the need for adaptation, modification, assistive devices or specialised solutions, by persons of any age or size or having any particular physical, sensory, mental health or intellectual ability or disability.”

In a similar vein, the definition of UD adopted by the United Nations in the Convention on the Rights of Persons with Disabilities (UNCRPD, 2006) refers to 'environments ... to be usable by people, to the greatest extent possible, without the need for adaptation or specialised design'.

UD is not only about removing barriers but also about creating the right environmental conditions for social inclusion across all human abilities. Human abilities, as defined by CEN-CENELEC (2014) include; physical abilities, sensory abilities, and cognitive abilities, and these vary from person to person and change as a person gets older. Sanford (2012) also discusses human abilities, breaking these down in a similar manner except describing abilities as: motor abilities (similar to physical abilities), sensation and perception abilities (in part similar to sensory abilities), mental abilities (as above), and communication abilities. The inclusion of perception above takes account of how sensory information is perceived or processed, not just received. The addition of communication abilities is particularly relevant in the educational context and here Sanford includes speaking, writing, reading, listening, conversing, using social cues and regulating emotions, along with other similar communication abilities.

"Universal design is intended to engender both positive activity and participation outcomes by focusing on all abilities of all individuals rather than on people with disabilities alone. As a result, universal design is not just about access for some, but it is about usability and inclusion for all."
(Sanford, 2012.p.xiii)

In this regard UD moves beyond the issue of physical accessibility and promotes an integrated approach which is reflected in the design goals and design principles outlined later in this chapter and captured above in CEUD's definition of UD which focuses on environments that can "...be accessed, understood and used to the greatest extent possible." These domains of accessibility, understanding, and usability are discussed below. Accessibility is largely associated with physical (or motor abilities), sensory (sensation abilities), or age and size, and must not only address access within the ELC building, but also ease of access to the setting; Can users easily get from their home to the ELC setting; as pedestrians, cyclists, via public transport, or by private vehicle?

Understanding is principally concerned with mental abilities, sensory abilities, perception abilities (as outlined by Sanford) and communication abilities. UD in this context must cater to a variety of users in terms of intellect, cognition, learning, and memory. Among other things, aural and visual messages must be easily understood, signage must be intuitive, and wayfinding around any environment must be simple and easy to follow.

"People of diverse abilities should be able to use buildings and places comfortably and safely, as far as possible without special assistance. People should be able to find their way easily, understand how to use building facilities such as intercoms or lifts, and know what is a pedestrian facility and where they may encounter traffic."
(CEUD, 2014a)

Usability must look at how design increases the ‘usability range’ (Balaram, 2011) to foster inclusion and equality. Balaram argues that the “usability range of any product or service will increase once we view universal design as more than mere access” (p.3.5). In discussing usability, Sanford (2012) looks at human function and functionality. Function refers to human abilities (as outlined above), while functionality includes usability and is the interaction of human function and physical forms.

“Functionality is usability and inclusivity of physical form that enable engagement in activities/tasks and participation in society and societal roles. Functionality is a product of the interaction between demands exerted by physical form and human function.”
(p. 6)

Usability, and the resulting functionality of products or services, is therefore determined by how well a design caters for the full range of human abilities: motor, sensation and perception, and communication abilities. As the interaction of human function and physical form, usability is in many ways the combination of accessibility and understanding.

The UD approach advanced by CEUD offers an integrated understanding of UD which includes a UD philosophy, the UD principles, a UD process, and the concept of personalisation. The UD philosophy proposes that people should be enabled to participate in a society that takes account of human difference and should be able to interact with their environment to the best of their ability. Personalisation allows enough flexibility and adaptability in a design to facilitate a level of specialisation, should it be required, to suit individual needs. Personalisation also refers to a participatory process as it is about users shaping public services, including education.

“Personalisation is ...about putting citizens at the heart of public services and enabling them to have a say in the design and improvement of the organisations that serve them. In education this can be understood as personalised learning - the drive to tailor education to individual need, interest and aptitude so as to fulfill every young person’s potential.”
(DfES (UK), 2004.p.4)

2.2 Inclusive Pre-School Education: Recent Developments in Ireland

Underpinned by a government commitment, influenced by research on the efficacy of Early Learning and Care and the core principles of human rights; social justice and equality of opportunity, ELC in Ireland has undergone a seismic transformation in recent years, culminating in the National Childcare Scheme announced in 2016 and **First 5 - A Whole-of-Government Strategy for**

Babies, Young Children and their Families 2019 – 2028 launched in 2018. The key policy developments, and how these influenced the development of the **Universal Design Guidelines for ELC settings** are outlined below:

Better Outcomes, Brighter Futures (Department of Children and Youth Affairs (DCYA, 2014: 5) highlights in Outcome 2 of the five National Outcomes, “That all children are achieving their full potential in all areas of learning and development”. Access, in its broadest sense, is key to this. Ensuring quality services is named as one of the six transformational goals for achieving the national outcomes. The development of the **Universal Design Guidelines for ELC settings** will support these aspirations and help in their becoming a reality for all children, parents and educators.

Síolta, the National Quality Framework for Early Childhood Education (CECDE, 2006) provided a structure to guide the Literature Review on which the Universal Design Guidelines are partly based. Síolta (ibid: 6), in the first of twelve principles, The Value of Early Childhood, outlines the need for “early childhood to be nurtured, respected, valued and supported in its own right”.

The other principles include Children First, Parents, Relationships, Equality, Diversity, Environments, Welfare, Role of the Adult, Teamwork, Pedagogy and Play.

Síolta, is underpinned by sixteen standards of quality which define quality practice within the framework. The breadth of the sixteen Síolta standards is very wide and for the purposes of the development of the UD Guidelines for ELC Settings we focused on seven, namely:

- **Standard One: Rights of the Child**
- **Standard Two: Environments**
- **Standard Three: Parents and Families**
- **Standard Five: Interactions**
- **Standard Six: Play**
- **Standard Eleven: Professional Practice**
- **Standard Sixteen: Community Involvement**

Síolta acknowledges that the 16 quality standards are inextricably linked and the framework is designed to encourage cross-referencing between individual standards (CECDE, 2006). Consequently, while all standards are not explicitly addressed, the review of key pedagogical and care issues for ELC settings, is aligned with the definition of quality presented across all sixteen standards. Given the nature of this review, Standard two, Environments, is seen as underpinning the discussion on the seven selected standards. Moreover, Standard nine Health and Welfare is reinforced throughout Chapter three with emphasis placed on children’s needs for a physically and emotionally safe and secure early learning environment.

The seven selected standards of quality reflect the European Key Principles of a Quality Framework (Working Group on Early Childhood Education and

Care under the auspices of the European Commission, 2014: 8). The European Framework says “In all Member States the following transversal issues are fundamental to the development and maintenance of high quality ECEC (Early Childhood Education and Care) and underpin each statement in this proposal:

a clear image and voice of the child and childhood should be valued. Parents are the most important partners and their participation is essential in a shared understanding of quality”.

The key links in the European Framework that fuse with the **Universal Design Guidelines for ELC settings** are:

- provision that encourages participation, strengthens social inclusion and embraces diversity.
- supportive working conditions including professional leadership which creates opportunities for observation, reflection, planning, teamwork and cooperation with parents.
- a curriculum based on pedagogic goals, values and approaches which enable children to reach their full potential in a holistic way.

Aistear, the Early Childhood Curriculum Framework (National Council for Curriculum and Assessment (NCCA, 2009) is the curriculum framework for children from birth to six years in Ireland. The purpose of Aistear is to provide information for adults to support them in planning and providing enjoyable and challenging learning experiences to enable all children to grow and develop as competent and confident learners. It also has twelve principles, presented in three groups. These twelve principles intersect with Síolta and the European Principles in the areas of Environments, Play, Equality and Diversity and Parents Family and Community.

The Aistear Síolta Practice Guide (NCCA, 2015) links the principles of Síolta and Aistear, in the Curriculum Foundations section (www.aistearsiolta.ie).

Department of Education Guide to Early Years Education (EYEI) focused inspections. (DES 2018)

In 2016, the Department of Education and Skills published this framework to guide their inspections of settings providing the universal pre-school programme (ECCE). It is based on Aistear and Síolta. The Guide to the EYEI can be downloaded at: <https://www.education.ie/en/Publications/Inspection-Reports-Publications/Evaluation-Reports-Guidelines/guide-to-early-years-education-inspections.pdf>

The Access and Inclusion Model (AIM) was launched in 2016. It is a model of supports designed to ensure that children with disabilities can access the Early Childhood Care and Education (ECCE) programme. Its goal is to empower pre-school providers to deliver an inclusive pre-school experience, ensuring that every eligible child can meaningfully participate in the ECCE Programme and reap the benefits of quality ELC.

AIM is a child-centred model, involving seven levels of progressive support, moving from the universal to the targeted, based on the needs of the child and the pre-school service (see Figure 3). For many children, the universal supports offered under the model will be sufficient. For others, one particular discrete support may be required to enable participation in the Universal pre-school programme, such as access to a piece of specialised equipment. For a small number, a suite of different services and supports may be necessary. In other words, the model is designed to be responsive to the needs of each individual child in the context of their pre-school setting. It offers tailored, practical supports based on need and does not require a formal diagnosis of disability (www.aim.gov.ie).

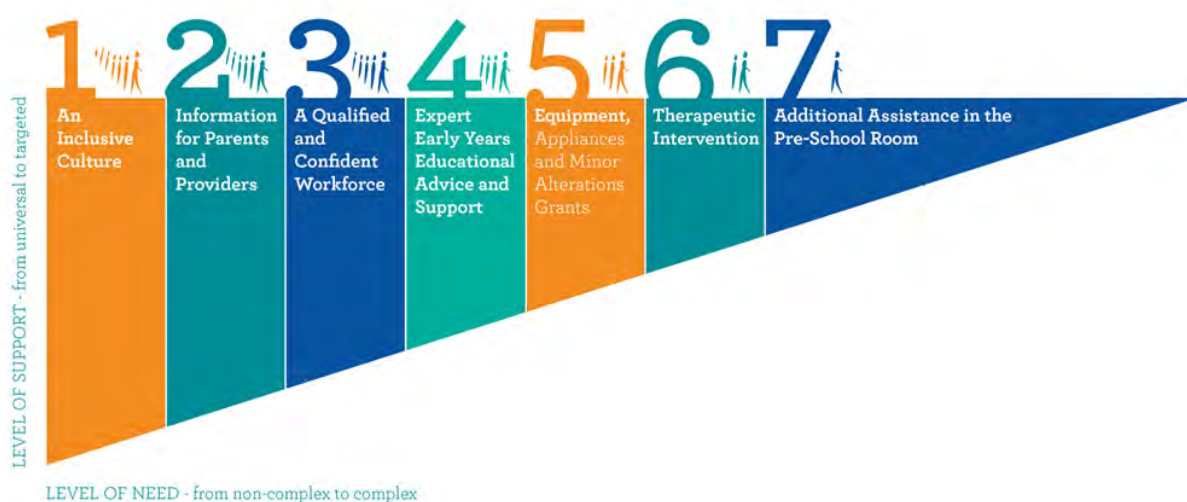


Figure 3. A Model to Support Access to the ECCE Programme for Children with a Disability

The introduction of the AIM, with its focus on enabling access to ELC for all children further represents the commitment by government to supporting universal access for all children, irrespective of need or ability (Inter-Departmental Group (IDG), 2015).

In 2016 the launch of the 'Diversity, Equality and Inclusion Charter and Guidelines for Early Childhood Care and Education' by the DCYA, saw a major step forward for inclusive ELC in Ireland. According to the DCYA the aim of the charter and guidelines is "...to support and empower those working in the sector to explore, understand and develop inclusive practices for the benefit of children, their families and wider society." And to promote "...the values of diversity, equality and inclusion for all children attending early childhood services (XI)."

Furthermore, the guidelines acknowledge the role of the physical environment and the importance of a setting that "is accessible, diverse and inclusive to all children, families and early childhood practitioners." This is particularly relevant to this review and this section of the DCYA guidelines will be examined later on in this report.

The Child Care Act 1991 (Early Years Services) Regulations (DCYA, 2016) set out the minimum criteria that must be complied with by registered early years services in Ireland. This includes services across the spectrum from purpose-built stand-alone-settings, to services attached to private dwellings, and also childminding services provided within the childminders' private residence.

These regulations cover eight key areas including: Registration; Management and Staff; Information and Records; Care of Child in Pre-School Service; Safety; Premises and Space Requirements; Notifications and Complaints; and Inspection and Enforcement.

In the context of the built environment, a number of these areas refer to specific minimum spatial and design requirements that must be complied with by all registered early years services. The Child Care Act 1991 (Early Years Services) Regulations 2016 can be accessed [https://www.dcy.gov.ie/docs/Child_Care_Act_1991_\(Early_Years_Services\)_Regulations_2016_/3780.htm](https://www.dcy.gov.ie/docs/Child_Care_Act_1991_(Early_Years_Services)_Regulations_2016_/3780.htm)

The Early Years Inspectorate within Tusla, the Child and Family Agency, is tasked with implementing the Child Care Act 1991 (Early Years Services) Regulations 2016, and with supporting services to comply with these regulations. To achieve this the Inspectorate has devised a Quality and Regulatory Framework (QRF) that sets out the core regulatory requirements of the regulations and provides supporting documentation such as best practice guidelines or samples and templates for setting-based policies and procedures.

The Early Years Inspectorate conducts pre-school inspections to monitor the sector and ensure settings are striving towards full compliance with the regulations. The Quality and Regulatory Framework can be accessed <https://www.tusla.ie/services/preschool-services/early-years-quality-and-regulatory-framework/>

Recent initiatives such as the 'Demonstration Project for In School and In Early Years Therapies' illustrate the potential for greater collaboration between ELC practitioners, therapists, and parents in many ELC settings (Department of Education and Skills (IRL), 2018). This pilot, developed by the DES, DCYA and Department of Health (DoH) is co-ordinated by the National Council for Special Education (NCSE), will include:

- Early intervention and tailored supports.
- Bringing specialised therapists into schools and pre-schools to provide tailored support to children.
- Collaboration and greater linkages between therapists, parents, teachers and other school and pre-school staff.
- Developing greater linkages between educational and therapy supports.
- Providing professional training and guidance for school and pre-school staff and parents in supporting children's therapy and developmental needs.

- **Maximising the participation of parents in their children’s communication development.**

While this initiative is at an early stage, it suggests a wider role for an ELC setting within the community and the need for settings to facilitate onsite meetings and collaborative sessions between staff, therapists, parents, and various stakeholders.

Finally, First 5 - A Whole-of-Government Strategy for Babies, Young Children and their Families 2019 – 2028 (Government of Ireland, 2018) was launched in late 2018. This is a ten-year cross-Departmental strategy to support babies, young children and their families aimed at delivering:

- 1 A broader range of options for parents to balance working and caring
- 2 A new model of parenting support
- 3 New developments in child health, including a dedicated child health workforce
- 4 Reform of the ELC (ELC) system, including a new funding model
- 5 A package of measures to tackle early childhood poverty.

This strategy has many implications for the planning and design of ELC settings and how these settings interact with and influence the design of the public realm. For instance, the strategy promotes public places that are inclusive and designed with babies and young children in mind. These should be places for children to play and learn, and provide opportunities for parents and young children to meet.

In terms of the design of settings, the strategy states that investment should facilitate the participation of all children in ELC, promote settings that are informed by UD and that are inclusive and accessible to all children, families and practitioners.

2.3 Understanding the Whole Person and the Needs of Diverse Users

Inclusive education, as demonstrated by AIM, takes a holistic view of the learner and embraces human diversity. The UD approach supports inclusive education on many fronts. Both UD and inclusive ELC increasingly consider the user or learner in biological, psychological and social terms - or as a ‘bio-psycho-social’ entity (Engel, 1981, Smith, 2002). This helps ensure a holistic understanding and treatment of the person.

The UD approach emphasises an inclusive education approach that must consider the variety of users in a typical educational environment. Petronis and Robie (2011) discuss the need to integrate everyone into all aspects of the built

environment and outline the challenges facing public educational institutions around making learning environments supportive of all regardless of their learning or physical abilities. They argue that all users must be considered – students, staff and visitors – and contend that UD seeks to provide an optimal environment for all users.

This inclusive educational approach is promoted in the Diversity, Equality and Inclusion Charter and Guidelines for Early Childhood Care and Education (DCYA, 2016: 38/39). Referring to the physical environment the guidelines highlight the following:

- General layout and accessibility of the environment for children with a disability and the need for possible environmental adaptations (e.g. for sensory exploration).
- Accessibility of information for families and children, keeping in mind language and literacy issues, accessible formats such as audio or Braille, and availability of staff who can communicate through sign language.
- Storage and accessibility of materials for all children. Placing ‘the best’ books on the top shelf means that children do not get the opportunity to explore books independently.

These guidelines acknowledge the diversity of a typical ELC setting, and align with the UD approach by arguing that these settings must:

- Ensure that service planning and provision embraces the needs of all children and works to deliver an inclusive and accessible environment for all.
- Enable all children to meaningfully participate in all aspects of the curriculum, and extend learning to challenge and promote the individual child’s abilities and development.
- Ensure that children of all abilities have equal access to culturally and developmentally appropriate play-based educational activities, both indoors and outdoors, which develop their understanding, dispositions, skills and holistic development.

In a similar manner, the Department for Children, Schools and Families (henceforth referred to as DfCSF) in the UK has prepared design guidance (DfCSF (UK), 2008) for mainstream and special schools. This guidance refers to a wide spectrum of ages including early years, and outlines four main special needs and disabilities that need to be considered in the educational setting. These include:

- Cognition and learning: specific learning difficulty (SpLD); moderate learning difficulty; (MLD); severe learning difficulty (SLD); profound and multiple learning difficulty (PMLD)
- Behaviour, emotional and social development (BESD)
- Communication and interaction: Speech, language and communication needs (SLCN); autistic spectrum disorder (ASD)
- Sensory and/or physical: hearing impairment (HI); visual impairment (VI); multi-sensory impairment (MSI); physical disability (PD)

The above guidelines refer specifically to children with special needs and disabilities in both mainstream and special schools. The needs of these children, along with a wide range of ELC setting users need to be considered as part of the diverse and inclusive approach set out in the Irish early years policy discussed earlier. In fact, the full range of users is almost infinite, especially if the setting is integrated in the locality and provides some onsite services, such as a community space. The following sections identify a small range of specific users who may have particular needs in relation to the ELC built environment. It is hoped that identifying these users will help inform the UD approach presented in this report.



Figure 4. Various ELC setting users

2.3.1 All Children

The United Nations Children’s Fund (UNICEF) describes its child-friendly schools (CFS) framework as promoting “child-seeking, child-centred, gender-sensitive, inclusive, community-involved, environmentally friendly, protective and healthy approaches to schooling and out-of-school education worldwide” (UNICEF, 2014).

Child-friendly environments must afford children space and time to play as this is an essential part of their physical, social and cognitive development (Gleeson and Creamer, 2012, Committee on Environmental Health, 2009). In the context of an ELC setting that accommodates a range of age groups it is important to provide age-appropriate social and recreation space within the setting. The Department for Education and Skills (henceforth referred to as DfES) in the UK has published guidelines around the design of school grounds and advises that provision must be made for differing children’s needs, whether this is age or ability related (DfES (UK), 2006). The adoption of certain spaces by different age groups is inevitable and it is suggested that sufficient, well designed space must be provided for different age groups to make age appropriate places, create conditions for greater positive social interaction, and reduce potential conflicts. Adopting a developmental perspective, the following overview of age-related changes, between birth and five years, is offered as a guide and acknowledges

individual variation in development. It is important to stress that each child's developmental trajectory is unique and that the role of the ELC practitioner is to support each individual child along his/her own emerging developmental path.

2.3.1a Infants (Birth to one year)

Babies develop from lying flat to acquiring great mobility. By the time they are one year old, many will have begun to sit up unsupported, crawl, observe the activities of others and show an interest in books, objects and games. Many children will be fully ambulant by around eleven months. Sleeping areas and nappy changing facilities are required.



Figure 5. Infant in Cheeky Cherubs, City Council Workplace Crèche, Cork City Hall, Cork.

2.3.1b Toddlers (one to two years)

At this age children will begin to walk, initially with poor balance, to crawling up stairs, pushing, pulling, carrying and building. They spend much of their time on the floor, crawling, squatting, sitting, kneeling or mastering their walking skills. Their balance can be uncoordinated up to about eighteen months and they can tend to fall heavily. Many will have mastered self-feeding and be able to identify some simple familiar items. At eighteen months many children are capable of running. There can be much spillage and falling at this stage and they need a lot of supervision. Sleeping areas and nappy changing facilities are important features.

2.3.1c Children (two to three years)

Between the age of two and three-years, children have mastered many of the skills they have been developing. Usually, they run with confidence, climb, build large towers, and recognise details in pictures. Their language development is progressing well and their command of language can be quite advanced.

To support the child and staff it is essential that the layout include a mixture of open space and smaller nooks to accommodate the activities in the setting. This is also the toilet training stage of development, so great consideration must be given to this important milestone. The location of and attitude to toilet training can have a profound effect on the child. It must be seen as a natural event, and children should have free access to the child-size toilets or potties and wash hand basins. Good hygiene facilities and practices are very important. Children benefit from spaces with a balance of hard and soft landscape (including grass, trees etc), and spaces that balance risk and challenge to allow children to safely challenge themselves.



Figure 6. Young child at play, Benbulbin Crèche, Sligo Town, Co. Sligo.

Shelter and shade should be provided through planting, playhouses or more flexible covers such as canopies or sails. Transitional areas between internal and external space are beneficial, particularly if they are covered and extend the indoor space. Changes in topography and a variety of textures, colours and shapes are important but some space should remain free to allow children invent their own activities. Adaptability will help in this regard, and will allow staff to successfully use the space. While safety and appropriate access need to be considered, young children require supervision and therefore easy visual and physical access to these spaces for supervising adults is important. Sleeping areas or facilities will also be required.

2.3.1d Pre-school (three to five years)

At this age children will usually have developed competent locomotive skills and can jump, pedal and hop. They have greater control over their fine motor skills and can cut with a scissors and thread beads. Socially and emotionally they begin seeking more independence and are keen to please. During the preschool years children's vocabulary and extensive comprehension continue to develop and they enjoy imaginative play.



Figure 7. Lux Childrens' Club, Moate, County Westmeath.

2.3.1e School-aged Children

While this review focuses on ELC settings and not primary schools, there are primary school design approaches and features that are relevant to ELC settings and these are reported on to inform the overall UD approach. School-age services can also be referred to as after-school or out-of-school care. Given the provision of school-age services can include children aged 4-14 years, special consideration needs to be given to designing a physical environment that supports the varying rates of development and growing needs of this older age group. Creating the right environment will support emerging independence, and in developing young people to their full potential. It will provide security and opportunities for relaxation, along with activities, interactions and ongoing development in an appropriately designed care environment. The positioning of the school-age service within a building is important. In certain circumstances an upper floor of the building will be considered suitable.

Primary school children need space that appeals to their intellect, sense of fun and need for physical and mental exploration. It is helpful to provide a number of seating options to facilitate various social and teaching arrangements and this should be reinforced through a management approach which allows children and staff to adapt to the space. Providing 'open ended' playground markings allow a diversity of uses and make sure there are opportunities for both formal (i.e. physical education, PE) and informal physical activities. Walsh (2006) points out that older children get hot and tired during play and recommends that water fountains and rest areas should be provided.

Outdoor areas should provide well-designed, comfortable social and eating spaces. Ideally some of these spaces should be covered and furnished with seating so as to provide high quality spaces that can also be used for teaching purposes. While it is important to provide larger spaces for traditional activities such as football, it is also worth considering other approaches such as activity trails which are large enough and provide sufficient challenge. The design of space must reflect the age of children; younger children may need the 'safety' of some level of containment, while older children coming into the setting as part of an after-school service may prefer an environment which is more adult-like.



Figure 8. Children of all abilities enjoying the outdoors, Graiguecullen Parish Childcare Centre, County Laois.

In the context of a UD ELC setting, the design of space for the age groups identified above should include provision for children with special educational needs or disabilities. However, given the complexity of these needs they are examined separately in a number of sections that follow. A setting will benefit from shared spaces that tie these individual areas together and provide common space for social interaction and mixing of age-groups. The DfES guidance referred to earlier points out that the relationship between various age-appropriate spaces is important in terms of integration and transition, and that a balance must be struck between the safety of all children and the avoidance of duplication of resources (DfES (UK), 2006). The creation of a child-friendly environment is not only about creating a safe and secure setting but also about providing them with the space and time to develop physically, socially, emotionally and intellectually. The following key issues must be considered:

Key considerations for the design of a UD ELC setting

- Consider UNICEF’s child-friendly schools framework which promotes “child-seeking, child-centred, gender-sensitive, inclusive, community-involved, environmentally-friendly, protective and healthy approaches to schooling and out-of-school education...”
- Consider how the spatial and physical nature of the surrounding community supports the ELC setting, provides access, and creates safe opportunities for physical activity (including walking or cycling to school), play and contact with nature.
- Use the UD ELC setting to create child-friendly environments to afford children space and time to play as an essential part of their physical, social and cognitive development.
- Provide age-appropriate spaces that respond to the needs of various age groups ensuring these spaces are safe while affording appropriate levels of challenge to support development.
- Ensure there are shared spaces to provide appropriate integration and transition between all age groups.

2.3.2 People with Cognitive, Learning, Behavioural, Communication and Interaction Difficulties

Referring back to the DCSF design guidance (2008), three of the four categories relate to non-physical disabilities and include:

- Cognition and learning,
- Behaviour,
- Emotional and social development,
- Communication and interaction.

The guidance details a number of design issues associated with each of the specific needs and are outlined below.

According to this design guidance, children with cognitive and learning difficulties may need practical sensory and physical experiences to support learning in relation to abstract ideas and concepts. These needs must be considered as part of school design and attention must be paid to good acoustics for speech and language support and storage for learning aids and other teaching resources. Good visibility to help with supervision and well-designed wayfinding to aid independence are also important issues.

To ensure the inclusion of children with behavioural, emotional and social development difficulties, disruptive, disturbing or hyperactive behaviour, or a tendency to be withdrawn or isolated the design issues relate to good sightlines which create a balance between privacy and supervision, secure storage and tamper proof services, low health and safety risks, and large spaces for social and outdoor activities.

For children with communication and interaction difficulties the design of a setting should provide a legible layout with clear signage that is easily comprehended while providing good lighting and acoustics. Information and Communication Technologies (ICT) may be required to provide additional sound or speech supports. Children with Autism Spectrum Differences (ASD) are often considered in this category and will benefit from the measures described above; however they may also require additional measures to ensure an inclusive education approach (Ring, Daly and Wall, 2018). The DCSF design guidance recommends a simple layout containing the following: “calm, ordered, low stimulus spaces, no confusing large spaces; indirect lighting, no glare, subdued colours; good acoustics, avoiding sudden/background noise”. Safe indoor and outdoor spaces for withdrawing and calming down are recommended along with precautions around health and safety and tamper proof services.

These ASD-specific design issues align with those highlighted elsewhere in literature which discuss an ASD-friendly design approach (McAllister and Maguire, 2012, Mostafa, 2008, Notbohm, 2005, Scott, 2009b). A recent publication ‘Aldo goes to Primary School: Experiencing School through the Lens of the Autistic Spectrum’, examines the experience of primary school from the perspective of a young boy with ASD. McNally et al (2013), illustrate the challenges faced by a person with ASD when attending school. The authors describe how people with autism may have difficulty comprehending verbal and non-verbal communication. They may be hypersensitive or hyposensitive (under-sensitive) to sensory information such as: sight, sound, touch, taste, smell, balance, or proprioception - relating to stimuli that are produced and perceived within an organism, especially those connected with the position and movement of the body (Oxford Dictionaries, 2014). These challenges can be experienced even more strongly by very young children (Ring, Daly and Wall 2018).

In terms of the spatial and physical design of the school environment, McNally et al (2013) argue that the following key issues are critical to providing an appropriate environment for children with ASD:

- **Arrival:** the noise and activity of a setting in the morning can be problematic so the transition from home should be as straightforward and stress free as possible. Ensuring parents can accompany a child as far as possible or providing a secondary entrance with less activity may help this transition.
- **Wayfinding:** circulation to and around the setting must be clear and comprehensible.

- **Legibility:** visual cues to help with orientation and identify the purpose of individual areas coupled with personalised spaces using colours or recognisable objects, and dedicated spaces for particular activities will help with overall legibility.
- **Scale and organisation:** smaller settings or those that are broken down into smaller 'neighbourhoods' will provide a more navigable and legible environment that allows easier orientation and is less daunting or disorientating.
- **Threshold:** any transition or change in environmental conditions can be problematic and so any space that allows a child to prepare and reorient themselves will be helpful.
- **Classroom:** a well-ordered and structured space which has identifiable areas for specific tasks or activities will help provide a secure and familiar space for a child with ASD.
- **Sensory issues:** certain environmental triggers can often upset or distract a child with ASD. It is important to:
 - avoid bright shiny surfaces, bold geometric patterns or strong textures as these can cause visual distraction.
 - reduce excessive sunlight and glare.
 - be careful with fluorescent lighting as the flicker from this lighting may be perceived by those who are hypersensitive.
 - use good acoustic design to mitigate excessive noise and avoid strong smells which can be problematic for people with ASD.
- **Engaging with others:** provide respite spaces in circulation areas, playgrounds or other social spaces from which the child can retreat but still maintain a view to activities to avoid being totally removed or isolated. The provision of secure dedicated play space for a particular class or age group may be helpful.
- **Quiet space:** greater retreat than outlined above may be beneficial and the provision of a quiet, calm and restful space which is acoustically separated from the activity area will help.
- **Safety and security:** children with ASD may attempt to 'escape' so security and supervision is important, especially when outside. They may often have a diminished sense of fear which can lead them to venture beyond safe boundaries and thus increase risk, particularly when sensory or co-ordination difficulties are also a factor.

The above issues are also major challenges in terms of ELC setting location, approach and adjacent spaces in the community. Hypersensitivity can cause many obvious problems for people in public spaces or streets where noise, crowds and bright lights are part of everyday life. Traffic lights, pedestrian stop lights, the sound of oncoming traffic, emergency sirens or public

announcements may be stressful and disorientating. On the other hand, people who are hyposensitive or, for instance, those who experience hypo-tactility (children who are hypo-tactile do not appear to feel pain or temperature) may fail to notice or understand tactile paving.

As discussed previously, the open and publicly accessible nature of an ELC setting will result in a wide spectrum of users. In some cases, for example family resource centres, this may include older people availing of further education or using the setting as part of the community. Grandparents often collect their grandchildren. So while the setting is primarily designed for young children, the users can cover a wide age spectrum. Issues around dementia may become a design factor to ensure that all people can use the setting equally.

Dementia friendly environments seek to support people with cognitive decline and other age-related difficulties. Fortunately, many of the ASD-friendly design issues explored above align with dementia-friendly requirements and this should be used to a designer's advantage when creating educational settings. Dementia-friendly environments have been described by Marshall (1998) who recommends that a dementia-friendly approach should include: distinct spaces for different functions; safe outdoor space; the use of personalisation; good signage with multiple cues such as sight, smell and sound; objects used for orientation; enhanced visual access; and, control of stimuli, especially noise. Burton and Mitchell (2006), propose a six key design principles to support dementia friendly streets which include: familiarity; legibility; distinctiveness; accessibility; comfort; and, safety.

Children with cognitive, learning, behavioural, communication and interaction, or other related difficulties present a huge variety of needs that vary greatly from person to person. However, heightened sensitivity to sensory information often plays a significant role in how they perceive and operate in an environment, which in turn greatly influences their comfort, wellbeing and ability to undertake tasks and participate in everyday activities. Taking into account the heterogeneous nature of people with cognitive, learning, behavioural, or communication and interaction difficulties, and acknowledging the diversity of their needs, the following key design issues should be considered in any UD educational environment:

Key considerations for the design of a UD ELC setting

- Create more human-scale environments by avoiding very large buildings or by breaking down larger settings into smaller parts that provide a more manageable, navigable and legible environment.
- Ensure that the layout is clear and comprehensible and the environment provides multiple sensory cues and good signage to help with legibility and wayfinding.
- Provide good sightlines to support this legibility and to allow child supervision.
- Consider alternative arrival routes for people who may be hypersensitive and have trouble dealing with typical activity associated with the start of the day.
- Carefully consider threshold spaces which introduce environmental change. Consider transition spaces that allow a person to prepare and reorient themselves.
- Provide respite spaces in circulation areas, playgrounds or other social spaces from which the child can retreat but still maintain a view to activities to avoid being totally removed or isolated.
- For a greater level of retreat provide quiet withdrawal spaces which are acoustically separated from the main activity.
- Provide calm, well ordered and structured external and internal spaces with identifiable areas for specific tasks or activities to help provide a secure and familiar space.
- Provide extra space for practical sensory and physical experiences to support learning in relation to abstract ideas and concepts. Provide space for additional learning aids.
- Pay attention to all sensory stimuli avoiding excessive noise, very strong odours, or visual stimuli such as glare, bright shiny surfaces, bold geometric patterns or strong textures.
- Carefully consider safety and security and provide tamper proof services, secure storage, and minimum health and safety risks.

2.4 People with Visual Difficulties

People with visual difficulties have a variety of different wayfinding techniques depending on the navigational aids they use and these are outlined by Atkin (2010). People with residual sight tend to rely on the limited sight they have, as well as sound and memory of the space they are using. For these users, tonal contrast between the pavement and carriageway is important; meaningless colour changes can be confusing and sudden level changes without indication via colour changes can cause trip hazards.



Figure 9. A person with visual difficulties may use a cane or a guide dog.

Long cane users rely heavily on tactile walking surface indicators, audible information from directional traffic movement, and audio pedestrian lights. They tend to use the building line as an orientational cue but will avoid the kerb line as they feel unsafe walking close to traffic. Wide open spaces without good navigational cues can cause disorientation. Level surfaces with no height differences between the path and carriageway can pose difficulties for long cane users as there is no way to detect movement from the path onto the road (Atkin, 2010).

In relation to navigational methods used by guide dog users, Atkin (2010) found they rely on a combination of on tactile paving, signals received from the dog and audible information such as traffic noises. Guide dogs are trained to orientate themselves using the kerb line and the building line. Guide dog users can use tactile paving to differentiate between the path and carriageway; however, if the tactile paving is missing for whatever reason, and the surfaces are level, a person with visual difficulties has no way of correcting the dog's mistake, and may be placed in a dangerous situation.

The DCSF design guidance (2008) outlines a range of design issues in relation to children with visual difficulties. These include:

- Good quality ambient and task lighting and controls,
- Visual contrast, cues, symbols, tactile trails and maps,
- Good acoustics, low background noise, speech and audio aids,
- Sounder alarms, health and safety warnings,
- VI (visual impairment) resource room,
- Storage and maintenance of technical aids.

The DCSF (2008) document refers to the need for mobility training (i.e. training that allows an individual to move safely and independently through the environment). This typically requires a dedicated mobility training room within the school. However, it is noted that mobility training can take place around the school and in external spaces on the school grounds that contain obstacles or various surfaces to negotiate. This will help the child to develop independence by providing safe simulations of many of the hazards a student may encounter outside the school.

While the design requirements in relation to people with visual difficulties will depend on the location and context of the setting, and the specific needs of the students, staff or members of the community, at a minimum the following key issues should be considered:

Key considerations for the design of a UD ELC setting

- Provide convenient, clearly defined legible travel routes with carefully located, well-designed signage for enhanced wayfinding.
- Provide circulation routes that support navigation through multiple sensory cues including visual (e.g. colour and tonal contrast or landmarks), smells (e.g. fragrant planting), or distinct sounds (e.g. chimes or moving water).
- Provide conveniently located private and sheltered vehicle or public transport drop-off points.
- Ensure good levels of natural and artificial lighting with even illumination especially along circulation routes.
- Use tactile paving surfaces to indicate hazards, level changes or steps and generally aid navigation.
- Ensure circulation routes are sufficiently wide to cater for a person using a long cane, somebody with a guide dog, or a teacher or parent walking beside a child with visual difficulties.
- Consider how the school and ELC setting can be used for mobility training using various kinds of mobility aids or a guide dog.
- Consider what ICT solutions may be beneficial to people with visual difficulties in terms of wayfinding and how these might be included or influence the design of the setting.

2.4.1 People with Mobility Difficulties Including Wheelchair Users

Research shows that people with mobility difficulties are supported by environments that are free of clutter, contain even surfaces and have limited crossfall, which is a feature of pavement surfaces designed to support drainage, (Department for Transport UK, 2011b). Those with limited mobility, arthritis sufferers, and cane or rollator users, need plenty of well-placed seating to afford resting points. The United Kingdom based Manual for Streets (Department for Transport UK, 2007) suggests seating should be provided at 100 metre intervals along key pedestrian routes and be located where there is good natural surveillance. The UK Inclusive Mobility (Department for Transport UK, 2005) guidance refers to recommended walking distances for people with various mobility difficulties and points out that while a typical wheelchair user may need to rest approximately every 150m, a person with mobility difficulties and who uses a stick would need to rest every 50m.

Regarding mobility issues specific to the educational setting, the DCSF design guidance (2008) recommends the following: higher accessibility standards; greater space for carers and bulky mobility equipment and greater storage area; shallow pitch stairs; rest places; greater health and safety awareness along with provisions for assisted emergency escape.



Figure 10. A child using a rollator on an outdoor path, Graiguecullen Parish Childcare Centre, Graiguecullen, County Laois.

In terms of the overall ELC setting circulation it is important to provide short, conveniently located, level, clutter-free circulation routes that are accessible and usable by those with mobility difficulties. For many people with mobility difficulties vehicles provide an important form of transportation, therefore the setting must ensure these users can access and circulate to key points within the site such as building entrances. Conveniently located parking spaces, set down areas or dropping-off spaces with shelter must be provided for those with a restricted travel range such as people with mobility or sensory difficulties (DfCSF (UK), 2008).

People with mobility difficulties will have specific requirements for outdoor space including: play areas with sufficient space for specialised play equipment; outdoor PE facilities such as all-weather pitches for ease of movement (drainage can be an issue in all-weather pitches); covered outdoor space providing a transition between indoor and outdoor spaces; garden areas with raised beds for wheelchair users or those with restricted mobility. While the integration of children with mobility difficulties is essential, it may be beneficial to provide some dedicated spaces to protect vulnerable children from the boisterous play that occurs naturally. Dedicated trails or routes can provide protection while supporting mobility training where safe simulations of everyday hazards can be introduced as part of the learning process.

Key considerations for the design of a UD ELC setting

- Provide vehicle access, circulation, parking or set-down and drop-off areas to suit people with a limited travel range.
- Provide short, level, slip resistant, and clutter free circulation routes in convenient locations.
- Ensure circulation routes are sufficiently wide to cater for a person using mobility equipment or being assisted by another individual.
- Provide seating, respite areas, and sheltered seating or social areas in key external spaces and along circulation routes.
- Provide adequate external space and storage for bulky mobility equipment.
- Consider how the school and ELC setting can be used for mobility training where everyday hazards can be introduced in a safe environment.
- Provide protected play or circulation areas for more vulnerable children while also considering integration and transition from protected spaces to shared spaces.

2.4.2 People with Hearing Difficulties

In terms of the external environment, people with hearing difficulties may have associated balance issues and therefore surfaces with appropriate crossfall will provide greater ease and comfort when walking (Department for Transport UK, 2011a). During field studies for research undertaken by Grey et al. (Grey et al., 2012) participants with hearing difficulties, who also represented the Irish Deaf Society, spoke about the need for wider footpaths to allow two people to walk comfortably side-by-side to facilitate lip-reading or communication through sign language. The issue regarding the inability to hear oncoming traffic or emergency vehicles which were out of direct view or approaching from behind also arose. This was highlighted as an issue for individuals needing to cross a street in moving traffic or navigate through a space where there is a certain mix of motorists and pedestrians. These issues need to be carefully considered with regard to approaching, entering and circulating within ELC settings.

Referring to educational design issues specific to those with hearing difficulties, the DfCSF design guidance (2008) focuses on how to minimise distraction and support diminished hearing by providing high quality acoustics and reducing background noise. To support text or lip-reading they recommend using subdued colours, high quality low glare lighting, and the avoidance of shadows causing silhouetting. In terms of technology the guidance proposes “visual alarms, sound-field systems, hearing loops; storage & maintenance of technical aids” (p.199).

Key considerations for the design of a UD ELC setting

- Ensure circulation routes are wide enough to allow at least two people to walk comfortably side-by-side to facilitate lip reading or communication through sign language.
- Ensure acoustic conditions are optimised for people with hearing difficulties especially in noisy environments such as playgrounds or areas with potential traffic hazards.
- Consider what ICT solutions may be beneficial for people with hearing difficulties and how these might be included or influence the design of the ELC setting.

2.4.3 An Older Person

Considering the family-centred ethos of the Diversity, Equality and Inclusion Charter and Guidelines for Early Childhood Care and Education (DCYA, 2016), it is important to acknowledge the key role grandparents and older relatives can play in the care of children attending an ELC setting. Sometimes they will be the person dropping off and picking up the child, and therefore their needs, in terms of accessing and using the setting must be taken into account. In general, the quality of the built environment has been shown to contribute to older people's health through opportunities to be active and through the provision of spaces where people can socialise (Sugiyama and Ward Thompson, 2007). However many of these activities require a certain level of physical strength and fitness and often the built environment presents barriers that older people find difficult to negotiate (Sugiyama and Ward Thompson, 2005) due to age related biological changes such as mobility, visual or hearing difficulties.



Figure 11. Grandparents are important stakeholders in a ELC setting.

Research carried out by the Inclusive Design for Getting Outdoors (I'DGO) research consortium examined the many issues that affect older people in the built environment and they have published a set of findings and guidelines (I'DGO, 2010). This research involved focus groups, interviews and onsite audits and found a number of common preferences and concerns for older people. Most of the respondents preferred wide, uncluttered footpaths with minimum temporary obstacles and for the parking of cars on footpaths to be discouraged. The research also found the respondents favoured traditional kerbs, and where required, dropped kerbs to clearly differentiate the carriageway

from the footpath. However, many found the presence of tactile paving at the dropped kerb uncomfortable and some reported that they felt they could twist their ankle. Tactile Work Surface Indicators (TWSIs) such as tactile paving can, however, provide valuable mobility assistance and enhanced accessibility. In relation to pedestrian crossings, most felt a signal-controlled crossing suited them best, while the least favoured was informal or uncontrolled crossings. Most of the older people interviewed welcomed the presence of seating as rest points at appropriate distances but would also use informal objects such as low walls or seating in bus shelters to rest.

As dementia is more prevalent among older people, the design of a dementia friendly environment will obviously be beneficial for many older people. A range of dementia friendly design issues have been discussed earlier and it was pointed out how these measures are in many ways closely aligned with an autism-friendly approach. In fact many of these measures, such as enhanced legibility, or the use of multiple sensory cues for orientation and wayfinding, are also beneficial for other users such as those with visual or hearing difficulties.

An ELC setting will need to provide a supportive environment for older people in terms of age-related mobility, visual and hearing difficulties, or cognitive difficulties caused by dementia. It is equally important to provide an environment that supports positive intergenerational interaction. At a minimum the design of a UD ELC setting that successfully caters to older people in an intergenerational context should consider the following:

Key considerations for the design of a UD ELC setting

- Provide vehicle access, circulation, parking or set-down and drop-off areas to suit older people with a limited travel range.
- Provide short, level, slip-resistant, and clutter free circulation routes in convenient locations.
- Provide convenient, clearly defined and legible travel routes supplied with carefully located and well-designed signage for enhanced wayfinding.
- Provide circulation routes that support navigation through multiple sensory cues including visual (e.g. colour and tonal contrast or landmarks), smells (e.g. fragrant planting), or distinct sounds (e.g. chimes or moving water).
- Ensure good acoustic conditions particularly in areas adjacent to noisy activities such as playgrounds or main circulation routes.
- Consider what ICT solutions may be beneficial for people with visual or hearing difficulties and how these might be included or influence the design of the ELC setting.

Strange et al (2001) propose that educational environments greatly influence educational outcomes and argue “that educational settings designed with an understanding of the dynamics and impact of human environments in mind will go further in achieving these ends.” UD engages with these dynamics and impacts and has the potential to create the supportive educational environments as discussed by Dewey and Strange. To understand the role of UD in creating inclusive ELC settings, it is important to examine the various design goals, principles, guidelines and processes which are encompassed by UD. The following sections examine these and this chapter concludes with a brief discussion about the role UD has in supporting inclusive ELC settings in Ireland.

2.5 Universal Design Goals and Principles

Steinfeld and Maisel (2012) outline a set of UD goals that relate to human performance, health/wellness and social participation and are composed of the following:

- 1 Body fit - accommodating a wide a range of body sizes and abilities.
- 2 Comfort - keeping demands within desirable limits of strength and stamina.
- 3 Awareness – ensuring that critical information for use is easily perceived.
- 4 Understanding – making methods of operation and use intuitive, clear and unambiguous.
- 5 Wellness – contributing to health promotion, avoidance of disease and prevention of injury.
- 6 Social integration – treating all groups with dignity and respect.
- 7 Personalisation – incorporating opportunities for choice and the expression of individual preferences.
- 8 Cultural appropriateness – respecting and reinforcing positive cultural values and local context.

Steinfeld and Maisel developed the above goals to add clarity of purpose to the internationally established UD principles (Kose et al., 2001, Preiser and Smith, 2011) which are as follows:

- 1 Equitable use – the design is useful and marketable to people with diverse abilities.
- 2 Flexibility in use – the design accommodates a wide range of individual preferences and abilities.
- 3 Simple and intuitive – the design is easy to understand regardless of the user’s knowledge, language skills or current concentration levels.

- 4 Perceptible Information – the design communicates necessary information effectively to the user, regardless of ambient conditions of the user’s sensory abilities.
- 5 Tolerance for error - the design minimizes hazards and the adverse consequences of accidental or unintended actions.
- 6 Low physical effort – the design can be used efficiently and comfortably with minimum fatigue.
- 7 Size and space for approach and use - design provides appropriate size and space for reach and manipulation, regardless of user’s body size posture or mobility.

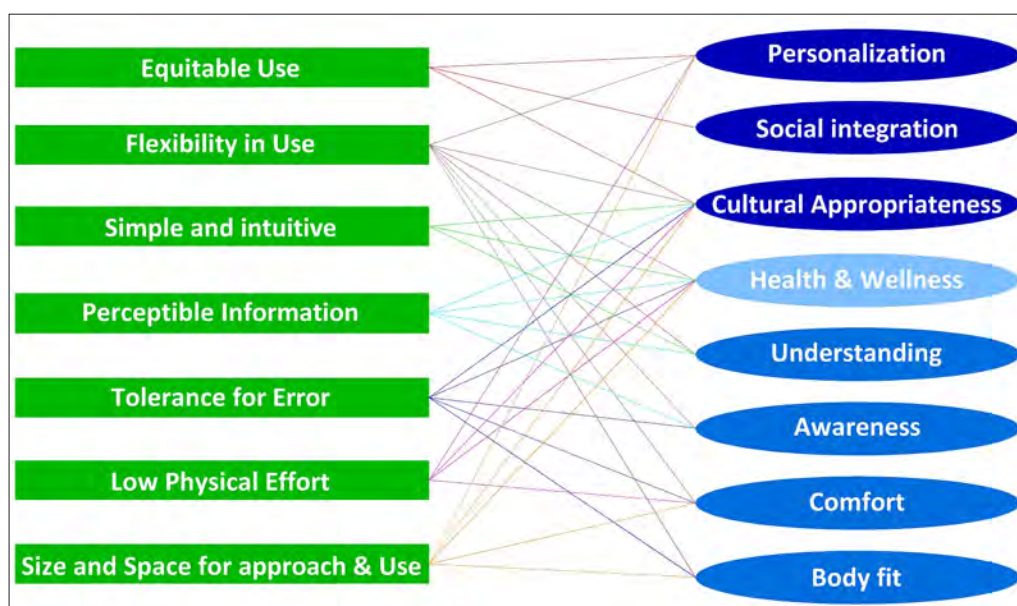


Figure 12. Relationship between Universal Design Principles and Universal Design Guidelines (adapted from Steinfeld and Maisel, 2012)

Lissner looks at the seven UD principles in relation to educational settings and for each principle he offers a description and an exemplar. The intention is to provide an outline of how typical design issues experienced in an educational setting could be resolved within the framework of the seven UD principles (Lissner, 2007).

Table 1. The Seven Principles of Universal Design for the Built and Learning Environments (Lissner 2007)

Equitable use: welcoming to diverse groups; provides for equivalent if not identical participation and effort. Consider characteristics such as height, weight, strength, vision, hearing, gender and cultural/background, experiences of all potential users.

Exemplars: entrances at grade, captioned media, accessible web design for voice output.

Flexibility in use: adaptability of the overall spaces over time (sustainability) as well as flexibility and control by the users in interacting with specific elements and functions.

Exemplars: typical gendered group restrooms vs. individual/family restrooms, alternative methods of demonstrating learning, cascading style sheets in web design.

Simple and intuitive use: welcoming to non-native English speakers and individuals from diverse backgrounds; provides consistent forms, locations, and cues for way finding, operation, or interaction.

Exemplars: building or directional signage that includes local area maps or floor plans, course management system instructions that consider the range of experience with the technology by participating students and faculty.

Perceptible Information: communicate information effectively across the spectrum of ambient conditions (light, sound, activity) using a variety of modalities (tactile, visual, auditory, linguistic).

Exemplars: light strobe and auditory output on alarms, pictograms on signage, volume, spacing, and size of text on PowerPoint slides.

Tolerance for error: minimise hazards and the adverse consequences of unintended actions, variations in pace, or vigilance; provide warnings or fail safe features.

Exemplars: changes in texture and colour at elevation changes, the “undo” option in computer software, opportunities for feedback prior to grading.

Low physical effort: efficient building systems; minimize user fatigue by reducing the need for sustained physical effort, allowing for neutral or ergonomic body positioning and reasonable operating forces.

Exemplars: sustainable and green building technologies, walking distances from transportation points, maintaining low slopes on ramps and paths of travel, articulating keyboard trays in computer labs, seating options in classrooms.

Size and space for approach and use: appropriate space for approach and reach across user heights, sizes, and relative position; appropriately sized elements to allow manipulation across a range of hand sizes and reach ranges.

Exemplars: mounting heights that are comfortable for children, adults, or wheelchair riders, adequate space at computer workstations (aisles, table surface, and knee clearance), adequate space to respond to test questions.

2.6 Conclusion

This chapter sought to outline the key components of a UD approach and how this relates to the design of the ELC setting. As stated previously, UD is not only about removing barriers, but about creating positive environments to maximise inclusion and the empowerment of all people. If an ELC setting is to be an inclusive environment it must be accessible, easily understood, and usable to the greatest extent by all users regardless of age, size, ability and disability.

Key issues arising from Chapter 2

UD supporting inclusive education
Through its holistic and integrated human-centred design approach for all people regardless of age, size, ability or disability, UD supports the goals of inclusive education, which take a holistic view of the learner, promotes participation and embraces diversity.
The emphasis on activity and participation in UD, expressed through the ‘Person-Activity-Environment’ (PAE) interaction, helps to highlight how human activities, participation and performance are either restricted or enhanced by the environment. This PAE interaction is therefore crucial in an inclusive education setting.
UD supporting inclusive education
The UD ELC setting must cater to a diverse range of children, staff and community needs and preferences. Children across early years, primary, post primary and further education will present a wide variety of age and ability related needs. Older people, or members of the local community, will also have specific needs based age related biological changes such as mobility difficulties, visual or hearing difficulties, or cognitive difficulties such as dementia.
As part of the above, the varying and specific design requirements associated with special educational needs and disabilities must include: children with cognitive and learning difficulties; children with behaviour, emotional and social development difficulties; children with communication and interaction difficulties (including those on the Autistic Spectrum); and those with visual, mobility, or hearing difficulties.
This chapter has examined a range of design approaches and features that cater to the multiple needs of users outlined above. The UD approach must be used to balance the design response in order facilitate all users equally and create an inclusive ELC setting environment for all.

3 Key Pedagogical and Care Issues for Early Years Settings



Figure 13. Asilo Nido La Chiocciola, San Miniato, Italy.

This part of the review focused on reviewing literature relevant to Early Learning and Care (ELC), to include key pedagogical and care issues. The findings of this literature review were used to provide an evidence base which underpins the **Universal Design Guidelines for Early Learning and Care settings**. Both peer-reviewed and grey literature were examined in order to identify national and international best practice regarding Universal Design (UD) and the built environment in ELC settings.

The core quality standards for ELC settings outlined in Síolta, the National Quality Framework for Early Childhood Education (CECDE, 2006), provided an appropriate structure and context to guide this literature review. The literature review acknowledges that the Síolta Principles and Standards of Quality are closely aligned with those of Aistear: The Early Childhood Curriculum Framework (NCCA, 2009,) as articulated in the Curriculum Foundations section of the Aistear Síolta Practice Guide (NCCA, 2015). The Literature Review is presented with reference to:

- Rationale
- Literature review methodology
- The Rights of the Child
- The Child and Parents and Families
- The Child and Interactions
- The Child and Play
- The Child and Professional Practice
- The Child and Community Involvement
- Limitations and Conclusion

3.1 Rationale

The Síolta principles of quality embody the vision, which informs and provides a context for quality practice in early childhood education and care (ECEC) in Ireland (CECDE, 2006). Síolta, in the first of its twelve principles affirming the value of Early Childhood, states that “early childhood is a significant and distinct time in life that must be nurtured, respected, valued and supported in its own right” (CECDE 2006:6). Other key principles include Children First; Parents; Relationships; Equality; Diversity; Environments; Child Welfare; the Role of the Adult; Teamwork; Pedagogy and Play. The principles of quality underpin the standards and components of quality, which further elaborate on, and define quality practice. The breadth of the sixteen Síolta standards is very wide, incorporating the Rights of the Child; Environments; Parents and Families; Consultation; Interactions; Play; Curriculum; Planning and Evaluation; Health and Welfare; Organisation; Professional Practice; Communication; Transitions; Identity and Belonging; Legislation and Regulation and Community Involvement (CECDE, 2006).

Following extensive discussion with both the partners and Steering Committee, for the purposes of the development of the **Universal Design Guidelines for Early Learning and Care settings**, we focused on six of the sixteen standards, which the combined experience and expertise of the group consider have particular resonance for UD in the context of ELC settings. These are Standard One: The Rights of the Child; Standard Three: Parents and Families; Standard Five: Interactions; Standard Six: Play; Standard Eleven: Professional Practice and Standard Sixteen: Community Involvement (CECDE, 2006). Given that the Universal Design Guidelines relate completely to ELC environments, clearly Standard Two: Environments is inextricably linked also. These principles are summarised at Figure 14.

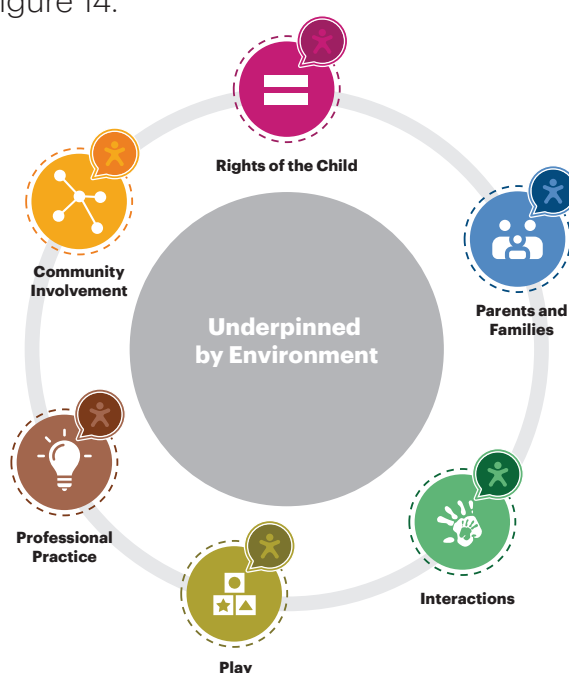


Figure 14. Síolta Standards Guiding the Literature Review

The standards of quality in Figure 6 are further reflected in the Proposal for Key Principles of a Quality Framework for Early Childhood Education and Care (Working Group on Early Childhood Education and Care under the auspices of the European Commission, 2014). The framework identifies three transversal issues, which it considers are fundamental to the development and maintenance of high quality ELC:

- A clear image and voice of the child and childhood should be valued
- Parents are the most important partners and their partnership is essential
- A shared understanding of quality

Together with these three transversal issues the principles promoting participation, strengthening social inclusion, embracing diversity, providing supportive working conditions including professional leadership and providing a curriculum focused on enabling children's holistic development further resonate with the Síolta standards guiding the literature review (CECDE, 2006). Aistear: the Early Childhood Curriculum Framework similarly articulates twelve principles, presented in three groups (NCCA, 2009). These twelve principles intersect with Síolta and the European Framework in the areas of environments, play, equality and diversity and parents, family and community (CECDE, 2006; Working Group on Early Childhood Education and Care under the auspices of the European Commission, 2014).

3.2 Literature Review Methodology

A rigorous systematic approach to reviewing the literature was adopted in order to ensure it provided a synthesis of empirically-based literature and situated the project in a rich and embedded contextual framework to inform the project outcome (Bond et al. 2013; Gough 2007). An iterative approach to reviewing the literature was adopted, which continued to invigorate the process for the duration of the project.

A two-strand approach was implemented, which included an empirical strand and an expert strand. The empirical strand comprised a systematic search of electronic databases and web searches related to peer-reviewed studies and the expert strand focused on accessing articles, reports, reviews and guidance based on expert opinion/professional experience related to ELC.

The literature review focused on identifying peer-reviewed publications published in English between 2008 and 2018, which were primary studies or reports of practice in early childhood education, relevant to the six Síolta (CECDE, 2006) standards guiding the literature review (See Figure 14. above). A computer-based search, included searches of the following electronic databases: PsycINFO; Science Direct; Scopus; ERIC and ProQuest. In addition web searches were undertaken using Google Scholar, Education-line and OECD Education at a Glance. Where during searches, literature pre-2008 emerged and was deemed to be significant in the context of the project, this literature was reviewed.

3.2.2 Expert Strand

The literature review focused on identifying and accessing articles, reports, reviews and guidance based on expert opinion/professional experience published in English between 2008 and 2018, which were relevant to the six Síolta standards guiding the literature review (See Figure 13 above) (CECDE 2006). Web searches were undertaken using Google, Google Scholar, Education-line and OECD Education at a Glance. As with the empirical strand, where literature pre-2008 emerged during searches and was deemed to be significant in the context of the project, this literature was reviewed.

3.2.3 Literature Searching

Prior to commencing the literature search, search terms were developed to locate the documents relevant to both the empirical and expert strand. In relation to early learning and care, both in Ireland and internationally, a range of terminology is used interchangeably. Applying Boolean Operators [AND/OR/NOT], all of the search terms in Table 3. were used to locate the literature.

Table 2. Search terms for the literature review

Early years settings
Early childhood settings
Early childhood care and education settings
Early childhood education and care settings
Pre-school settings
Pre-primary provision
Crèche
Childcare settings

The exclusion criteria identified in Table 3 were applied to both the empirical and the expert Strands, with reference to the scope, study-type and time and place.

Table 3. Exclusion Criteria

Scope	EC1	Not focused on early childhood education
	EC2	Not related to the selected Síolta standards
Study Type	EC3	Literature in empirical strand not empirically grounded
Time and Place	EC5	Literature from empirical strand and expert strand not within the specified time-frame (2008-2018)
		Not written in English

3.3 Synthesis of the Literature

The data extracted was initially organised as findings into categories, secondly the findings were analysed within each of these categories, and finally the findings were synthesised across the literature reviewed. The literature reviewed specifically focused on Síolta Standard One: The Rights of the Child; Standard Three: Parents and Families; Standard Five: Interactions; Standard Six: Play; Standard Eleven: Professional Practice and Standard Sixteen: Community Involvement (CECDE 2006).

3.3.1 Standard One: The Rights of the Child

Ensuring that each child's rights are met requires that she/he is enabled to exercise choice and to use initiative as an active participant and partner in his/her own development and learning.

3.3.1a Children's Rights and Our Responsibilities

Children's rights are recognised in both national and international law, underpin government policy frameworks, are increasingly acknowledged in research and promoted in the context of initial early childhood teacher education (Ireland 2012; United Nations Convention on the Rights of the Child, (UNCRC) 1989; Department of Children and Youth Affairs (DCYA) 2014; Daly and Ring et al. 2016; Ring and Mhic Mhathúna et al. 2016; Ring, O'Sullivan and Wall 2018).

The UNCRC was ratified by Ireland in 1992. However, while the rights of the child are articulated as key principles in policy and practice contexts globally, ensuring these rights are vindicated continues to present as a contested space (Ring and O'Sullivan, 2016). Specifically the rights of children with additional needs have long been neglected in both national and international human rights law (O'Mahoney 2006; Sabatello 2013). While the UNCRC explicitly included children with additional needs within its scope, discrimination and exclusion from participation in education, social and cultural contexts has continued to remain a feature of children's and families' experiences (Sabatello 2013).

The UN Convention on the Rights of Persons with Disability (UNCRPD), adopted by the UN General Assembly in 2006 and ratified by Ireland in March 2018, represents a further step in mitigating this neglect. However, the degree to which international conventions are incorporated into domestic law is recognised as central to the implementation of international conventions and the associated vindication of the rights and freedoms associated with their scope (Lundy et al. 2013). While international policies and monitoring contribute to the realisation of children's rights, the degree to which these rights are mirrored in national policies and provision remains the key determinant of whether these rights become a reality for children.

The inclusion of children's voice and participation as a national goal in the National Children's Strategy 2000-2010 demonstrates the potential impact of national plans on children's rights awareness and implementation. However, Lundy et al. (2013) caution that the role of a range of stakeholders, including UNICEF; national human rights' organisations; non-governmental organisations; academics and the media, in documenting progress and auditing compliance is critical in sustaining progress towards full implementation. The UNCRC remains the most ratified international human rights treaty, ratified by all State Parties with the exception of the United States. With ratification comes a duty to implement the articles of the CRC. The four general principles summarised in Figure 15. underpin the Convention.

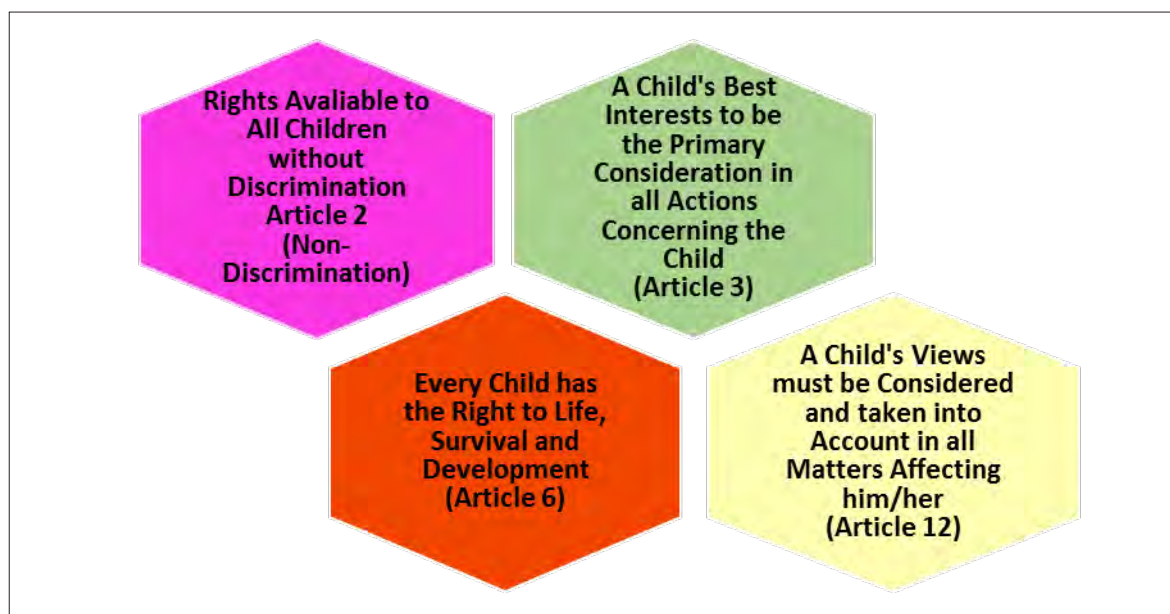


Figure 15. The Four General Principles Underpinning the UNCRC.

The UNCRC adopts a holistic approach to the rights of children and brings economic, social, cultural, civil and political rights together in an integrated manner that reflects the full and harmonious development of the child's personality and inherent dignity (Children's Rights Alliance (CRA) 2010). The rights articulated in the UNCRC are not viewed as hierarchical but rather are designed to 'interact with each other to form dynamic parts of an integrated unit' (CRA 2010, 2). The principles articulated in Figure 14. underpin the development of the **Universal Design Guidelines for Early Learning and Care settings**, in terms of acknowledging children's rights to an ELC environment that reflects these principles. Because ensuring participation of all children in high quality early years' experiences is critical, specific emphasis is placed on Article 12 in the context of this project.

Article 12.1 of the United Nations Convention on the Rights of the Child states that:

State Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child (UN 1989: Article 12.1).

However, in accordance with the integration principle of the Convention, the participation rights in the CRC are also reflected across the Convention and particularly in Article 13 (Freedom of Expression); Article 14 (Freedom of Thought, Conscience and Religion); Article 15 (Freedom of Association and Peaceful Assembly) and Article 17 (Access to Information). These rights are summarised in Table 4.

Table 4. Articles in the UNCRC Reflecting the Participation Rights Articulated in Article 12 (Adapted from UN 1989)

Article 13 Freedom of Expression	13.1 The child shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of the child's choice.
Article 14 Freedom of Thought, Conscience and Religion	14.1 State Parties shall respect the right of the child to freedom of thought, conscience and religion. 14.2 State Parties shall respect the rights and duties of parents and, where applicable, legal guardians, to provide direction to the child in the exercise of his or her right in a manner consistent with the evolving capacities of the child.
Article 15 Freedom of Association and Peaceful Assembly	15.1 State Parties recognize the rights of the child to freedom of association and to freedom of peaceful assembly.
Article 17 – Access to Appropriate Information	State Parties shall ensure that the child has access to information and material from a diversity of national and international sources, especially those aimed at the promotion of his or her social, spiritual and moral well-being and physical and mental health.

In the context of ensuring that children’s rights are central to the Universal Design Guidelines for Early Learning and Care settings, a focus is maintained on considering the implications for Universal Design in terms of providing for children’s participation with reference to the principles articulated in both Figure 14 and Table 4 in association with the range of related Irish policy and curriculum documents and the provisions of the UNCRPD (Ireland 2000; CECDE 2006; UN 2006; NCCA 2009; DCYA 2014, 2015; NCCA 2015; DCYA, 2016). Specifically the Lundy Model of Participation adopted by the DCYA in the National Strategy on Children and Young People’s Participation in Decision-Making (2015-2020) is useful in reflecting on how children’s participation is conceptualised and operationalised in ELC settings.

The model in Figure 16. suggests that children should be given space through the provision of safe and inclusive opportunities to both form and express their views; allocated a voice through being facilitated in expressing their views; ensure children’s voices are listened to by an audience and their views responded to in order that they understand that their views have influence.



Figure 16. The Lundy Model of Participation (DCYA 2015: 21)

Children’s rights and our responsibilities in considering Universal Design principles in ELC settings will be explored under the themes, which emerged from the synthesis of the literature: A Pedagogy of Voice and Freedom of Expression, Thought and Association.

3.3.1b A Pedagogy of Voice

Pedagogy can be described as how we teach, underpinned by the theories about how children learn and develop and our own beliefs and values about education (Jones and Shelton 2011). Our construct of children and on childhood is inextricably linked to the pedagogy we espouse. Influenced by the Italian Reggio Emilia approach, the image of the agentic child has emerged (Sorin, 2005). Childhood is recognised as a time of ‘being’ rather than ‘becoming’ when children adopt an active role in understanding their world through interaction with it (Ring and O’Sullivan, 2018). The adult’s role is concerned with guiding the learning process in collaboration with the child through the co-construction of knowledge (Sorin, 2005). ELC is concerned with the development of competent learners with high levels of motivation who are supported in applying their existing knowledge in new situations, to plan, monitor and evaluate their performance and demonstrate flexibility in strategy selection (Ring and O’Sullivan, 2018). The concept of the child as a citizen with rights and responsibilities, opinions worth listening to and a right to be involved in decisions affecting them is identified as one of the principles of Aistear: The Early Childhood Curriculum Framework (NCCA, 2009). The agentic child is therefore a protagonist in a democratic early years’ system, which includes, listens to, and responds to all voices equally (Dewey 1916).

While including the voice of the child is articulated as a key principle of early years’ pedagogy, ensuring that a pedagogy of voice is central to the child’s experience in the early years continues to challenge education systems (Ring and O’Sullivan, 2016). Deegan poses the question as to whether we are truly convinced about the value of adopting a pedagogy of voice and critically, a pedagogy of listening. Landsdown (2005) observes that prioritising children’s participation impacts positively on children’s self-esteem and confidence; promotes their overall development; develops children’s sense of social competence, autonomy, independence and resilience. Subscribing to the principles of democracy in early learning and care places an intrinsic value on listening and responding to children’s voices, irrespective of a child’s age or ability (Rinaldi, 2012).

Gandini (2012) identifies a discernible connectedness between pedagogy and the architecture of the ELC setting, observing that on visiting a setting, the visitor reads the messages the space communicates between the quality of care and the educational choices that form the basis of the children’s experiences. The inclusion of children’s voices and how they are responded to is instantaneously evident in the spaces allocated to children’s creations; activities; expressions and photographs. Children’s sense of ownership and belonging is at once evident in the architecture and acoustic nature of the setting.

3.3.1c Freedom of Expression, Thought and Association

Creating an environment consonant with Article 3.1 of the UNCRC is central to securing children's right to express themselves freely, including freedom to seek, receive and impart information and ideas of all kinds, either orally, in writing or in print, in the form of art, or through any other media of the child's choice (UN, 1989). In accordance with Article 14.1 and 15.1, in this environment, the child has the right to freedom of thought, conscience and religion and the right to freedom of association. Embedding the child's access to information and material from a diversity of national and international sources, including those aimed at promoting the child's social, spiritual, moral well-being, physical and mental health in this context provides for the realisation of Article 17. of the UNCRC (UN, 1989).

Communicating is one of the four themes of Aistear: The Early Childhood Curriculum Framework and is concerned with children being provided with enriched opportunities to share their experiences, thoughts, ideas and feelings with others in a variety of ways and for a variety of purposes (NCCA, 2009; 2015). Edwards et al. (2012) refer to the hundred languages of children and highlight the importance of children's myriad of communication modes being responded to. Children communicate in diverse ways such as through facial expressions; gestures; body movements; sounds; art; music; dance; drama; photographs; symbols; assistive technology; signing, Braille and story (NCCA, 2009). The role of the adult is central to creating an environment where freedom of expression is promoted and which:

“....motivates children to interact with each other and the adult, and with the objects and places in it. By capturing children's interests and curiosity and challenging them to explore and to share their adventures and discoveries with others, this environment can fuel their thinking, imagination and creativity, thereby enriching communication” (NCCA, 2009: 34).

Jarman (2013) observes that developing children's communication skills does not take place in isolation and emphasises the importance of providing a context within which to support children in assimilating and practising their new knowledge and skills. Jarman suggests adopting a Communication Friendly Spaces ApproachTM (CFSTM), which takes a holistic perspective of the learning environment and focuses on the three areas of the physical environment; resources and the adult role, working in harmony together, with no one area on its own being sufficient. See Figure 17. below adapted from Jarman (2013).

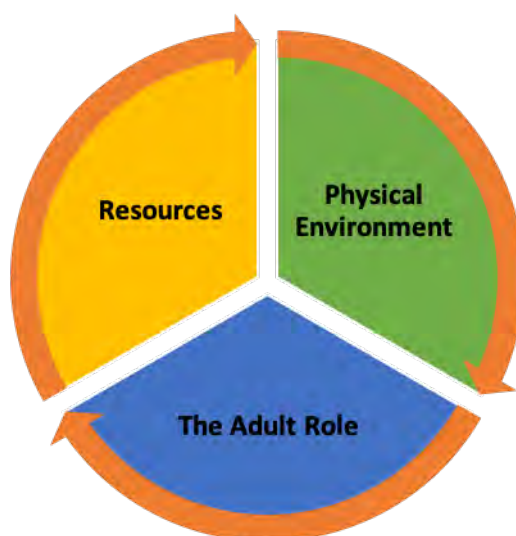


Figure 17. A Communication Friendly Spaces Approach™ adopted from Jarman (2013: 10)

The creation of a CFC™ provides a structure within which to provide for the child's right to freedom of expression, thought and association. Jarman (2013) advises that attention should be directed towards the scale, quality, developmental appropriateness and purpose of resources. Gandini (2012) highlights the role of the physical environment in communicating to children and suggests that the structures, choices of materials and stimulating manner in which educators construct environments should be focused on creating an open invitation for children to explore and communicate, both individually and with each other. Gandini advises that encouraging physical conditions, the use of natural light and uncluttered spaces positively support and encourage children's development. As noted by Gandini (2012), young children's development is enhanced and optimised through sensorial explorations and the opportunity for children to construct their knowledge and memory through them. An environment which utilises colour, light, sound and smell and provides a rich and varied selection of materials with multi-sensory surfaces and features based on the observed preferences of individual children and commensurate with their developmental levels, supports children's right to expression through encouraging them to seek, receive and impart information and ideas in motivational contexts (Zini, 2005).

The organisation and use of materials in the ELC setting impacts significantly on children's experiences and are shaped by distinctive cultural, political, historical and social influences (Prochner et al., 2008). The importance of creating an inclusive physical environment is highlighted in the Diversity, Equality and Inclusion Charter and Guidelines for Early Childhood Care and Education (DCYA, 2016). While it is stressed that the interaction and discussion with the materials in the physical environment promote children's understanding of difference, the

guidelines highlight that the provision of a rich, diverse physical environment has an important role in promoting inclusion and supporting children in accommodating differences (DCYA, 2016).

Creating an environment, which fosters freedom of expression, thought and association and includes access to appropriate information is therefore both a possibility and a key responsibility for ELC settings.

3.3.2 Standard Three: The Child and Parents and Families

Valuing and involving parents and families requires a proactive partnership approach evidenced by a range of clearly stated, accessible and implemented processes, policies and procedures.

Interactions with parents and families is another important indicator of process quality in ELC as parental engagement in children's early learning and care is associated with a range of positive socio-emotional and academic outcomes (Whitebread, Kuvalja and O' Connor, 2015). Strong setting-parent relationships provide children with continuity of experience between home and the ELC setting. When parents and families are involved in their children's setting, children's learning and development is promoted in an integrated and holistic way. Research undertaken in the UK by The Office for Standards in Education, Children's Services and Skills (Ofsted) (2015), found that the most effective ELC settings worked as much with parents as with children which was found to be particularly beneficial in terms of supporting more vulnerable children and families.

Parents often see educational settings as the context in which learning takes place. This is ironic given that early learning is best nurtured through the type of informal and meaningful experiences which abound in the home environment (Whitebread, 2015). Engaging with parents and families also allows the ELC setting to surface each child's unique cultural capital, upon which all new learning is built (Brooker, 2010; Whalley, 2017). Good communication with parents and families supports parental understanding of the curriculum - what the setting goals are for children's learning and development and the principles and methodologies the setting uses to support children developing as competent and confident learners (NCCA, 2009). This is important, as parental views in relation to the content and processes of early learning are often not well aligned with those of the ELC setting (Brooker, 2010; Moyles, 2012). As parental awareness around what and how children are learning increases, so too does the likelihood that parents will further support children's learning journey in the home environment through promoting talking, reading and playing (OECD, 2012; Whitebread, 2016; Fisher, 2018).

As parental working patterns continue to change, children are spending more time in ELC settings which further emphasises the salience of effective relationships with parents and families (OECD, 2012). Greenman (2007) points out that children who enter childcare during their first year can spend up to 12,000 hours in their ELC setting. Epstein's (2014) Theory of Overlapping Spheres of Influences highlights the intersection between home, school and community in children's learning and development. Epstein's six types of involvement are empirically grounded and used internationally as a framework to support parental and family engagement in their children's education:

- **Communicating**
- **Volunteering**
- **Learning at home**
- **Understanding the child as student**
- **Decision making**
- **Collaborating with the community**

In terms of promoting parental and family engagement it is important to consider how the environment can support these various types of involvement. Aistear (NCCA, 2009) and Síolta (CECDE, 2006) recognise that the environment should be inviting and welcoming for children and parents and that it should reflect each family's cultural capital. The environment of the ELC setting has a responsibility to support children developing a strong sense of belonging to their families and communities in addition to the setting itself (NCCA, 2009). The Environment can support parents and families through promoting:

- **A Sense of belonging**
- **Communication**
- **Engagement in play and learning activities**
- **Engagement in decision making**

Greenman (2007), challenges us to view ELC settings not simply as settings for children but as settings for families.

3.3.2a A Sense of Belonging

The Early Learning and Care environment should be designed to be visible in the community and easily accessible to parents and families (Gandini, 2012; Burke et al., 2016). Richardson (2011) suggests that for some parents and families, experiencing a sense of belonging to the setting comes easier than others. The ELC setting might be more welcoming for parents and families who share the language and culture of the setting, for example. For parents and families where the language and culture are different to their own, the ELC setting might be a less welcoming space (Richardson, 2011). Simple measures such as including photos of families, communicates that each family is valued in the setting. Clearly pictures, resources and displays should be selected which reflect all cultures, not just the dominant mainstream culture in the setting

(Brooker, 2010; Moyles, 2012; Fisher, 2018). Simple greeting messages which are often displayed at the entrance to ELC setting should be displayed in the family's home language if it is not English. Parents' and families initial contact with setting can set the stage for future interactions with the setting and staff (Ofsted, 2015; Fisher, 2018). Consequently, it is important that the environment, from the families very first contact with it, is enticing and inviting (Greenman, 2007; Gandini, 2012; Ofsted, 2015; Fisher, 2018). This is a definite prerequisite to increasing parental engagement during the child's time in the setting (Better Start Resource Centre, 2011).

3.3.2b **Communication**

Families should be able to find their place in the ELC setting and there should be spaces which easily foster communication between parents, families and staff. Sharing of information between parents and the setting is generally a priority in terms of parental engagement (NCCA, 2009). Including a notice board or display which is regularly updated offers an accessible means of communicating easily with parents. Information can be included on curriculum activities or special events. Visual supports would, again, be important for parents who may have learning difficulties or who have English as a second language (NCCA, 2009; Fisher, 2018).

The environment also needs to accommodate routine communication during drop-off and pick up and perhaps more formally organised ELC practitioner-parent meetings (OECD, 2012). For more formal meetings, privacy is important for parents and families (Richardson, 2011). Rather than having to engage in discussions in busy, public spaces, the environment should incorporate a comfortable, safe space for ELC practitioners to meet with parents. Moreover, the environment can support parents building relationships with other parents and families when it provides space for parents to communicate and collaborate with each other (NCCA, 2009; Gandini, 2009). The environment can facilitate parents to linger and engage with each other through the provision of sofas or chairs in the entrance area as in the Reggio Emilia environments (Gandini, 2012).

Opportunities for parental education make an important contribution to children's learning and development (Gandini, 2012; Ring and O' Sullivan, 2017). Ring and colleagues (2016), for example, found that parents did not consider play as contributing significantly to early learning (Ring, et al., 2016). This suggests that ELC settings need to engage more with parents around how informal and playful learning conditions drive early learning (Whitebread, Kuvalja and O' Connor, 2015). Many measures, such as increases to non-contact time for staff, are needed if ELC practitioners are to invest more time in parent education initiatives (O' Sullivan and Ring, 2018). Appropriate space and adequate resources (e.g. ICT resources), clearly play a part. Providing accessible, comfortable spaces for parent education activities will support parental understanding of the philosophy of the setting, in addition to encouraging them to continue to support their children's learning in the home environment (Greenman, 2007; Gandini, 2012; Whitebread, Kuvalja and O' Connor, 2015).

3.3.2c Engagement in Play and Learning Activities

The ELC environment can promote parental and family engagement through providing adequate space for parents and families to become directly involved in activities (Gandini, 2012; OECD, 2012; Whitebread, Kuvalja and O' Connor, 2015). Ideally the environment should be designed to facilitate more flexible parent involvement (Greenman, 2007). When children are transitioning to the ELC setting, for example, the environment should be able to accommodate them coming and going as they feel necessary (Greenman, 2007). Parents might volunteer to provide additional support during child-initiated activities or to develop an experience for children based on their own interests and expertise (Fisher, 2018). In Reggio Emilia pre-schools each child's parents are invited to spend a day in the pre-school (Gandini, 2012). Working with parents as volunteers rather than clients can help parents to aspire to have high expectations for their children which in turn is related to children's achievement (OECD, 2012). Including space and resources for initiatives such as a toy, games and a book sharing library can also increase parental participation within the setting and in their children's learning (Fisher, 2018).

Just as it is important to have spaces which accommodate all learners in the community to come together, these spaces should also be large enough to include families, children and staff coming together for events such as celebrations and performances (Gandini, 2012; Burke et al., 2016). It might not just be parents and siblings who want to join in celebrations but also grandparents, aunts, uncles etc. Moreover, the extended family might be more involved in child-rearing for families from more collectivist cultures than they are in families from individualist cultures (Maschinot, 2008).

3.3.2d Engagement in Decision Making

The extent to which parents become involved in decision making can vary and might involve engaging informally through day to day dialogue, through becoming involved in a parents' association or through sitting on a management board (Barnardos, 2006). According to Barnardos (2006, p.9), "Effective programmes encourage parents to become actively involved in the decision-making process within the setting. This involvement helps to develop positive partnerships between parents and staff and increases parents' understanding of how the setting operates".

In the Reggio Emilia pre-schools of Northern Italy, for example, parents are highly involved in the governance of the pre-schools (Gandini, 2012). In addition to contributing to decisions about the running of the service, policy, curriculum and pedagogy, parents can also contribute to decision making in respect of the learning environment. There should be opportunities, both formal and informal, to include parents and families in decision making in relation to the environment

(OECD, 2012; Burke et al., 2016). As ELC settings aim to become more inclusive for all learners and their families, parents can provide invaluable input in terms of how the home culture organises the environment to support learning (Brooker, 2010).

Parents can also be an invaluable source for resources. If the setting requires resources for a particular project or play area, then parents may often be in a position to contribute or to support fundraising initiatives, for example (NCCA, 2009). As Gandini (2012) points out, when parents are engaged in decision making, ideas are exchanged and new ways of educating are constructed. Providing opportunities for parents and families to become involved in decision making can help parents transition from more peripheral to full engagement with the setting (Best Start Resource Centre, 2011).

3.3.3 Standard Five: The Child and Interactions

Fostering constructive interactions (child/child, child/adult and adult/adult) requires explicit policies, procedures and practice that emphasise the value of process and are based on mutual respect, equal partnership and sensitivity.

Quality ELC is frequently articulated in terms of its structural and process features. Process quality is a dynamic construct and includes the interactions between children and adults and between children themselves. Process quality has been found to have a stronger association with child outcomes (NICHD, 2006). Interactions, therefore, have a salient influence on children's learning and development in the early years (Melhuish et al., 2015). According to the National Scientific Council on the Developing Child (2004, p. 2), "children who develop warm, positive relationships with their kindergarten teachers are more excited about learning, more positive about coming to school, more self-confident, and achieve more in the classroom". In the Irish context, both Aistear (NCCA, 2009) and Síolta (CECDE, 2006), recognise interactions as a key feature of high quality ELC. Consequently, the ELC environment should consider how:

- Interactions promote emotional warmth and security.
- Interactions promote play and learning.
- Interactions with peers support play and learning.

3.3.3a Interactions Promote Emotional Warmth and Security

An essential feature of interactions in the early years is providing children with emotional warmth and security (Whitebread and Coltman, 2011). This resonates with Deci and Ryan's (2008) ideas in relation to the innate human need to feel connected to others. From an attachment theory perspective, warm, secure relationships are considered fundamental. Young children need to have their

attachment needs met in order to become active players and learners (Howes, 2011). Children who do not feel emotionally secure in their ELC setting are unlikely to try out new activities and may have difficulty persevering when they encounter challenges (Whitebread, Dawkins, Bingham, Rhodes and Hemming, 2015).

Careful consideration should be given to the environment from which the child is transitioning (Whitebread et al., 2015). Many children may be coming from home to the setting and it is important to make connections between these two environments. As the home environment will generally be the environment young children feel most secure in, ELC settings can benefit from including features more common in a home environment. Kitchen and dining areas, for example, could be organised to allow for frequent, responsive interactions between adults and children during mealtimes, as might occur in the home environment. Creating a cooking and dining experience which mirrors that of a nurturing home environment is a key aspect of the Reggio Emilia approach where children are invited to join cooks to prepare meals and organise the dining experience (Gandini, 2012). Whitebread and colleagues (2015, p.30), illustration of a child articulating that “our classroom is like a little cosy house” perfectly captures how the environment can promote feelings of warmth and security for young children. To encourage interactions which support emotional warmth and security, there needs to be adequate space for adults to operate at the child’s level - adults need to be able to join children easily during play and routine activities such as mealtimes (Greenman, 2007).

In addition to various areas for specific activities, the inclusion of a quiet space where adults and children can easily connect, without distraction, is important. A child who is upset and needs comforting, for example, should have a calm space where they can easily connect with their key-worker. Regular settings can contain many environmental obstacles to children’s learning (Ring, McKenna and Wall, 2014). Children with Autism Spectrum Disorder (ASD), for example, can be incredibly sensitive to sensory input from the environment and successful engagement in learning can be dependent on adult interactions which provide children with the emotional support they need to effectively process environmental stimuli (Mastrangelo, 2009; Ring et al., 2014). A further issue in terms of promoting emotional warmth and security is the extent to which the environment is organised to support children’s interaction with siblings if they attend the same ELC setting. Children can often spend long days in the setting without ever having interacted with their siblings who are in other rooms (Greenman, 2007). Clearly, when the environment affords opportunities for siblings to come together, all children’s feelings of warmth and security are supported.

3.3.3b Interactions Support Play and Learning

In Ireland and elsewhere, policy makers, educators and parents all emphasise emotionally warm and secure interactions as critical to children's well-being (OECD, 2012; CARE, 2015; Whitebread et al., 2015). In addition to promoting emotional warmth and security, the research suggests that high quality interactions between children and adults also need to foster children's learning (Fuller, Anguiano and Gasko, 2012; Pianta, Hamre and Allen, 2012; Pino-Pasternak et al., 2010; CARE, 2015). As part of the Curriculum and Quality Analysis and Impact Review of European Early Childhood Education and Care (CARE), the Classroom Assessment Scoring System (CLASS) was used to evaluate classroom quality across seven European countries. Classroom practices across these countries all scored high on social-emotional process quality but in the mid-range on the educational dimensions of CLASS (CARE, 2015). Interactions which support the educational dimension of children's experience generally tend to support children's feelings of control, provide cognitive challenge and stimulate articulation of learning (Whitebread and Coltman, 2011).

A well-organised environment is, perhaps, more important in a climate which promotes child-initiated play and learning than in a more traditional instructional context which is more tightly controlled by adults. Interactions which support children's feelings of control will enhance children's sense of ownership of their own learning and of their learning environment. When adults give children control over activities, this ensures activities are meaningful and connected to their interests, resulting in more effective learning (Pino-Pasternak et al., 2014). When children have easy access to resources and when they are offered a genuine choice of activities, adult interactions can focus on encouraging children to do things independently rather than adults doing things for children (Whitebread et al., 2015). When the environment is flexible, rather than static, interactions stimulate dialogue with children around their emerging interests and adapt the environment to respond to these interests. As suggested by Howard and McInnes (2013, p. 66), children should have an environment in which they are "able to form and transform at will". When the environment is well organised children can independently go about the business of playing and learning. Adult interactions can extend learning rather than devoting excessive amounts of time to setting management (Whitebread, et al, 2015).

Cognitive challenge involves interactions which provide achievable challenge with appropriate support through experiences such as child-initiated play. Young children are immensely open to new experiences and providing appropriate levels of cognitive challenge will encourage effective learning. Approaches identified in the research as being effective in providing adequate cognitive challenge include Sustained Shared Thinking (SST) (Siraj-Blatchford and Sylva, 2004) and contingent scaffolding (Pino-Pasternak, et. al, 2014). To engage in interactions which provide cognitive challenge, at a basic level adults need to be able to interact easily with children. While Montessori's influence can be seen in the proliferation of child scaled environments in childcare settings, Greenman

(2007, p. 82) argues that “a mixture of adult and child scale is valuable for both caring and learning and minimises the teacher as an outsized Gulliver in a Lilliputian world”.

While consistency and predictability are important for promoting emotional warmth and security, young children also need new experiences to satisfy their innate curiosity and drive to understand how the world works. Adults need to carefully plan, based on interests, how the environment can be used to provide the type of challenging experiences which allow children to build on prior learning, make connections and to construct new learning. Arnold (2015) provides a wonderful overview of how one reception classroom in the UK facilitated children learning about the life-cycle of a chicken. As part of this learning experience an incubator and eggs were hired to provide the children with meaningful first hand learning opportunities. The presence of the incubator in the immediate classroom environment proved to be an important source of learning over an extended period as children, in collaboration with adults, monitored the hatching chicks (Arnold, 2015). Sargent (2011), adopting the idea of ‘provocation’ from Reggio Emilia, discusses how the environment can be organised in a way in which objects or pictures can be used to provoke inquiry-based learning. To provoke thinking on the topic of minibeasts, for example, she describes how a paper-mâché cocoon with a minibeast toy inside was attached to the classroom ceiling and the adults waited for the children to notice this new arrival. Adults then, through making suggestions and asking open-ended questions were enabled to facilitate sustained shared learning across a number of weeks (Sargent, 2011).

Articulation of learning which involves children engaging in reflection and extended conversations about their learning has been highlighted as an important feature of interventions designed to positively impact on learning and development (Whitebread and Coltman, 2015). The High Scope Curriculum (Schweinhart, et al., 2005), for example, encourages this type of articulation of learning through its plan-do-review component and play-planning is also a key feature of the Tools of the Mind Curriculum (Bodrova and Leong, 2007). Interestingly, both these models are associated with a range of socio-emotional and cognitive outcomes (Schweinhart et al., 2005; Blair and Raver, 2014).

The environment can support children to articulate their learning in a number of ways. At the most fundamental level, we can draw children’s attention to aspects of the environment and resources which foster new and deep learning. While children are multi-modal communicators, during the preschool years, encouraging children to verbally articulate their learning is a key curriculum priority. Consequently, the environment needs to foster dialogue and verbal communication. Jarman’s (2015) Communication Friendly Spaces™ (CFS™) approach focuses on how the environment supports talking, listening and children’s overall engagement in learning. This approach encourages adults to reflect on traditional ideas in relation to how we design environments in

terms of how responsive they are to children's learning needs. The approach draws heavily on Reggio Emilia philosophy and challenges ideas in relation to colour schemes, room layout, displays and quantity of learning resources. Observation and assessment are at the heart of the CFS™ approach and adults are encouraged to consider how the environment might potentiate or inhibit communication from the child's perspective.

Drawing again on Reggio Emilia philosophy (Edwards, Gandini and Foreman, 2012) and Gardner's (2004) ideas on Multiple-Intelligences (MI), children can articulate their learning in an infinite number of ways. The environment needs to provide opportunities for children to share their learning with adults, through language but also through various visual media and play types (Gandini, 2012). Displays are another aspect of the environment through which children can articulate their learning. Displays support learning when they have a clear purpose for children, when children have ownership over what is displayed and when displays are interactive (Whitebread et al., 2015). Adults should endeavour to interact with children continually around how displays are used in their room.

3.3.3c Interactions with Peers Support Play and Learning

While children need to experience learning opportunities which are sensitively guided by adults, they also need to experience freedom (Burke, Barfield & Peacock, 2016). Freedom, in particular, to interact with peers is a key source of learning in the early years. The CARE (2015) review of childcare across 7 European countries identified a focus on dyadic interactions between adults and children which, they recommend, needs to be balanced with a stronger focus on the peer group itself as a community of learners (CARE, 2015). Primarily, when children have opportunities to learn independently, they create what Vygotsky referred to as a unique 'Zone of Proximal Development' (ZPD) where the group collectively acts as a more knowledgeable other (Bodrova and Leong, 2015). For these reasons, opportunities for independent play and activities with peers are conducive to many of the goals of early learning and care such as developing self-regulation, social competence, friendships, language and creativity (Rubstov and Yudina, 2010; Weisberg, Kittredge, Hirsh-Pasek, Michnick Golinkoff and Klahr, 2015). Independent activity with peers affords children the opportunity and space to lead their own learning. In many classroom activities adults can assume the regulatory role, potentially reducing the opportunity for children to regulate their own behaviour and interactions and to follow their own creative processes (Whitebread, 2012; O'Sullivan, 2016; Gray, 2015). As suggested by Rubstov and Yudina (2010), while play might be free for the child, it is not so free for the ELC practitioner, who must ensure that it remains free. ELC practitioners and ELC designers, therefore, need to consider how the environment can be designed and organised to maximise interactions between peers.

Firstly, if the aim is to encourage more independent play with peers and adults, while taking a less active role in interactions, adults still need to be able to easily supervise children's interactions with each other. Adults need to be able to see any potential safety issues and easily identify scenarios where they might be needed to mediate in interactions between peers (Jones and Reynolds, 2011). Children have different ways of interacting with their peers and the environment needs to take cognisance of this (National Scientific Council on the Developing Child, 2004).

UNICEF (2014) emphasises the need for child-friendly environments to be gender-sensitive, ensuring both boys and girls have equitable opportunities to learn and develop to their full potential. Recognising and responding to the interactional styles of boys and girls is important in creating ELC settings which are gender-sensitive. The research suggests patterns in terms of how boys and girls interact with others. Boys often prefer to play in more open spaces, in larger groups and further away from adults whereas girls often prefer to play in quieter areas, in smaller groups and in closer proximity to adults (Martin et al., 2011; Frost et al., 2012). To facilitate the interactional preferences of boys and girls, the environment should include large open spaces and more intimate smaller spaces.

Culture can also influence children's interactional patterns. Trawick-Smith (2010), in a study of play in a Puerto Rican preschool found that children tended to play in very large groups, often with up to twelve children, and with little adult involvement. In other contexts, children might demonstrate more of a preference for dyadic or triadic interactions. Careful observation will allow adults to adapt the environment based on children's preferences. Moreover, the environment can be adapted to facilitate interactions. Where boys and girls may be less inclined to play with each other, creating play and activity centres which incorporate the interests of boys and girls has been found to increase mixed sex interactions (Johnson et al., 2005; Frost et al., 2012; Moyles, 2012). Similarly, where children experience different ways of play and learning in their home cultures, simple environment or resource modifications can support their transition to the ways of play and learning promoted in the setting (Brooker, 2010; Moyles, 2012).

The setting needs to take cognisance of how the environment can support peer interactions for children with additional needs. Children with additional needs have been found to spend more time engaged in solitary activities and more time interacting with adults than peers (Brown & Bergen, 2002). On an individual basis, the setting should be evaluated to investigate how the environment may be hindering or supporting children with additional needs interacting with peers. For some, it may involve looking at how the environment can support communication, for others it may involve looking at how the environment can support full access to, and participation in, various play areas and activities.

Gray (2013) presents a solid argument for the role of mixed aged groupings in fostering children's learning. This resonates with Montessori who also emphasised the mixed age groups as a context for peer scaffolding and for developing leadership dispositions (Whitebread, Kuvalja and O' Connor, 2015). A recent small-scale comparative study on mixed-age groupings of children aged three-to-five years in Ireland and Italy highlighted all ELC practitioners beliefs that mixed-age groupings contribute significantly to children's social and emotional development and their communication and language skill (McCarthy, 2017). As it is generally the case in Ireland that children are grouped based on age in ELC settings, the environment can support interactions between children in different classrooms through providing shared spaces where children from different rooms can come together (Burke et al., 2016). This is similar to the need for the environment to foster emotional warmth and security through supporting interactions between siblings in the childcare setting (Greenman, 2007). Such spaces may be outdoors, involve a communal area indoors or a dining space (Burke et al., 2016).

Burke and colleagues (2016) discuss the importance of the environment having a 'heart'. At the heart of the environment should be a place where everyone in the setting can easily come together. This resonates with the Reggio Emilia concept of the 'Piazza', a centrally located communal space (Gandini, 2012). The inclusion of glass walls or partitions can nurture interactions with children outside of the immediate classroom environment (Gandini, 2012).

3.3.4 Standard Six: The Child and Play

Promoting play requires that each child has ample time to engage in freely available and accessible, developmentally appropriate and well-resourced opportunities for exploration, creativity and 'meaning making' in the company of other children, with participating and supportive adults and alone, where appropriate.

Congruent with developments internationally, in Ireland, play is recognised as a key context through which young children learn and develop (NCCA, 2009). Play is best conceptualised as a motive or attitude (rather than a behaviour per se) which is characterised by autonomy, a focus on means over ends, internal rules, imagination and an active non-stressed mind-set (Gray, 2013). For play to optimally support learning and development it is crucial that children have choice, that activities are intrinsically motivating, provide opportunities for them to make up their own rules and to use their imagination. When learning experiences foster these features of play or playfulness children learn in an active and non-stressed manner, which is associated with optimal learning (Gray, 2013; Ring & O' Sullivan, 2018). A growing corpus of research endorses the view that playful conditions have a differential impact on learning and development. Play has been associated with gains in problem-solving (Thomas, Howard & Miles, 2006), language (Weisberg, Zosh, Hirsh-Pasek and Michnick Golinkoff, 2013), mathematical understanding (Wolfgang, Stannard and Jones, 2003) and

various measures of self-regulation (Gayler & Evans, 2001; Becker, McClelland, Loprinzi, and Trost, 2014; O’ Sullivan, 2016).

As the empirical basis for playful learning continues to grow, play has become more centrally located within the early years curriculum. Consequently, it has become increasingly necessary to create ELC environments which provide opportunities for children to develop complex and sustained play. The play and learning environment is a key feature of structural quality with the overall quality of the child’s learning environment strongly linked with learning outcomes (OECD, 2012; Melhuish et al., 2015). The play environment can promote, to varying degrees: children’s interests, identity and belonging, interactions, self-regulation, language and communication, and a range of thinking and problem-solving behaviours (Whitebread et al., 2015). Consistent with this view, Loris Malaguzzi located the environment at the core of his philosophy and consequently the environment is known as “the third teacher” within the Reggio Emilia approach (Gandini 2012). For the purposes of the present review, the play environment will be discussed in respect of:

- Facilitating diverse play opportunities,
- The indoor play environment,
- The outdoor play environment,
- Toys and play materials,
- Collaborating with children around the design of their play environment.

3.3.4a **Facilitating a Diverse Range of Play Opportunities**

Aistear (NCCA, 2009), Siolta (CECDE, 2006) and The Quality Framework for Early Years Education-focused Inspections (DES, 2018) all acknowledge the need to provide children with a well-resourced diet of play opportunities to ensure play is a central mechanism through which children learn and develop. Children benefit from a broad range of play experiences including physical play (active exercise play, rough and tumble play, and fine-motor practice), object play (exploring and experimenting, constructing and making), symbolic play (with language, music, visual media reading, writing and mathematical graphics), pretend play and games with rules (Whitebread, Babilio, Kuvalja and Verma, 2012). These five types of play can be solitary or social, child-initiated or adult-guided and can occur indoors or outdoors. Moreover, these five categories of play are not mutually exclusive. Trawick-Smith’s (2010) concept of ‘primary play’ and ‘embedded play’ reflects the tendency of children to transition between different types of play.

In terms of play provision, it is also important that children have opportunities to learn through child-initiated play and sensitive adult-guided play (OECD, 2012; Weisberg et al., 2015; O’ Sullivan and Ring, 2018). Having autonomy is a key feature of playful learning and as such, creating an environment which supports children to lead their own learning should be a priority. Children

will certainly struggle to be active learners who lead their own play if the environment is difficult to navigate and toys and play materials cannot be sourced independently. While child-initiated play is conducive to many of the goals of early childhood such as developing self-regulation, social competence, creative and problem-solving, the research also highlights the significance of adult-guided play for learning (Weisberg et al., 2015; Whitebread et al., 2015). In the absence of guided play, children might not spontaneously access important curriculum content. When adults become sensitively engaged as co-players, they can provide emotional warmth and security, cognitive challenge and model rich vocabulary and explanations. This type of involvement has been found to enhance, rather than marginalise, children's learning through play (Trawick-Smith and Dziurgot, 2011; Whitebread and Coltman, 2011; Weisberg et al., 2015). Consequently, the play environment also needs to be a place which is inviting, comfortable and accessible for adults (Greenman, 2007).

3.3.4b The Indoor Play Environment

At the most basic level, children require adequate space to play. Adequate space reduces stress and promotes well-being which is pre-requisite to effective playing and learning (Whitebread, Kuvalja and O' Connor, 2015). The minimum space requirements for ELC settings are set out in The Child Care Act 1991 (Early Years Services) Regulations 2016 (DCYA, 2016). All registered services providing the universal pre-school programme (ECCE scheme) must provide a minimum of 1.8sq metres per child (2.3 sq. metres after scheme hours). In a review of quality early childhood education Whitebread and colleagues (2015) found that well designed spaces were associated with more positive interactions and more time spent exploring the environment. A high quality play environment should provide areas or zones which offer specific play experiences and spaces for children to make their own (Frost, Wortham and Reifel, 2012). Such areas encourage independence as children will know what experiences are afforded in various centres. Montessori strongly advocated for a prepared environment which she saw as critical to fostering independence in learning (Whitebread, Kuvalja and O' Connor, 2015). Children will learn where things are and recognise boundaries and how areas are separated (NCCA, 2015). ELC settings often include areas for:

- Pretend play
- Music
- Visual media
- Sand and water
- Constructing and making
- Book sharing
- Writing/ mark making
- Quiet activities.

A consideration is the extent to which areas are conflicting or complimentary. It might not be most effective, for example, to position a busy area, such as constructing and making, right beside an area for quieter activities. An option is to partition off certain areas to encourage sustained and complex play (Frost et al., 2012). While more closed and designated spaces can support play, children benefit from an environment which incorporates more fluid open spaces (Frost et al., 2012; Howard and McInnes, 2013). Open spaces allow for children to come together in bigger groups and to select and combine materials from various areas. While children can benefit from having specific areas which provide specific play opportunities, it is also important to include spaces which children can make their own. Broadhead (2010, p.46) describes creating what one child described as “the whatever you want it to be place”. Her research suggests that the provision of a more open-ended space led to high levels of collaboration and more complex play as ‘an anything you want it to be place’ did not suggest any one way of playing (Broadhead, 2010).

Consideration should also be given to how children move between play/activity areas. Undertaking a movement or flow chart can give important information as to how the environment is being used and the pathways children take between different play areas (Johnson, Christie and Wardle, 2005; Greenman, 2007). If certain areas are over or under used then adults can plan how the environment can be altered to support pathways between certain areas. As set out in The Child Care Act 1991 (Early Years Services) Regulations 2016 (DCYA, 2016), children require access to quieter spaces in which they can engage in self-initiated activities such as reading or listening to music. In addition to considering how the environment can provide for the main types of play, consideration should also be given to how the play environment supports more quieter and solitary play experiences in addition to small and large group play (Greenman, 2007).

Children play and learn everywhere. Trawick-Smith (2010) found in his study of play in Puerto Rican preschools that play often occurred in unexpected places rather than in the areas designed for specific play types. This suggests that observation of children’s interaction with their play environment is critical to the provision of high quality play. Interaction with the play environment will most likely change between different cohorts and among the same cohort over the duration of their time in the setting. Moreover, as childcare settings continue to embrace diverse learners, a one size fits all environment becomes less tenable. Children who have language, visual or hearing challenges, for example, will all require tailored supports to independently navigate their play environment (Greenman, 2007; Howard and McInnes, 2013).

3.3.4c The Outdoor Play Environment

Western industrialised countries such as Ireland have traditionally focused more on developing indoor rather than outdoor play environments. This is in contrast to Scandinavian countries where there is a strong tradition of playing and learning outdoors. There is a recognition that high quality early learning and care is best facilitated through balancing opportunities to learn indoors

with opportunities to learn outside (OECD, 2012). Consequently, The Child Care Act 1991 (Early Years Services) Regulations 2016 (DCYA, 2016) now require services registered before June 2016 to have a suitable, safe and secure outdoor space (on or off the premises) accessible to the children daily and for those registered after June 2016, this outdoor space must be available on the premises. The indoor and outdoor learning environments are essential to promoting learning and development. Indoor and outdoor play spaces should be complimentary and integrated, and should aim for flow rather than separation (Johnson, Christie and Wardle, 2005; Greenman, 2007; Frost et al., 2012). Moreover, every room in the ELC setting should have easy access to the outdoor environment, ideally a direct level connection (Burke et al., 2016).

Tovey (2007), challenges educators to reflect on whether the outdoor area is simply a physical space or a place which is meaningful for children. All types of play can just as easily be facilitated outdoors as well as indoors. The outdoor environment can be more conducive to physical play, allows for construction on a larger scale and provides a range of natural materials for children to transform, explore, experiment with and to design and make with. A key affordance of the outdoor play environment is its dynamic quality (Tovey, 2007). Weather alone can lead to the same space being transformed overnight, grass which was wet and muddy can suddenly become hard and cold after a spell of frost. The Forest School Approach, initially developed in Scandinavia, is now gaining momentum across Europe. The Forest School Approach places a strong emphasis on experiential learning through direct contact with nature in woodland settings (Knight, 2011). The promotion of this type of child-initiated experiential learning outdoors is believed to foster well-being through affording opportunities to connect with nature and others, problem-solving and risk-taking (Knight, 2011; Moyles, 2012). While The Forest School Approach has its own distinct content and methodologies, it is clear that all early learning environments can be enriched through providing opportunities for children to engage with the natural world in an experiential and playful way. In the new Cambridge University Primary School, nursery and reception classrooms have access to a wild wood in their playground (Burke et al., 2016).

A high quality outdoor play environment requires careful planning similar to the indoor environment. Tovey (2007) recommends that an ideal outdoor learning environment should have the following features:

- Designated and connected spaces
- Elevated spaces
- Wild spaces
- Spaces for exploring & investigating
- Spaces for mystery & enchantment
- Natural spaces
- Space for the imagination
- Space for movement & stillness
- Social spaces
- Fluid spaces

While risk taking can be considered a feature of all play experiences, the outdoor play environment is particularly conducive to allowing children engage in risk taking as, according to Tovey (2010, p.80-81), such play can “thrive in the more open, flexible, diverse and indeterminate nature of the outdoor environment where children have greater space, freedom of movement, choice and control”. In an ELC setting a culture of risk aversion rather than of risk promotion often dominates (Tovey, 2010). Research undertaken by Sandseter (2007), in Norwegian preschools generated 6 categories of play in which children engaged and promoted risk taking behaviours:

- 1 Play with great heights
- 2 Play with high speed
- 3 Play with harmful tools
- 4 Play near dangerous elements
- 5 Rough-and-tumble play
- 6 Play where the children can ‘disappear’/get lost

A key challenge when creating high quality outdoor play environments is balancing children’s safety with their needs to explore, experiment and challenge themselves (Sandseter, 2007; Tovey, 2010). As Tovey (2007) suggests, we should strive to promote environments that are “safe enough” rather than as “safe as possible” to avoid creating environments which are underwhelming and under stimulating, leading to disengagement from learning and feelings of incompetence (Tovey, 2007; Howard and McInnes, 2013). Given that climate is often identified as a barrier to facilitating play outdoors, a covered outdoor play area can be invaluable in allowing children to play outdoors irrespective of weather conditions (Frost et al., 2012; Burke et al., 2016).

3.3.4d Toys and Play Materials

Within the ELC environment, play opportunities should be freely available, accessible, appropriate and well-resourced (DES, 2018). Toys and play materials can have a profound influence on the quality of children’s play as approximately 90% of young children’s play involves some type of toy or play material (Trawick-Smith Russell and Swaminathan, 2010). Toys and play materials can influence the social, emotional and cognitive affordances of play and the quantity and quality of available materials requires careful consideration. While providing plenty of choice is important, Howard and McInnes (2013, p. 66) rightly caution that a “room packed with equipment might look attractive and well-resourced but may not leave any scope for real playing to take place”.

As illustrated in Figure 18., when selecting toys and play materials, it is important to balance structured materials such as puzzles or character toys with more unstructured or open-ended materials such as featureless toys and loose parts (Johnson, Christie and Wardle, 2005).

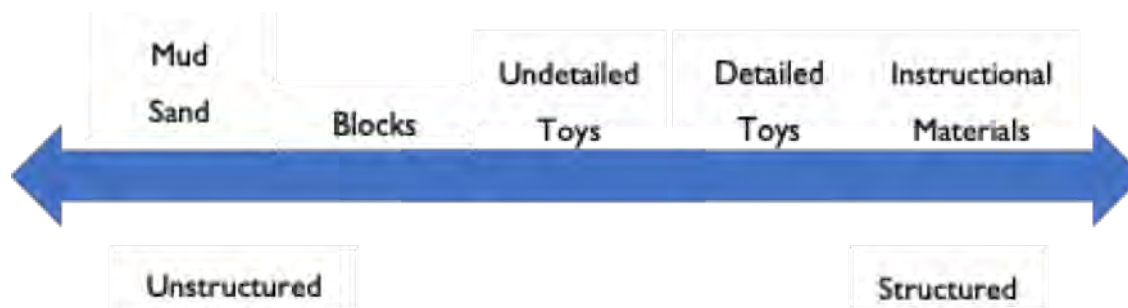


Figure 18. Continuum of Toys and Play Materials (Johnson, Christie and Wardle, 2005)

Materials which are more open-ended and suggest many possible uses are increasingly associated with high quality learning (Expert Advisory Panel on Quality Early Childhood Education and Care, 2009; Whitebread, Kuvalja and O' Connor, 2015). The philosophies of Steiner and Malaguzzi have emphasised the benefits of more natural toys and play materials for children's learning and development (Howard and Mc Innes, 2013). The pioneering work of Goldschmeid and Jackson (1994), on the affordances of Treasure Baskets and Heuristic Play, has also inspired settings to give natural materials a more dominant role in the environment. Natural materials offer more possibilities as they have multiple uses and consequently inspire a range of creative and problem solving behaviours (Greenman, 2007; Howard and McInnes, 2013). When organising the environment it is important to facilitate children using materials from various areas, given that the fluid nature of play can lead to one type of play being embedded in another (Trawick-Smith, 2010).

The environment needs to balance young children's need to revisit favoured play materials with their need for new and novel experiences. This can be achieved through rotating materials and introducing new materials. Children are not always drawn to materials that are most beneficial for development. Consequently, practitioners should not only observe what children are playing with but also what they do with materials when playing with them (Trawick-Smith, Wolff, Koschel and Vallarelli, 2014). Trawick-Smith and colleagues (2010), at the Center for Early Childhood Education, Eastern Connecticut State University are conducting an ongoing empirical study on preschool children's engagement with toys and play materials, the TIMPANI (Toys that Inspire Mindful Play and Nurture Imagination) Toy Study. This research suggests that toys and play materials should be evaluated in terms of their potential to promote:

- Thinking and learning behaviours (e.g. studying objects/commenting on new concepts/discoveries)
- Problem-solving behaviours (e.g. overcoming challenge)
- Curiosity and inquiry behaviours (e.g. engaging in exploration/experimentation)
- Sustained interest (e.g. persisting)
- Creative expression (e.g. using toys in novel ways)
- Symbolic transformations (e.g. making one thing represent another)
- Interacting, communicating, and collaborating with peers
- Autonomous play with toys (e.g. without adult assistance)

Recent research suggests that a one size fits all approach to the provision of toys and play materials may be inadequate. Trawick-Smith and colleagues (2015) in a study of the effects of toys on the play quality of preschool children found that boys and girls engaged with the same toys in different ways. The findings from this research suggest that some toys were associated with higher quality play for boys and others for girls (Trawick-Smith et al., 2014).

Culture is also recognised as having an influence on children's play and it is not surprising that in this research children from different cultures engaged in play of varying complexity with the same toys. According to Trawick-Smith and colleagues (2014:6), this reflects "cultural differences in family play experiences, social and thinking styles, and even world views". Some toys were used in a more complex way when used by Latino children and others when used by Euro-American children (Trawick-Smith et al., 2014). Similar results were found for children from varying socio-economic groups with some toys eliciting higher quality play for children from lower socio-economic groups and others for children from middle socio-economic groups (Trawick-Smith et al., 2014). As concluded by the authors, the most critical implication of this research is that "teachers must be observant, reflective, and responsive to individual children's needs as they equip their classrooms with toys, just as they are in all other aspects of teaching" (Tawick-Smith et al., 2014).

Storage of toys and play materials is another important aspect of the play environment (Greenman, 2007; NCCA, 2015). Ideally, children should be able to access toys and materials independently of adults. In the tradition of Montessori, when children can do this, they are empowered to make decisions and take responsibility for their own play and learning (Whitebread, Kuvalja and O' Connor, 2015). It is also important that children can return to favoured toys and play materials and that they have opportunities to preserve works in progress (such as a block construction), if they need to (Whitebread et al., 2015).

The outdoor play environment offers unique affordances in terms of readily available natural play materials which allow children take responsibility for building their own play environment (Whitebread et al., 2015). Traditional play activities such as 'den making' are highly attractive to children, encourage

engagement with natural materials and loose parts, inspire various types of play such as constructing and pretense, and encourage collaboration between peers as children use materials to build their own play environments (Brock, Dodds, Jarvis, and Olusoga, 2009).

3.3.4e Collaborating with Children around the Design of their Play Environment

The research suggests that children are often excluded from decision making around play, as adults do not appreciate their competence to contribute (Lester and Russell, 2008). Initiatives such as The Guardian newspaper's "School I'd Like" survey and resulting Children's Manifesto (Birkett, 2011), clearly demonstrate children's capacity to articulate their preferences when it comes to the learning environment. Children surveyed made many references to the physical environment. Suggested features of an ideal physical environment include features such as lots of colour, fountains and glass domes, climbing frames, tree houses and rock-climbing areas, spaces to chill-out, pets, vegetable and flower gardens and a friendship bench. In terms of design, it is important to consider what the environment looks like from the child's perspective, as this can be quite different to what it looks like from the adult's perspective. When the play environment is designed according to adult selected themes and resources, it is unlikely that it will truly respond to children's needs and interests (Rogers and Evans, 2008). The environment should be conceived as constantly evolving and children should be consulted with regarding their needs and preferences on an on-going basis. Collaborating with children around the design of their play environment and the selection of play materials ensures that materials reflect their authentic play interests (Trawick-Smith, Russell & Swaminathan, 2011). Consulting with children regarding their play environment is important in "guarding against 'adulterating' children's play with adult agendas" (Lester and Russell, 2008, p.36).

3.3.5 Standard Eleven: The Child and Professional Practice

Practising in a professional manner requires that individuals have skills, knowledge, values and attitudes appropriate to their role and responsibility within the setting. In addition, it requires regular reflection upon practice and engagement in supported, ongoing professional development.

3.3.5a Quality in ELC

Compelling research evidence suggests that high quality ELC is associated with a range of immediate and deferred benefits for children, families and society from developmental, educational, social and economic perspectives (Schweinhart et al. 2005; Heckman 2013; Melhuish et al., 2015). It is acknowledged that definitions of quality are not universal and are linked to differing images of the child; understanding of early learning and care and the role of ELC settings as well as specific societal climates. However, increasingly research continues to identify key elements of quality ELC that can be transferred across different political, social and cultural contexts, while simultaneously cautioning that these contexts have to be considered in the measurement and assessment of quality (Sylva et al. 2004; Harms et al. 2006; Brassard and Boehm, 2007; Pianta, La Paro and Hamre, 2008; Edwards et al., 2012; Harms et al. 2015; Melhuish 2015; Melhuish et al. 2015; Whitebread et al., 2015; López Boo et al. 2016). Indicators of high quality early learning and care provision have been distilled by Melhuish (2015) and are summarised in Figure 19.

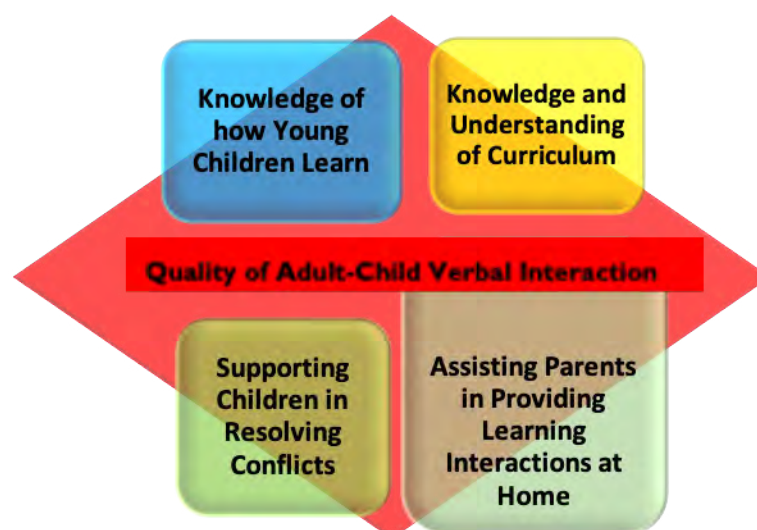


Figure 19. Indicators of High-Quality Early Learning and Care Provision (Melhuish 2015)

Underlying this distillation is a large corpus of research identifying what constitutes best practice in each of the areas identified. The National Association for the Education of Young Children (NAEYC) in the U.S. has similarly identified ten early learning standards for quality in early learning and care programmes that include relationships; curriculum; teaching; assessment of child progress; health; teachers; families; community relationships; the physical environment and leadership and management (NAEYC, 2016).

Quality can be broadly conceptualised as involving a range of structural and process dimensions (O'Sullivan and Ring, 2016). Acknowledging that structural aspects of quality can predict process aspects of quality, the evidence suggests

that process aspects of quality have a stronger association with child-outcomes (National Institute for Child Health and Development (NICHD, 2016). The principles underpinning Aistear: The Early Childhood Curriculum Framework (NCCA, 2009); Siolta: The National Quality Framework (CECDE, 2006); A Guide to Early-years Education-focused Inspections (EYEI) (DES, 2018) and The Childcare Act 1991 (Early Years Services) Regulations 2016 (DCYA, 2016) are reflective of the process components of provision required to ensure quality in early learning and care provision. At the same time, building on the Competence Requirements in Early Childhood Education and Care (CoRe) report (Urban, et al. 2011) and the concept of 'competent systems', the European Quality framework (European Commission Thematic Group on ECEC Quality, 2014) identifies five inter-related areas of structural quality that are critical to quality provision. These include access, workforce, curriculum, monitoring and evaluation, governance and funding. 'Competence' emerges in reciprocal relationships between all elements of the ELC system: individuals, institutions, and the governance of the system on national and on international levels. Ultimately, responsibility for quality provision is distributed across both process and structural elements with major implications for the status and gender balance of the workforce, for practitioner training (accredited and in-service), for professional autonomy and involvement in decision making, for leadership and quality assurance, evaluation and feedback/appraisal. What is clear is that without competent professional practice, a competent system cannot exist.

3.3.5b **Competent Professional Practice**

Competent professional practice is inextricably linked to the indicators of quality provision identified by Melhuish (2015) in Figure 18. above (Urban et al., 2011; Urban, 2016; Urban et al. 2017; Whitebread et al., 2015). Research suggests that professional competence is related to the three interconnected spheres of knowledge(s); practices and values (Urban et al. 2017). Urban et al. identify the foundation for competent professional practice in early learning and care as knowledge related to working with children; families; other professionals and early childhood at local and international levels. In this context, Ring, et al. (2018) suggest that adopting a critical and reflective approach to knowledge acquisition is central to ensuring that the knowledge acquired is translated into practice and continues to infuse and propel the ELC practitioner's professional journey. First 5 (2018) proposes a Workforce Development Plan to aim for a graduate led ELC workforce and ensure all staff have career development opportunities.

The literature suggests that the development of self-efficacy and capacity in a context that promotes critical reflection is central to translating knowledge into practice (Bonfield and Horgan 2016; Ring et al. 2018). Through the development of self-efficacy, ELC practitioners acquire a belief in their ability to influence learning and capacity is equated with the potential for growth as competent professionals (Tschannen-Moran and Woolfolk Hoy 2001; McDiarmid and Clevenger-Bright, 2008). Critical reflection promotes reflection on pre-

conceptions; perceptions; values; attitudes; beliefs; experiences and practice as a core activity of competent professional practice (Dewey 1916; Schön 1983;1987; Bonfield and Horgan, 2016).

Personal and professional values have been identified as comprising the lens through which ELC practitioners interpret knowledge and engage in practice (Ring et al., 2018). Professional values are clearly articulated in the range of policy frameworks and curriculum documents underpinning Early Learning and Care in Ireland (CECDE, 2006; NCCA, 2009; NCCA, 2015; DCYA, 2016; DES, 2018; Government of Ireland, 2016). Personal values influence how the ELC practitioner interprets and ultimately practices professional values. Ring et al. (2018) suggest that the values underpinning policy frameworks and curriculum documents in Ireland are reflective of a democratic system as suggested by Dewey (1916) and are infused with the principles of human rights; social justice; respect for diversity; empathy and a view of early learning and care as a public good and responsibility.

3.3.5c An Environment Reflecting a Democratic ELC and Education System

Greenman (2007) suggests that the early years practitioner has three major environmental roles: environmental planner: environmental participant and environmental evaluator. See Figure 20. for a summary of the responsibilities associated with these roles.

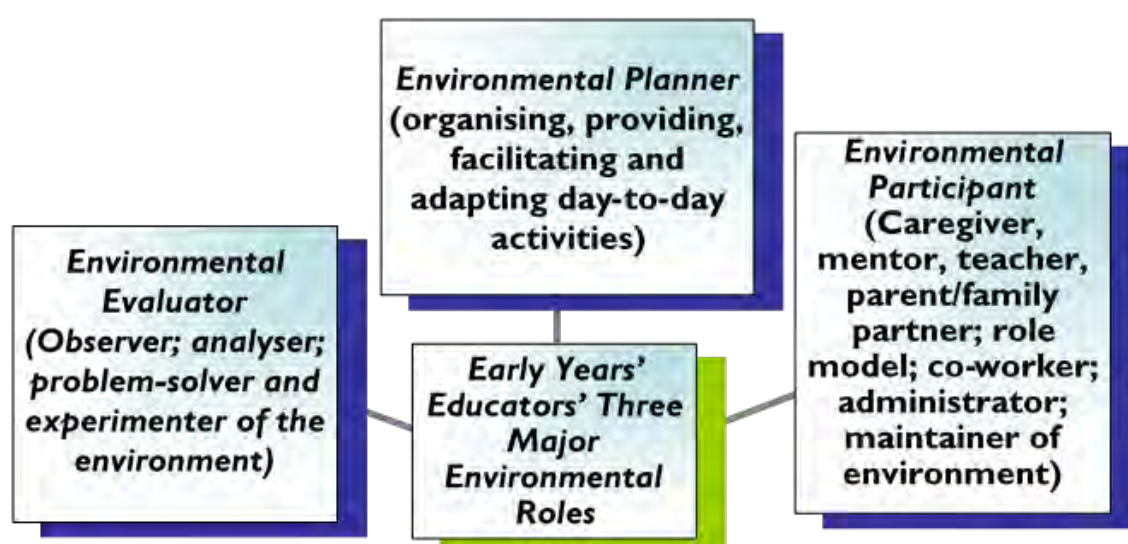


Figure 20. Early Learning and Care Practitioners Three Major Environmental Roles (Greenman 2007)

The knowledge (s), practices and values of the practitioner will therefore determine the efficacy of these roles and their impact on children's learning and development in the early years. The good practitioner creates an environment that provokes and sustains investigation; scaffolds the child's experience and guides the child to greater understanding, mastery and new discoveries (Greenman, 2007). The challenge facing early years practitioners is to de-institutionalise early childhood spaces and transform them into environments underpinned by a democratic concept of childhood that enables children to explore, discover, celebrate and truly inhabit the world (Greenman, 1998).

3.3.6 Standard Sixteen: The Child and Community Involvement

Promoting community involvement requires the establishment of networks and connections evidenced by policies, procedures and actions which extend and support all adults' and children's engagement with the wider community.

3.3.6a ELC Settings and Community Involvement

In the philosophy of Reggio Emilia, the education and care of young children is conceptualised as a community-based concern and responsibility. The presence of the setting represents a statement about the respect for the rights of children and families in the community (Gandini, 2012). This philosophy is also reflected in the concept of children's education as a community project in the early childhood services in San Miniato in Northern Italy (Fortunati, 2014). The central role of the community in early learning and care provision in Italy is linked to historical, political and cultural factors. Family participation in the creation of early childhood provision and the development of ELC settings within the community are key principles embedded in the concept of social management underpinning law 1044, introduced to make ELC settings more widespread in Italy (Fortunati 2014). Greenman (2007) highlights the impact of a rapidly changing western society on the concept of community, observing that links with neighbourhood, school and extended family are less defined than decades ago. The detrimental impact of weakening civic engagement on society continues to raise concerns globally with virtual strands generated by technology replacing traditional social ties (Sander and Putnam, 2010). The connectedness of young children with the community has changed in terms of their time spent playing freely in backyards, fields and streets, with their journeys predominantly destination-driven and controlled by adults (Greenman 2007). Research has consistently demonstrated that civic engagement and social connectedness create better early years and schooling systems; faster economic development; lower crime and more effective government (Putnam 1995; Sylva et al., 2012; Getting it Right for Every Child Team (GIRFEC, 2017).

3.3.6 b Community Impact

The impact of the community on the development of concepts of school readiness in Ireland was identified in the National Evaluation of Concepts of School Readiness among Parents and Educators in Ireland (Ring et al., 2016). Consonant with the ecosystem suggested by Bronfenbrenner (1979), school readiness emerged as a multi-faceted concept influenced by, and located within the three overlapping spheres of influence in Figure 21.

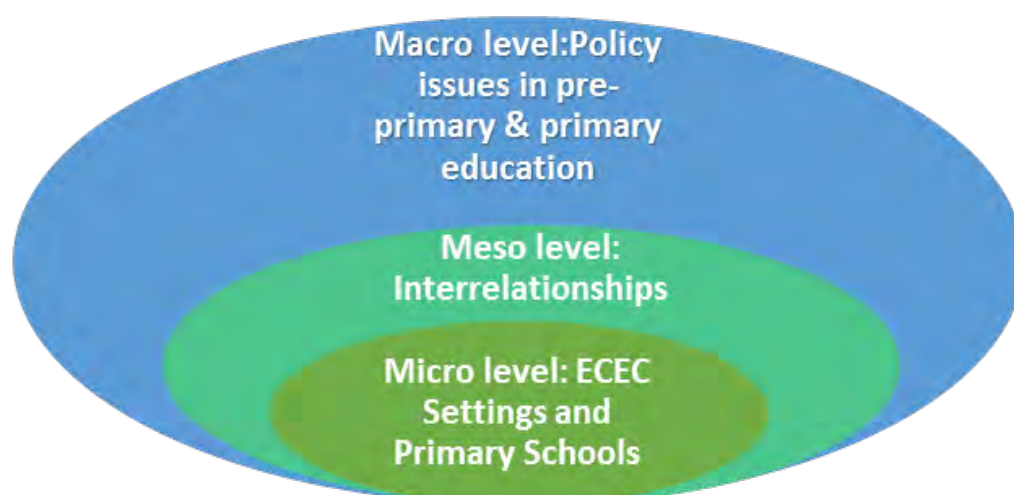


Figure 21. An Ecological Framework for School Readiness adapted from Ring et al. 2016

Policy-makers shape the rationale for school readiness at macro-level with the inter-relationships between home/community/early years and primary education shaping the experience of school readiness for all participants in the ecosystem. Libraries, and toddler groups and sports facilities were cited as key educational and recreational facilities within the community that contributed to supporting children in early learning and care settings. Support for children with additional needs in the community was particularly positive in terms of the range of multi-disciplinary professionals in the community supporting children's inclusion in ELC settings and their transition to primary school (Ring et al, 2016).

While the research identified positive practice in terms of children's early years experiences in Ireland, it also identified a trend whereby 'schoolification' and a downward extension of school led to a pre-occupation with early drilling in skills such as reading, writing and counting (Greenman, 2007; Ring et al., 2016; Ring and O'Sullivan, 2018). Developing a shared understanding between the child, family, community and setting in relation to the focus of ELC therefore has the potential to determine how a child's readiness for school is conceptualised, which is the ultimate determiner of the quality of the child's experience. Communities were identified by Sylva et al. (2012) in the findings from the Effective Pre-school, Primary and Secondary Education project (EPPSE 3-14) as having a potentially significant role in positively shaping children's development.

A central element of GIRFEC, the national policy in Scotland to secure the rights and wellbeing for children and young people, acknowledges the role and influence of the community in supporting children from the earliest stages (GIRFEC, 2017). The success of the model, in adopting a developmental and ecological approach to understanding children's lives that considers the impact of both family and community and involving children and families at each stage of the process, highlights the possibilities inherent in harnessing community involvement in ELC settings. The three main outcomes of inclusive ELC have been identified as: child belongingness; engagement and learning (European Agency for Special Needs and Inclusive Education (EASNIE) 2017a; 2017b). Surrounding the outcomes are the five major processes that the child is directly involved in ELC settings: positive interaction with adults and peers; involvement in play and other daily activities; child-centred learning; personalised assessments for learning and accommodation, adaptation and support (EASNIE, 2017). These processes are in turn reinforced by supportive structures within the ELC setting, which are further reinforced by supportive structures within the community and ultimately by supportive structures at regional/national levels. Community commitment is identified as one of the supportive structures within the community.

It is important therefore that children's early years experiences are located within the community and that ELC settings have visibility and their value acknowledged by their respective communities.

3.3.6c Community Involvement and the Irish Context

Children's connections with others in terms of relationships with parents, family and community and the adult's role, are among the twelve principles of Aistear: The Early Childhood Curriculum Framework (NCCA, 2009). The role of the community in children's lives in terms of displaying respect for childhood and the child's identity is expressly referred to in these principles. Community involvement suggests a range of possibilities from proactively seeking resources, amenities and opportunities readily available in the community to establishing networks and relationships with voluntary and statutory community organisations, health services, the county childcare committee or early years groups (Barnardos, 2017).

Community involvement has been identified as important for the child in terms of the impact the community has on the development of the child's sense of identity and belonging; richness of experience and view of the world (Barnardos, 2017). As demonstrated in Figure 22. and reflecting the ecological approach developed by Bronfenbrenner (1989), a child's development is reliant on both the formal and informal supports in the child's ecosystem.

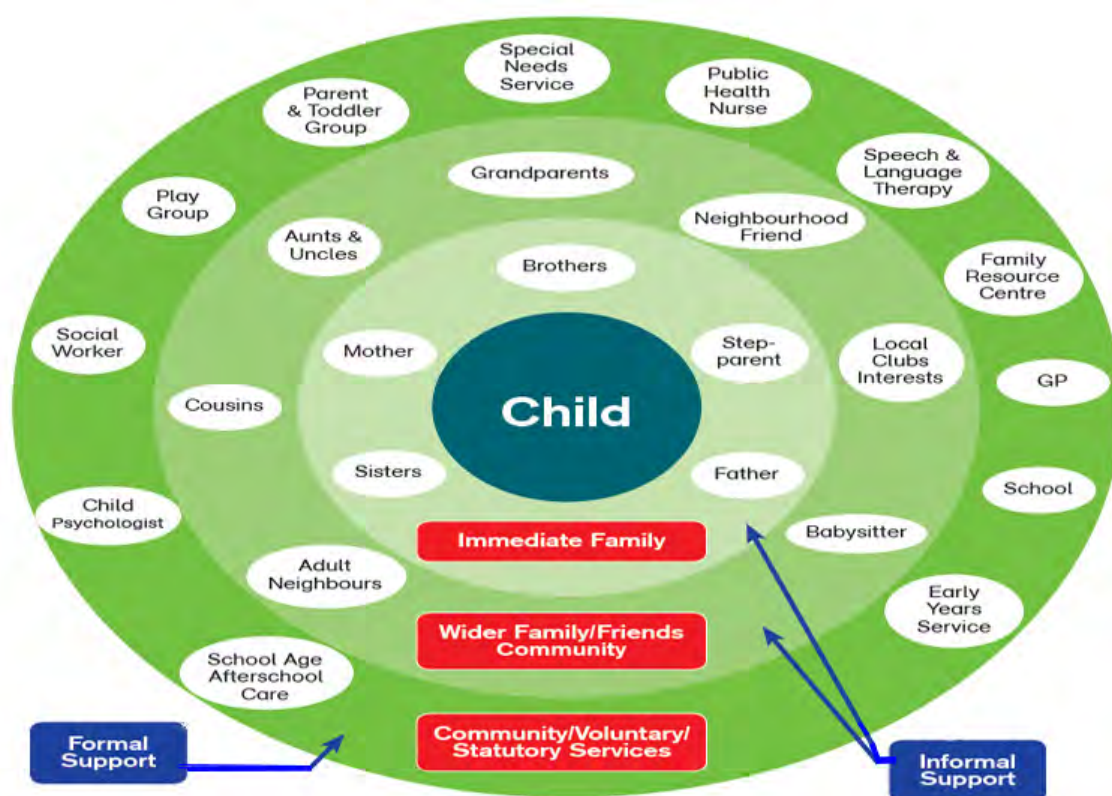


Figure 22. Children Sources of Support (Barnardos 2017: 3)

This desirability of ELC settings developing aspects of practice related to community involvement is acknowledged in the Child Care Act 1991 (Early Years Services) Regulations 2016 (DCYA 2016) and in the Early Years Education Focused Inspections (EYEI) (Department of Education and Skills 2018). The Child Care Act 1991 expressly refers to an outings policy; parental consent; risk assessment; planning and staffing ratios. The EYEI framework refers to signposts for practice that consider the extent to which a setting has made connections and is integrated with the local community and the extent to which children have developed an awareness of their local community and the roles of different people within the community. Connecting with the local community provides early years settings with a better understanding of the children and families with whom they work and allows them to provide relevant and meaningful experiential learning contexts with children (Barnardos, 2017).

3.3.6d Developing a Culture of Community Engagement

Touhill (2012, p1) observes that **“children thrive in an environment of mutually supportive and caring relationships,”** and therefore advises that developing a sense of community in early years settings is critical in optimising children’s identity; belonging; well-being and overall development. Nurturing a culture of community engagement importantly provides educators with a greater

understanding of the contexts in which children are connected. Acknowledging the many demands on ELC settings in terms of the availability of time, Touhill (2012) suggests that rather than viewing community engagement as requiring an ambitious project, it should instead be considered a part of everyday experience in the setting. Touhill (2012) reports on an initiative at Gamumbi Early Childhood Education Centre in New South Wales where the creation of an edible garden, linked to the philosophy of environment and sustainability at the setting, provided an opportunity to engage with families and the wider community. See photographs below from Touhill (2012, p3).



Figure 23. Edible Garden (Touhill 2012:3)

Informing the community about the setting and ensuring that the setting is visible in the community is a key principle of the philosophy and approach at Reggio Emilia and at San Miniato (Edwards et al. 2012, Fortunati, 2014). Practical strategies such as signage and flyers; linking with primary schools and parent/toddler groups and displaying children's artwork in public areas can contribute to raising the profile of the service and establishing the service as a resource and support in the community (Barnardos, 2017).

3.4 Limitations

The methodological approach adopted has fulfilled the aims of the project in producing evidence-based outcomes related to the development of **Universal Design Guidelines for Early Learning and Care settings**.

However, the project outcomes are compromised by a number of limitations, which should be considered in interpreting the project outcomes. The time-frame for the research placed a limit on both the scale of the literature review and the sample size. While a purposeful and targeted sampling frame was adopted, the sample size may not be representative of the overall target population and therefore may compromise the generalisability of the outcomes.

4 Universal Design Early Learning and Care Settings Creating an Inclusive Environment across the Spatial Scale



Figure 24. Ballinderreen Community Childcare and Education Centre, Ballinderreen, County Galway.

Universal Design is not just about access, but also about creating a more inclusive and learning-friendly environment in school. Schools that are built based on Universal Design principles will therefore be more effective because these schools will enable children to learn, develop, and participate, instead of “disable” children by creating barriers to their development and participation.” (UNESCO, 2009: 19).

4.1 Introduction

This chapter looks at the available literature regarding the design of early learning and care settings using the Universal Design (UD) approach. The aim of this review is to draw out some key design features and practices which can be used to inform the design of ELC settings in Ireland from a UD approach.

The analysis of the literature is informed by the three key domains of UD, namely: accessibility, understanding, and usability and how they are accomplished in the context of a UD ELC setting.

4.2 Literature Review Methodology

Using the same literature methodology outlined in Chapter 3, this current chapter represents a rigorous systematic literature review focusing on the built environment of ELC settings; rather than the key pedagogical and care issues.

Again, in line with Chapter 3, a two-strand approach was adopted, which included an empirical and an expert strand. The empirical strand comprised a systematic search of electronic databases and web searches related to peer-reviewed studies and the expert strand focused on accessing articles, reports, reviews and guidance based on expert opinion/professional experience related to early childhood education.

4.2.1 Empirical Strand

The literature review focused on identifying peer-reviewed publications published in English between 2008 and 2018, which were primary studies and or reports of Universal Design, Inclusive Design, and Design for All in early childhood education. A computer-based search, included searches of the following electronic databases: PsycINFO; Science Direct; Scopus; ERIC and ProQuest. In addition web searches were undertaken using Google Scholar, Education-line and OECD Education at a Glance. Where during searches, literature pre-2008 emerged and was deemed to be significant in the context of the project, this literature was reviewed.

4.2.2 Expert Strand

The literature review focused on identifying and accessing articles, reports, reviews and guidance based on expert opinion/professional experience published in English between 2008 and 2018. Web searches were undertaken using Google, Google Scholar, Education-line and OECD Education at a Glance. As with the empirical strand, where literature pre-2008 emerged during searches and was deemed to be significant in the context of the project, this literature was reviewed.

4.2.3 Literature Searching

Prior to commencing the literature search, search terms were developed to locate the documents relevant to both the empirical and expert strand. In relation to early childhood education, both in Ireland and internationally, a range of terminology is used interchangeably. Applying Boolean Operators [AND/OR/NOT], all of the search terms in Table 5. were used to locate the literature.

Table 5. Search Terms for the Literature Review

Terms relating to the setting
Early years settings
Early childhood settings
Early childhood care and education settings
Early childhood education and care settings
Pre-school settings
Pre-primary provision
Crèche
Childcare settings
Terms relating to design
Universal Design
Inclusive Design
Design for All
Accessible Design

The exclusion criteria identified in Table 6. were applied to both the Empirical and the Expert Strands, with reference to the scope, study-type and time and place.

Table 6. Exclusion Criteria

Scope	EC1	Not focused on early childhood settings
	EC2	Not related to accessibility; understanding; and usability (i.e. the core concern of UD, Inclusive Design, Design for All, or Accessible Design)
Study Type	EC3	Literature in empirical strand not empirically grounded
Time and Place	EC5	Literature from empirical strand and expert strand not within the specified time-frame (2008-2018)
		Not written in English

4.3 Synthesis of the Literature

The data extracted was organised as findings into categories relating to the following key spatial scales: (1) ELC setting site location, approach, entry and site layout(2), entering and moving about the ELC building, (3) key internal and external spaces, and (4) elements and systems.

4.4 Universal Design as a Continuum of Inclusive Spaces across Key Spatial Scale

The following sections investigate the sequence of spatial scales outlined above. However, it is also important to consider the ELC setting as whole and as a continuum of spaces that draws together the four distinct spatial scales outlined in the methodology above.

In this context, the Commission for Architects and the Built Environment (CABE) sets out its '10 criteria for successful school design' (CABE, 2011). While this is aimed at school design rather than ELC settings specifically, there are plenty of lessons to be learned. The criteria start at the broader community level and zones in gradually to interior design and the use of sustainable design strategies. CABE outline the following set of criteria that contribute to good school design:

- 1 Identity and context: making a school the students and community can be proud of.
- 2 Site plan: making the best use of the site.
- 3 School grounds: making assets of the outdoor spaces.
- 4 Organisation: creating a clear diagram for the buildings.
- 5 Buildings: making form, massing and appearance work together.
- 6 Interiors: creating excellent spaces for learning and teaching.
- 7 Resources: deploying convincing environmental strategies.
- 8 Feeling safe: creating a secure and welcoming place.
- 9 Long life, loose fit: creating a school that can adapt and evolve in the future.
- 10 Successful whole: making a design that works in the round.

Referring specifically to children with special needs or disabilities, the DCSF (2008) guidelines discussed in Chapter 2, outline a number of 'Inclusive Design' principles for schools that are relevant to the UD ELC setting. These include:

- Providing an accessible environment.
- Providing sufficient space for children with special needs or disabilities. This includes room for: safe vehicular movement and access; use and storage of specialist equipment and room for additional staff that may be required to work with these children.
- Careful design around sensory awareness that takes account of appropriate lighting levels, good acoustic qualities; visual contrast and texture and carefully controlled sensory environment to reduce negative stimuli and incorporate positive stimuli.
- An enhanced learning environment.
- Flexibility and adaptability.
- Supports health and well-being.
- Promotes safety and security.
- Achieves sustainability.

These inclusive design principles, along with the ten CAFE criteria outlined previously, consider the ELC setting in its totality. An integrated, coherent and child-centred environment is only possible when the setting is considered not only as set of spatial scales, but also in terms of connectivity and interaction between these scales. The overall structure and quality of the spaces within the setting determine this connection and interaction, and must be carefully designed to create and sustain an early years community. Reggio Emilia infant-toddler centres and preschools have developed their care and education model around what they call 'relational space' described as:

"an integrated space in which the qualities are not strictly aesthetic but are more closely related to performance features. This means that the space is not composed of functional zones but of the fluidization of functional zones. In the relational space, the predominant feature is that of the relationships it enables, the many specialized activities that can be carried out there, and the information and cultural filters that can be activated within the space."
(Ceppi and Zini, 1998)

The Reggio Emilia approach supports the idea of a setting as an integrated whole, composed of a spectrum of spaces running from large-scale, communal and social spaces, to small-scale and more intimate spaces for working in small groups or individually. While these spaces are well-defined, they are part of a connected whole seen as a "system of systems, a system of relationships, and communication among children, teachers, and parents."

This spatial structure facilitates mixed age groups or 'vertical grouping' common to both the Reggio Emilia and Montessori approach (Gordon and Browne, 2012). It also supports children's freedom of movement within an ELC setting,

an important spatial need for children according to Olds (2000) and one of Malaguzzi's three basic requirements in early childhood education that include movement, independence, and interaction (Gandini, 1998).

The early years environment as an integrated whole also supports the 'sense of place' and 'placemaking' central to Reggio Emilia settings. Investigating the intersection between the Reggio concept of the 'environment as third teacher' and children's understanding of place, Strong-Wilson et al (2007) point to place as a source of meaning, belonging, and identity. Referring to Ellis (2005), Strong-Wilson et al discuss how placemaking can support children's development in relation to community, positive identity, and successful learning. This is taken up by Reggio Emilia by making rich contexts that are enhanced by a 'recognizability' in the built environment created through a strong setting identity and sense of place (Ceppi and Zini, 1998).

The CABE criteria and the DCSF Inclusive Design principles discussed earlier, and particularly the Reggio Emilia approach outlined above, emphasise holistic, integrated and cohesive settings. These settings should create a strong sense of place, enable children's movement, play and social engagement, and supports social engagement for the entire setting.

4.5 ELC Setting Site Location, Approach, Entry and Site Layout

4.5.1 Site Location

The site of an ELC setting is dependent on a wide range of factors such as whether it is a home-based service or not; whether it has a rural, suburban, or urban location; the size of the service; availability of land or buildings, and a myriad other factors. However, in terms of urban or suburban settings the location of a setting, and its proximity to the community it serves, has implications for accessibility and sustainability as discussed below.

Supporting Compact Development and Sustainable Communities

Compact urban form is a key part of sustainable urban planning in Ireland and is supported by a range of Irish government policy and guidelines (DEHLG, 2007, DEHLG, 2009a, DEHLG, 2009b). The promotion of compact urban planning was reinforced by the publication of 'Project Ireland 2040 - National Planning Framework' where compact growth has been set out as one of the main National Strategic Outcomes:

"Carefully managing the sustainable growth of compact cities, towns and villages will add value and create more attractive places in which people can live and work." (Government of Ireland, 2018)

Reinforcing the desired outcome of compact growth, the framework supports:

“The provision of early childhood care and education (ECCE) facilities and new and refurbished schools on well-located sites within or close to existing built-up areas, that meet the diverse needs of local populations”.

Access and Proximity to Users

Good access to a range of quality childcare, education, and healthcare services is another of the National Strategic Outcomes. The availability and location of such social infrastructure is highlighted in the framework as:

“a defining characteristic of attractive, successful and competitive places. Compact, smart growth in urban areas and strong and stable rural communities will enable the enhanced and effective provision of a range of accessible services.”

This accessibility and integration of early learning and care within communities as a component of sustainable urban planning was already established by the 2001 Childcare Facilities, Guidelines for Planning Authorities (Government of Ireland). The guidelines support local authority decision-making around development plans and local area plans with respect to inclusion of childcare services. Promoting a range of issues including the need for diverse facilities in a variety of locations, or the role of childcare in disadvantaged areas, the guidelines also encourage local authorities to identify:

“...appropriate locations for the provision of childcare facilities including city centres, district centres, neighbourhood centres, residential areas, places of employment, and educational institutions and convenience to public transport nodes as a key element in the development of sustainable communities.”

Within **new and existing residential areas**, the guidelines recommend ELC facilities within the following sites or locations:

- Detached houses/sites or larger semi-detached properties with sufficient space for off-street parking, set-down areas, and external play areas. At least one facility with 20 places to be provided for every 75 dwelling units in new residential developments.
- Premises within neighbourhood centres where outdoor space can be provided. The facility should be able to avail of local parking and drop-off points associated with local shops or services or be close to public transport.

For industrial estates or employment areas ELC facilities should be located:

- Close to the estate entrance and any associated public transport.
- The site should have outdoor play space or easy access to outdoor areas.

Within city/town centres, district centres, and neighbourhood centres, facilities should be located:

- Close to public transport
- Within quieter, smaller streets as opposed to larger, heavily trafficked thoroughfares
- On sites with outdoor play space or easy access to outdoor areas/park
- Where parking and set-down areas are available
- Within existing retail units

Within education establishments such as third level colleges, secondary, and primary schools:

- Within third level campuses to accommodate staff and students
- Adjacent to schools to minimise travel and promote synergies such as afterschool care

For all the above, proximity to Public Transport Nodes is major factor as it may facilitate access and support sustainable travel patterns.

Integrating Children, Families and the Community

The Síolta standards regarding Parents and Families, and Community Involvement, as discussed in Section 3.3.2 and 3.3.6 respectively, highlight the intersection of home/family, community, and ELC settings or schools as an important part of a child's development. The location and integration of ELC settings within the community is critical to this intersection and will be supported if the setting is centrally located and there is good two-way access between the setting and the community.

In England, the location and integration of ELC settings within the community is addressed in the Sure Start design guidance where 'Involving the Community' is a key component. This document prepared by the Commission for Architecture and the Built Environment (CABE) and the Department for Children, Schools and Families (DCSF) argues that the building should be "well connected within its immediate neighbourhood. A location close to good public transport links will ensure that it is easy to reach, and clear signage is important, especially if a building is off the beaten track" (CABE and DCSF, 2008).

The 2017 Scottish 'Space to Grow' design guidance (Scottish Government, 2017) stresses the importance of accessibility for parents and children, and acknowledges the potential advantages of co-location with other educational facilities such as primary schools or third level institutions. It also states the "location should enable children to be an active part of the local community", and how connections could be forged with other parts of the community:

“...such care homes for older people where the intergenerational benefits to both the adults and the children could be enhanced in building positive and stimulating relationships. You should consider how the local community and surrounding area can provide positive learning experiences that have a positive impact on children’s health and wellbeing.”

The above policies, frameworks, and guidelines argue for compact urban form and the appropriate location of ELC facilities as a means to support inclusion and sustainable travel. However, unless the urban environment and transport links that connect people to these facilities are accessible, useable and easily understood, ELC settings will remain out of reach for many people with disabilities or older people who may be experiencing age-related difficulties or a cognitive impairment. In this context, Booklet 9 ‘Planning and Policy’, of the ‘Building for Everyone’ series (CEUD, 2014e) argues for the inclusion of Universal Design at every level of planning:

“Universal Design is not just about access to individual buildings, it is about how easily people can get around and to where they want to go. Key factors in creating an accessible environment are the location of services and of good transport links. Safe routes between key places that are designed to be easy to use by all individuals are another essential feature.”

This guidance introduces the concept of ‘Travel Chain Analysis’ to ensure that a person’s journey from their home to another destination is fully considered to eliminate barriers along the way that may hinder a person from reaching their destination in a safe and comfortable manner.



Figure 25. ELC setting in an urban location and in close proximity to residential areas and public transport.

It should be noted that the above literature largely refers to ELC facilities in urban or suburban areas and argue for the location and integration of settings within the communities they serve. In a rural area with dispersed patterns of settlement, the most appropriate location for an ELC setting will often be a rural or single house in the countryside as this may best serve the children, parents and families of the local area.

4.5.2 Site Approach and Entry

The environment that surrounds the ELC setting is critical to the UD approach. 'Building for Everyone - A Universal Design Approach' (BfE) booklets 1 and 9 (CEUD, 2014a, CEUD, 2014e) provide guidance regarding external environments that are relevant to this research.

Booklet 1 of the series is entitled 'External Environment and Approach' and deals with major design issues around topographical constraints, safety and convenience, and the balancing of various user needs in the external environment. Detailed guidance on both the pedestrian and vehicular environment is also provided, and is all highly applicable in the context of an ELC setting. Providing accessible, easily understood and usable approach routes and entry points is critical to a UD ELC setting. BfE Booklet 1 'External Environment and Approach' provides detailed guidance on pedestrian access routes, changes in level (i.e. ramps, steps etc), surface materials, street furniture, pedestrian crossing points, and tactile paving surfaces.

While good levels of artificial lighting are important on the approach and entry to any early learning and care facility, if an ELC setting has a community space or is providing extended services as discussed in Section 2.2, it may be open later in the evening or at night for community activities and as such would require lighting levels above those typically needed. Improved lighting, wayfinding, and signage will be a factor in the immediate environs as users arriving from the local area will comprise of a range of people, of various ages, and of diverse physical, sensory and cognitive abilities or size.

The 'Building for Everyone – A Universal Design Approach' Booklet 9 is entitled 'Planning and Policy' (CEUD, 2014b) and it discusses wayfinding and signage in the context of 'legibility', where legibility is described as "a design concept which makes it easier for people to work out where they are and where they are going." Physical characteristics of the landscape such as landmarks, distinctive natural features, and clear sightlines to destinations or wayfinding landmarks all serve to increase legibility. This can be supported by signage which is defined as "easily identifiable, clearly legible, distinguishable from its background and consistent in their design."

Vehicle traffic, public transport or cyclists in the immediate vicinity of an ELC setting may be entering, exiting or just passing by.

This mix of pedestrians (many quite young and thus more vulnerable), cyclists and motorised traffic creates a challenging environment, especially at times when students are going to and coming home from school.

A typical ELC setting will need a variety of vehicle movement and parking approaches depending on the specific context. This may require dropping-off or setting-down points for private vehicles, taxis, or public transport. Setting-down points should be located as close to the main ELC buildings as possible to allow a person with physical, sensory or cognitive disabilities to alight directly adjacent to their destination (CEUD, 2014a.p.34-36, CEUD, 2014e).

The boundary conditions of the ELC setting and how one enters or exits the setting is a key component on how it interacts with the local community, and how it provides a safe and secure environment for children. The CABE criterion for 'Site Plan: making the best use of the site' (CABE, 2008) contains a number of themes relevant to this aspect of the setting. The first theme focuses on 'Enhancing the Character of the Site' and raises questions around whether the scheme makes the most of its position and views, and how well it relates to buildings outside the site. In relation to the theme 'Strategic Site Organisation' the following issues are identified: creating identifiable boundaries and security zones; entrance sequences for different modes of transportation; and linking school entrance routes to local routes.

Fielding (2006) advocates for the integration of learning facilities with the local community and calls for these facilities to have permeable edges which allow greater interaction with the community. Specifically, Fielding states:

"Take down fences surrounding our schools. Within small learning communities, the sense of ownership and care of immediate surroundings associated with small learning communities provide greater security than a fence."

However, safety and security is a major concern for both ELC setting management and parents. Darmody et al (2010) address this security issue and point out that while many stakeholders they spoke to as part of their research were supportive of greater school-community interaction, they identified practical security problems around restricting access to certain parts of the school. In 2004 the Organization for Economic Cooperation and Development (henceforth referred to as OECD) document called 'Review of security in school design in Ireland' (Dolan, 2004), security is examined at both the building and site level, focusing on the following:

- **Location and surroundings.** Theoretically, a school located in a densely populated area that is unoccupied at night, weekends and holiday periods presents a higher risk than a school located in a suburb or rural area. In reality, schools are situated in the community they serve, and the availability of sites is often limited by factors such as poor town planning. Ideally, a school site should not be isolated and should be overseen by the local community.
- **Site boundary.** An effective site boundary is a critical component of school security and can relieve pressure from other areas. Although it is difficult to construct a perimeter that is physically impenetrable, socially acceptable and affordable, an appropriate site boundary should:
 - Be well-defined, prevent casual intrusion and make deliberate intrusion difficult and conspicuous.
 - Prevent access from inside and outside the site, so that it is as difficult for intruders to break in as to break out. Locks on gates should be located out of sight to deter vandalism.
 - Incorporate a symbolic barrier at road entrances to indicate private school grounds.
 - Not impede visual surveillance of the site, for example by using high walls instead of railing-type fences.

While it could be argued that the above recommendations may be too security focussed, it clearly illustrates the tensions between the open, community integrated ELC setting and the typical safety and security issues associated with a setting.

Perhaps a more balanced approach is presented in CABE's "10 criteria for successful school design" where the criterion - 'Feeling safe: creating a secure and welcoming place' – seeks to balance security and community integration (CABE, 2008). Rather than suggesting a high security approach through enclosure or protected boundaries, CABE asks whether there is a balance between the security strategy and openness; whether all users can access the site safely; and whether pedestrian routes are overlooked and safe at all times of the day. They highlight the importance of territoriality by asking if external routes and boundaries are clear and well defined and whether it is obvious which areas are open to the community and which are more private. It is suggested that the boundary treatment should facilitate the school's approach to security while entrances should be "welcoming for all users of the building, well-located and capable of passive surveillance".

4.5.3 Overall Site Layout

Strange and Banning (2001) refer to Miller and Banning (1992) and highlight four criteria for the design of positive educational environments, namely the “call for community, the call for territory, the call for landscape, and the call for wayfinding” (p.28). The sense of community is helped by gathering spaces, sitting areas and green spaces. Territory is about calling a place your own and is provided by distinct spaces, while landscape is helped by legibility (safety) and mystery (opportunity). At a more detailed level the presence of water features (Ulrich 1983) is often cited as a positive attribute of an ELC setting. In general, views to natural landscapes have shown to be beneficial to human health and well-being in various settings including hospitals and schools (Ulrich, 1984, Butterworth, 2000, CABE, 2002). A layout that promotes social spaces, personal spaces, and ‘third spaces’ (i.e. a hangout space) will contribute to good ELC setting design.

The CABE criterion for ‘Site Plan: making the best use of the site’ (CABE, 2008), also contains issues and questions relevant to the overall layout of the UD ELC setting. The first theme ‘Enhancing the character of the site’ poses a number of questions about the scheme such as: the design fostering a sense of place; the enhancement of the local topography, existing landscape features; and the micro-climate and ecology of the site. In this criterion CABE also highlight the importance of the design providing shelter from the prevailing wind, rain and sun while relating well to buildings outside the site.



Figure 26. Primary School setting illustration a good balance of pedestrian areas, planting and parking.

4.5.4 Site Circulation

The (Building for Everyone BfE) – A Universal Design Approach’ Booklet 1: ‘External environment and approach’ and Booklet 9: ‘Planning and policy’ (CEUD, 2014a, CEUD, 2014e) contain much guidance regarding the UD approach for the external environment. Specific issues regarding children include guidance around external guardrails and advice that they should be designed “so that people with a lower eye level, including children, people of smaller stature, and wheelchair users, can see and be seen through the railings, and to prevent assistance dogs from walking underneath.” Regarding handrails, this document recommends “where a second lower handrail is provided, the diameter may be 25 to 32mm in recognition that it is likely to be used predominantly by children and that a smaller profile will make it easier to grip”.

BfE Booklet 2: ‘Entrances and horizontal circulation’ also describes the UD approach to the external entrance of a building this will give some additional guidance to the external circulation areas directly adjacent to an individual building.

The 2012 NDA document titled ‘Improving the Accessibility of School Buildings’ provides guidance regarding the physical environment of primary and post-primary school buildings and grounds, so they are easy for everyone to use, including students with disabilities. While this document does not specifically relate to early learning and care settings, they nonetheless, provide relevant information for the design of a UD ELC setting.

They highlight how a school will be extremely busy at drop-off and pick-up times and how traffic can be a hazard for many children and people with cognitive or sensory impairments. In this context the NDA prescribes the following:

- Designated pedestrian routes should be clearly separated from vehicular circulation.
- Where parents’ cars enter the school grounds, vehicular circulation routes should provide for appropriate speed limits and set-down areas designed to avoid congestion, for instance by using a one-way system.
- Appropriate signage to clearly designate entrances, drop off areas, and traffic flow.
- Designated accessible parking bays and drop-off areas should be provided close to the school entrance for students and staff.
- The provision of a dedicated shelter at the accessible parking spaces or designated set-down points to provide shelter from the weather is a desirable feature.

In addition, the NDA argue that all external circulation routes within the school site should provide accessible, safe routes with a choice of ramps and steps, and adequate space for people to walk side-by-side, whether on foot or in a wheelchair. While these points relate to a school site, the same consideration can be given to the ELC setting site.

The DES 'General Design Guidelines for Schools (Primary & Post-primary)' TGD -020 (Department of Education and Skills (IRL), 2011) builds in universal access into the design philosophy and states that "provision should be made for disabled access from the site perimeter to the school, with universal access routes to all main building entrances" While this document refers to school going children, there are plenty of lessons for a UD ELC setting.

As discussed previously, the CABA criteria for successful school design (CABA, 2008) contain many issues relating to external circulation and school grounds. Many of these have been referred to in the earlier sections but some, which relate directly to external circulation areas, are worth highlighting. CABA discuss the need for clear external circulation areas which balance the needs of different users; provide safe on-site pedestrian routes; and present a clear external circulation diagram. They also highlight the need to plan for deliveries and refuse collection; provide all year round routes to sports facilities; create unobtrusive car parking; and, provide circulation routes that avoid disruption to learning spaces.

Many of the CABA criteria referred to above and detailed elsewhere in this report adopt an approach very similar to UD. Across all 10 criteria the CABA guidance demonstrates an inclusive, multi-faceted concern with design quality, which not only supports educational goals, but does so in a holistic, child and community-centred manner that seeks to fully integrate all uses and users on the school grounds.

4.5.5 Key External Spaces – Outdoor education, Social and Play Spaces

The third CABA criterion for successful school design 'School grounds: making assets of the outdoor spaces' (CABA, 2008) contains a theme which focuses on the 'Relationship between the grounds and the buildings.' This theme contains issues which focus on:

- creating a sense of place using the grounds and planting
- the relationship between exterior spaces and the building form
- the enhancement of micro climate
- the creation of views to the surrounding landscape.

CABA recommend a rich sensory environment which creates shelter and contributes to the overall sustainable strategy for the site.

Another theme within the criteria aims to support 'social spaces and play' and CABE advocate that safe outdoor space should provide for:

- a variety of different student social activities, interest ranges and group sizes
- should allow imaginative and creative play
- facilitate both informal and formal outdoor dining.

'Outdoor learning' is included as part of this third criterion – i.e. 'School grounds: making assets of the outdoor spaces' - and CABE challenge designers to design space that supports the curriculum and the school's pedagogy. Links between the indoor and outdoor learning environments are encouraged while the growing of food on the school grounds is promoted.

In terms of 'physical activity' CABE pose questions around the provision of appropriate sports pitches, the opportunities for winter activities, and the integration of sports facilities into the landscape strategy. It is also questioned whether these facilities are available to the wider community or whether other local facilities are being considered for use.



Figure 27. Outdoor play area in an ELC setting with adventure and positive risk. Giggles Playschool, Newbridge, County Kildare.

CABE ask an interesting question regarding how the school provides "opportunities for challenge and risk taking in the grounds." This whole area of risk and the design of public places has been examined by CABE in another report (CABE, 2007) and they found that often 'risk aversion' based on fears rather than evidence has a negative impact on the quality of the built environment. This is reinforced by Gleeson and Sipe (2006) who discuss child-friendly cities and refer to 'bubble wrap generation' or the 'pampered prisoners' arguing that many children are being deprived of recreation and self-expression due to increased parental anxiety and control.

In terms of key spaces, The CEUD at the NDA series of booklets 'Building for Everyone – A Universal Design Approach' (BfE), Booklet 7 titled 'Building Types' provides guidance for parks, gardens and courtyards. A well designed UD ELC setting will contain a range of communal, age specific and more intimate spaces. According to BfE Booklet 7: Building Types, "gardens and courtyards should provide relief from the activities taking place in the adjacent spaces. Changes in light and shade, the sound of water, and landscape features that stimulate the senses should be included, especially in terms of people with various sensory or cognitive impairments". Trees, shrubs and planting can be used to soften the acoustic environment, which is of particular relevance in ELC settings, as young children naturally create a high level of sounds. This should be carefully considered where classrooms open onto a courtyard, and in an environment where certain people such as those on the autistic spectrum may experience sensory hypersensitivity (see Section 2.3.2). To deal with this the AusAID (2013:80) guidance suggests that designers should:

"locate quiet classrooms and reading rooms away from noisy activities such as music classes, physical education activities, playgrounds and workshops (if unavoidable, install a sound barrier or orient windows and doors so they do not open directly into the noise source)"

These spaces should be designed and maintained to support maximum biodiversity which can be used as learning support spaces for the students. Food-growing should be considered, including means through which it can be incorporated into the curriculum or extra-curriculum activities. As mentioned earlier, direct views to natural features, such as trees, plants, the sky, among others, can have a soothing effect on building occupants and direct views and contact between the interior spaces and the exterior should be accounted for.

Careful consideration must be given to circulation areas and other surfaces to ensure they are accessible and usable by all people, while good wayfinding and signage should be adopted for legibility and orientation. Raised plant beds provide better access to people using wheelchairs, people of small stature, or those with restricted mobility, and can be used not only to allow direct access to planting to enhance sensory and tactile experiences, but also to allow people to work on the raised beds, for recreational and/or educational purposes.

Playgrounds, play structures and equipment are also covered in BfE Booklet 7: Building Types, emphasising the important role of play in social, physical and emotional development. These spaces should encourage adventure, curiosity and play; furthermore, the spaces should present a challenge through activities which cater to a range of abilities.

Darmody et al (2010) point out that while little research has been conducted into outdoor spaces in schools there is still research (Hayhow, 1995; Tanner, 2000) that illustrates how external space can contribute to learning and socialisation across diverse ages and abilities. They also refer to Carty (2007) who contends that children perceive spaces as play spaces when they themselves are the main

users, while classrooms are seen as work spaces because they are controlled by teachers. Darmody et al (2010) recommend the following:

- Outdoor spaces with a variety of surfaces (including soft non-grass surfaces, especially for younger children)
- A school garden and other habitats to be included in the landscaping of the site
- A variety of playground and sports equipment to cater for the needs of different pupil groups
- Principals and teachers should be encouraged through professional development to use outdoor space as a learning zone.

Rudd (2008) argues for a more holistic approach to play spaces where collaboration with the local community creates spaces that are mutually beneficial to both. He points to the UK 'Best Play' guide which was created by Fields in Trust (FIT) (formerly the National Playing Fields Association [NPFA]), along with PLAYLINK and the Children's Play Council, which has the following objectives.

The provision:

- extends the choice and control children have over their play, the freedom they enjoy and the satisfaction they gain from it.
- recognises the child's need to test boundaries and responds positively to that need.
- manages the balance between the need to offer risk and the need to keep children safe from harm.
- maximises the range of play opportunities.
- fosters independence and self-esteem.
- fosters children's respect for others and offers opportunities for social interaction.
- fosters the child's well-being, healthy growth and development, knowledge and understanding, creativity and capacity to learn (p.28).

The advice offered above helps in creating a more child-friendly environment but in the context of the ELC setting, these child friendly spaces will also need to take into account children with special needs.

The Department of Education and Skills (DES) 'Planning & Design Guidelines Primary & Post Primary School Specialist Accommodation for Pupils with Special Educational Needs' (Department of Education and Skills (IRL), 2012) provides guidance for the design of SEN facilities as part of a mainstream school. It acknowledges the challenges around designing environments that will suit both mainstream and SEN students. For example:

"the design of learning spaces in educational buildings should stimulate pupils. However consideration needs to be given to pupils with special educational needs who may also have sensory sensitivities. Some pupils with Autistic Spectrum Disorders (ASDs) may display extreme sensitivity to sensory stimulation, for example, sound, light, colour, smell and pattern."

This integration demands a thorough consideration of many location, planning and design issues, including but not limited to, for example, the avoidance of locations with rivers or ponds that might be particularly dangerous for pupils with special educational needs who may not be aware of such hazards. External play areas should ideally be close to and directly accessible from the SEN classroom and contain both hard and soft play sections. The needs of students with photophobia should be considered by providing shaded outdoor areas and the avoidance of playground surfaces that contain highly reflective particles. A quiet area may be required for vulnerable students while the yard should provide no hidden areas where SEN students can be out of view. The boundaries of the play area should be secured using 1.8 m high fencing which includes gates with tamperproof latches.

The guidance from DES suggests that water and electrical services should be provided for a water feature while a wheelchair accessible sensory garden should be provided within the secure play area if possible. On the latter point, the DES guidelines state the following:

“A sensory garden stimulates the senses. Hard and soft landscaping – fountains, raised wheelchair accessible planted beds, pergolas (climb-proof), wind chimes, foot chimes, bird tables, etc., can be used in a variety of ways to provide experiences involving seeing, smelling, hearing, and touching. Pupils should be encouraged to interact with the plants, touching and smelling them. Space to sit down, picnic, watch wildlife, listen to sounds, etc should be considered within the layout” (p.13).



Figure 28. Natural landscaping enhancing an ELC setting. Ballinderreen Community Childcare and Education, Ballinderreen, County Galway.

Notwithstanding the need to protect certain children with special needs who may be more vulnerable to the 'rough and tumble' of typical child's play, there is still a need to strive towards greater integration of all children in the ELC setting as a way to break down barriers. As discussed in Section 3.3, Edwards (2006) research into the 'Sharing Spaces Project' demonstrated the link between improved school grounds and improved student welfare and co-operation in the school grounds. Improving co-operation between all students regardless of age, size or ability, is critical to achieving greater student integration. There is some evidence that the pupil-centred design process experienced in the 'Sharing Spaces Project' resulted in improved social and behavioural conditions in the school grounds. It is therefore reasonable to assume that such a process may be helpful for empowering students and designing for greater integration among all students in the ELC context.

4.5.7 Approach spaces to Building

Various ELC setting design guidance (NCNA, 2002, CABE and DCSF, 2008, Scottish Government, 2017) propose external buggy storage areas adjacent to or near the main entrance to the building. Additionally, the NCNA (2002) suggest that an outdoor covered area at the entrance with seating could be used as a waiting area for parents or guardians if the space is not available internally. Such a space could also benefit those who would prefer to wait outside or cater to a person accompanying the parent or guardian.



Figure 29. Approach to an ELC setting illustrating a good relationship with the adjacent community. Busy Kids Childcare, Lucan, County Dublin.

4.6 Entering and moving around the ELC Building

Section 4.4 discussed the setting as an integrated whole that supports physical movement, social interaction, a sense of place. When considering how all users enter and circulate within the building, it is important to remember these environmental characteristics. Circulation space within an ELC setting is much more than a link from A to B, it is a critical part of the child's everyday experience and provides a range of relational and developmental opportunities. For instance the Reggio Emilia approach avoids spaces that are "separated by corridors or isolated walkways," (Rinaldi, 1998) while the DCSF (2008) emphasise the social and developmental role of circulation space, pointing for instance to the value of children climbing stairs as part of the learning process.

4.6.1 Entering the Building

The CABE and DCSF (2008) and the Scottish Government (2017) design guidance both identify the ELC building entry as a key component in the environment. Creating a sense of arrival that is welcoming and accessible is important for all users, furthermore, it is argued that an aesthetically pleasing entrance will encourage a child inside and help create a sense of belonging.

The above guidance, and the DfCSF (2008) and NDA (2012) guidelines highlight the importance of being able to see and recognise the school entrance from a distance. They also recommend:

- A level threshold with a safe, level drop-off zone that has, ideally, only shallow gradient ramps.
- A canopy or covered access to the pavement for children transferring to or from buses or taxis (without being a hazard in the route).
- Sheltered, accessible waiting spaces - for parents with other children, if appropriate, and for children with SEN and disabilities to wait for assistance - with a visible, easily operated entry phone or intercom to reception.
- Well illuminated entrance area to insure it is safe and usable in low-lighting or darker conditions.
- Easily operated doors, such as automatically operated sliding doors, with appropriate fail safe mechanisms, and in a safe and secure position.
- Doors that are sufficiently wide to facilitate large buggies and wheelchairs.
- Glazed door panels for visibility.
- Bell entry system, keypad entry, and video security to allow remote monitoring of entrance.
- A good visual link between inside and outside, so that reception staff can oversee and supervise easily (CCTV cameras should be discreet and not detract from the welcome or reduce accessibility).

In new buildings in Ireland, all entrances to schools must be designed to comply with Part M of The Building Regulations, 1997-2010 and must be accessible. However, it must be noted that entrances to some existing ELC settings are not currently fully accessible due to inadequate door width or stepped thresholds.



Figure 30. Entrance areas and main entrance doors to an ELC setting.
Ballinderreen Community Childcare and Education, Ballinderreen, County Galway.

4.6.2 Horizontal Circulation

BfE Booklet 2 Entrances and Horizontal Circulation (CEUD/NDA 2012) contains guidance regarding entrances, horizontal circulation (corridors and internal lobbies), and entrance and internal doors. Secure building entrances are discussed, saying that where an entrance door requires security, it should still be accessible. This is relevant to an ELC setting, where the safety and security of children is a key concern. Booklet 2 states that “where child safety is a concern, it may be acceptable to locate the handles higher, out of the reach of children.”

The booklet also recommends that “the overall arrangement of access routes should be logical, understandable, useable, and as direct as possible in terms of providing access to key facilities”. This is particularly relevant to settings for young children, while also important for visiting family members, people with visual or cognitive impairments, or people unfamiliar with the environment.

The NDA document 'Improving the Accessibility of School Buildings' (NDA, 2012) provides some guidance regarding corridors. It states that where feasible, schools should minimise long travel distances, and that all circulation routes should be wide enough for two wheelchairs to pass one another – a minimum clear width of 2400 mm is preferable.



Figure 31. Entrance area an ELC showing a bright and welcoming space. Ballinderreen Community Creche, Ballinderreen, County Galway.

This document suggests the provision of handrails on long corridors, with handrail heights to suit both students and adults. Good levels of natural light and ventilation will support a comfortable environment in circulation areas.

Internal doors – BfE Booklet 2 recommends that 'doors opening into a room should be hung so that they open against an adjoining wall'. This can be helpful within an ELC setting as doors that open against the wall into various rooms give an immediate view of the room and its contents and provide good observation for staff and good visual cues for children as to the room's function. Electromagnetic hold-open devices, which enable doors to be held open in a fixed position, whilst generally used to allow unobstructed or easier and useable access through a building (CEUD/NDA, 2012), can be used to give direct visual access to a room.

4.6.3 Vertical Circulation

BfE Booklet 3 Vertical Circulation (CEUD/NDA, 2012), concentrates on the Universal Design of internal stairs, internal ramps, and various kinds of passenger lifts. As described in Section 4.6, issues around guarding height and the provision of secondary/lower level handrails should be considered.

Internal Stairs – the BfE Booklet 3 points out, safety is of paramount importance when considering vertical circulation in a building and stairs. The clear guidance given in booklet 3 on the design and dimensions of internal stairs is therefore important. In addition to this guidance, contrasting colours between the steps of the staircase and the staircase frame and walls can help a person with visual or cognitive impairments to identify steps and changes in level or gradient, thereby simplifying the visual environment. This is beneficial for older caregivers with age-related vision difficulties. Lighting is very important on internal stairs so that they can be used safely at all times.

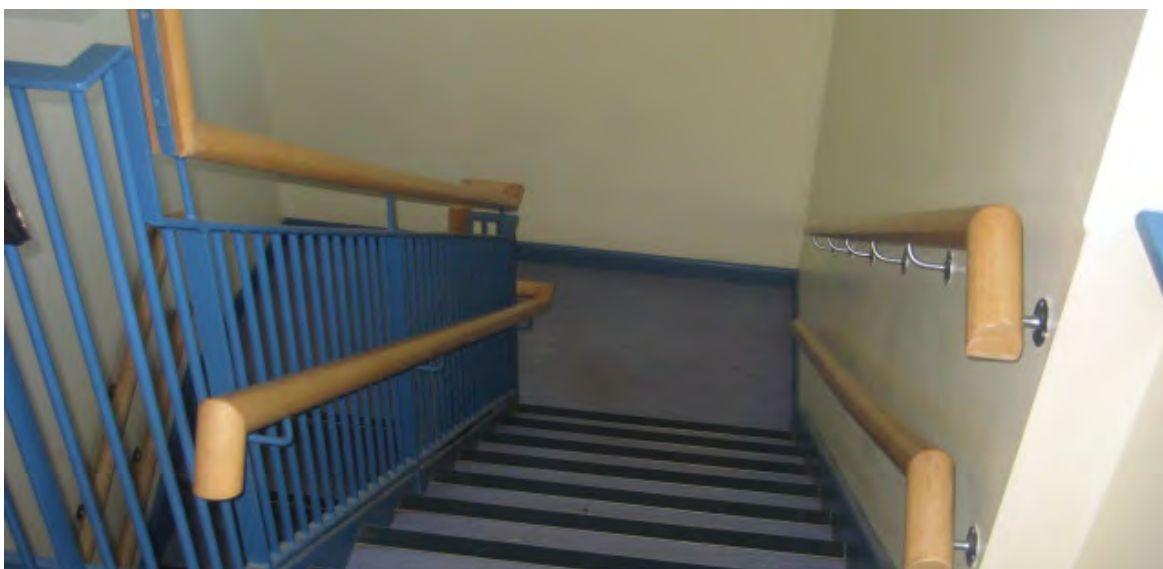


Figure 32. Stairs in ELC setting showing standard height and lower level handrails. Tigers Childcare, Balgriffin, Dublin.

Hazard-warning surfaces which provide high visual and tactile contrast, as referred to in the BfE Booklet 3: may be disorientating for a person with a cognitive impairment and should be avoided. For example, a sharp contrast in flooring colour can be perceived as a step or hole by the people who may be prone to panic and have perceptual problems. The latter may place the person more at risk of a fall inside the ELC setting.

Where users of an ELC setting have mobility or visual difficulties, handrails or grab bars can support safe mobility around the building. BfE Booklet 3 provides guidance for the provision of handrails, and of particular importance is the recommendation that handrails should contrast in colour to the background with walls. This is so they are clearly visible and thus enable the person living with a cognitive or visual impairment to easily see them.

Lifts - The provision of lifts as well as stairs between floors in multi-storey schools is of particular importance for wheelchair users and people with reduced mobility. While young children in an ELC setting will not be travelling in a lift without an adult, school-age children should be able to do so independently. It is important that any access control system can be used by everybody. With regards to safety and security surrounding lifts, the 2012 NDA guidelines point out that there are various access control systems available than can restrict access to a lift, such as contactless smart cards.

4.7 Key Internal and associated External Spaces

A typical ELC setting will contain a wide range of internal and external spaces. Internally these include entrance halls and reception areas, staff offices, family rooms, toilets, and an array of children's rooms and spaces, rooms for school-age children from primary school children up to 14 years. The BfE Booklets 2 to 8 (CEUD/NDA, 2012) provide relevant guidance for all these spaces.

As discussed in previous sections, it is important to consider how these spaces are connected and integrated as opposed to seeing them as sharply separate or differentiated spaces. Do these spaces support mixed age groups? Do they enable children to move around the setting, bearing in mind issues around safety and security?

4.7.1 Entrance Lobby and Reception

The 'Improving the Accessibility of School Buildings' guidance (NDA, 2012) identifies the need for adequate space for people (including those in wheelchairs) to gather inside the building at arrival and departure times. These spaces must avoid congestion and create a calm and safe environment during these periods because this can be a particularly stressful time for some children.

The DfCSF (2008) provide specific school setting recommendations as follows:

- The reception space should be attractive, friendly and welcoming, with a secure, draught-free, convenient and welcoming lobby, with outer and inner doors and security controls, giving reception staff better access control.
- An easily identifiable reception counter, ideally facing onto the secure lobby, with a sliding window or glazed screen at an accessible height, a lower section and knee recess for wheelchair users, and a hearing loop.
- Waiting and seating areas with sufficient space for wheelchair users or people with buggies.
- Visual and/or tactile signage, sited where users can take time to read it.
- Appropriate good quality lighting: the entrance/reception can offer a transition lighting zone where people with visual impairments can adjust between a bright exterior and a subdued interior - the receptionist's face should be clearly visible, avoiding down-lighting that casts shadows on the face of the receptionist or visitor.

- Well organised display of children’s work to promote a sense of achievement and belonging (without impeding circulation, causing hazards or obstructing lighting).
- Safe storage of personal belongings and mobility equipment, with battery charging close by, so there can be easy transition between equipment from home and school.
- Accessible toilet(s)/changing room signposted nearby a parents’ room (often) located nearby.

4.7.2 Shared Central Spaces

In larger settings with multiple rooms a central shared area may help tie the setting together and provide an area for communal events. The Scottish Government (2017) highlight how a central space can become the ‘social heart’ of a setting, while CABE and DCSF (2008) point out how flexible spaces and moveable partitions can help integrate spaces and create larger shared areas where required.

This kind of social centre is a key part of the Reggio Emilia approach (previously discussed in Section 3). Referred to as the ‘Central Piazza’, it provides a shared central space that forms a nexus between all the key rooms and acts as a “place of meeting, a public place of the school which plays the same role in the school building as the piazza does in the town” (Ceppi and Zini, 1998). These ‘piazas’ are one of the main “relational forms” within Reggio Emilia settings which “supports the formation of relationships, symbolizing the “pedagogy of relationships” in the sense that it fosters encounters, group interaction, stories, social relations, and the children’s assumption of a public identity.”



Figure 33. Shared central area within a ELC setting. Tigers Childcare, Blanchardstown, Dublin 15.

4.7.3 Children's Eating Areas

In some ELC settings the main children's room will be used for eating and snacks while in other settings a shared or communal space may be used. In larger settings there may be a dedicated dining or eating area. This may be part of a kitchen, consisting of an area fitted with a kitchenette for the preparation of snacks or the 'plating out' of pre-prepared food and an area where children and ELC practitioners have snacks and meals. The kitchen and dining areas would be divided by a counter so children do not have access to the kitchen area when meals are being prepared.

According to the Scottish Government (2017) children should be involved in the preparation of food and snacks, and encourage the provision of suitable spaces and facilities. This is discussed in Section 3.3.3a, which looks at how settings can promote 'emotional warmth and security' through the provision of more home-like spaces like kitchens and dining rooms, and support engagement with routine activities such as mealtimes.

These concerns pose questions in relation to the layout and design of a setting. Should the setting contain an integrated kitchen/dining room? For instance, where should the children sit during mealtimes and what kind of furniture should be provided?

4.7.4 Main Children's Rooms

4.7.4a Space for movement, discovery and play

ELC settings design guidance (NCNA, 2002, CABE and DCSF, 2008, Scottish Government, 2017) all emphasise how children need a variety of spaces throughout the day, but they should be able to clearly identify one space as their base and instil a sense of belonging. This is linked with the concept of 'recognisability' as espoused in the Reggio Emilia approach, where 'architectural language and environmental atmosphere' is used to create a precise identity.

According to these guidelines, children's spaces must support play and children's uninhibited movement to designated areas such as messy play areas, or quiet restful areas. CABE and DCSF (2008) highlight the importance of 'dens' as hideaways that act as "...secret spaces that allow children to create and inhabit their own imaginary worlds. They provide safe environments in which they can challenge themselves, both mentally and physically." Overall an ELC environment must be interesting, varied, and support discovery and investigation.

"Successful architecture for pre-school children must include changes of space, shape, height, texture, colour and, most important, natural light and fresh air. The planning of the childcare facility is a key element and must incorporate different shapes or rooms for different activities. Include design concepts such as round rooms, semi-circular bay areas or other unusually shaped interior spaces. The interior vision must never end and should merge into various future stages of play and education" (NCNA, 2002).

Returning to the Reggio Emilia concept of relational space and relational forms (Ceppi and Zini, 1998), the relationship between inside and outside is an important aspect of the Reggio Emilia ethos. This plays an important role in terms of movement, play and discovery and is promoted by CAGE and DCSF (2008) who advocate 'run-in, run-out play' through the interlinking of indoor and outdoor spaces. This is echoed in other childcare guidance (NCNA, 2002, Scottish Government, 2017) and will be discussed further in Section 5.7.5 External Children's Spaces.



Figure 34. ELC setting with open plan arrangement allowing children to freely move around. Pinocchio Infant-Toddler Centre, San Miniato, Italy.

4.7.4b The need for challenge and sensory stimulation

The need for challenge and learning provocations was discussed in Section 3. This is reiterated by the NCNA (2002) in a chapter titled 'The World is not Flat'. This guideline recommends that spaces should be divided vertically and horizontally to facilitate:

- level changes.
- nooks and crannies.
- areas of differing scale.
- opportunities for a range of sensory stimulation.

Challenge is a key outcome of outdoor play and a healthy relationship between inside and outside is discussed above in Section 5.7.3 A. This will be examined further in Section 5.7.5.

Children explore and interpret their world through their senses and therefore many design guidelines emphasise the need for sensory and tactile finishes and materials to create a stimulating multisensory environment (Ceppi and Zini, 1998, Scottish Government, 2017). In this context the NCNA (2002) argues that settings should “allow children to feel the texture of running water, taste herbs, enjoy the patterns of the sun, listen to the birds or soft music, or observe the changes in nature”.

4.7.4c **Common design features applicable to multiple age-groups**

Many smaller ELC settings will contain one shared dedicated children’s space and therefore this space must be varied and flexible enough for the range of age groups that attend. Larger settings will typically have specific rooms or separate units dedicated to particular age groups who use the space at any one time. However, the use of each space may not be fixed throughout the week, or even the day, and it may be used by different age groups at different times. Therefore, many settings will either require flexible and adaptable spaces suitable for mixed age groups, or the flexibility to cater to number of different age-groups throughout the day/week/year as needs dictate.

Some settings provide for children to move between spaces with a certain amount of freedom where appropriate, depending on the age-groups catered for and the management ethos. The Scottish Government (2017) highlight how Reggio Emilia settings contain connected spaces where children can move freely. This is important as it enables children of mixed ages to play together and supports siblings to see each other during the day.

In this context there are number of design features and qualities that are applicable to most young children. The 2002 *We like this place*, Guidelines for Best Practice in the Design of Childcare facilities (NCNA, 2002) outlines a number of these as follows:

- High levels of natural light and the provision of low-level sills or floor-length windows to maximise views to the outside and support visual development (a sill of 300mm provides a nice place for a small child to sit).
 - Toilet facility attached to each unit and easily accessed from the main activity or play space.
 - Sufficient storage space within the room.
 - Room flexibility through moveable elements to define different spaces.
 - Good levels of staff supervision.
 - Child level shelving and storage units.
 - Direct access to outdoor areas.
- (NCNA, 2002)

4.7.4d **Specific design features for children under 12 months**

In terms of specific design features for infants the NCNA (2002) outline the following:

- Free space for crawling.
- Infant level shelving units or storage to allow retrieval of toys and support a child's efforts to pull themselves up to a standing position.
- Low level glazing and partitions to aid supervision.
- Low level mirrors to support visual development.
- Sound absorbing materials that are non-allergic, anti-static, and stain/moisture resistant.
- Direct access to the nappy changing area.
- A milk kitchen with sink, fridge and storage areas (this may be located in main kitchen depending on the size of the setting).
- A small covered outdoor space that is separate but adjacent to the main outdoor area will ensure that infants get fresh air and a change of scene in a safe and sheltered location that still provides contact and visual access to the older children at play.

4.7.4e **Design features for children between 1 and 2 years**

In terms of specific design features for children aged 1 to 2 years the NCNA (2002) outline the following:

- Safe floor surface and room layout to support children at this stage of development who are prone to falls and spillages.
- Spaces to allow clear running areas.
- Spaces and age-appropriate levels to develop gross motor skills.
- Cloaks and storage areas at an accessible level to help them recognise their belongings and encourage independence.
- Access to level changes, small ramps etc.
- Toddler level shelving units or storage to allow retrieval of toys and support a child's efforts to pull themselves up to a standing position.
- Enough space for more than one child in any designated area.
- Low level mirrors to support visual development.
- A milk kitchen with sink, fridge and storage areas (this may be located in main kitchen depending on the size of the setting).
- Direct access to nappy changing area.

4.7.4f **Design features for children aged 2 to 3 years and 3 to 5 years**

While there is quite a difference in developmental stages between a 2 year old and a 5 year old, there is significant overlap in the design features appropriate for these age-groups. According to the NCNA (2002) the common design features required for these age groups include:

- The room plan should guide a child from one activity to the next.
- Separate quiet/noisy, tidy/messy, and active/calm spaces (including nooks and crannies).
- Sink provided adjacent to messy areas.
- Floor surfaces to reflect activity (waterproof for messy, calm or cosy for quiet area etc).
- Toilet, potty training, or nappy changing directly accessed from the play room, that balances supervision with privacy for the child.

4.7.4g **Design features for school-age children (5 to 14 years)**

Considering the potential age range within the school-age group, careful design and flexible environments are required to support different developmental stages. In this regard, the NCNA (2002) suggest the following:

- Careful location within the setting to provide a bit more independence, space to relax, and take part in activities or social engagement. This could be located on an upper floor.
- Where possible a separate entrance and dedicated access route to the school-age children's room is preferred.
- Create a distinct identity for the school-age group to distinguish it from the ELC setting.
- Provide access to a kitchen for cooking/baking and facilities to prepare a snack or drink.
- Provide dedicated toilets for this older age group.
- Dedicated outdoor space that reflects the competency of older children and the higher level of risk associated with play. Factor in skateboards, scooters and bicycles.

4.7.4h **Sleep areas**

Separate sleep areas are a requirement for children under the age of 2 years and these should be adjacent to the main room (NCNA, 2002) and be provided as follows:

- The size of the room is dictated by the number of cots required to serve the children in the main infant or junior toddler space, however a max of 6 cots is recommended. A standard cot is 1140mm x 550mm and requires 700mm clearance on at least 3 sides. Cots should not be placed against windows, radiators, or beside doors, this will impact overall floor space requirements.
- Sleep rooms should have space to store additional mattresses.
- Temperature range must be kept within 16-20 °C and receive 3 air changes per hour.

4.7.4i **Design features for children with additional needs**

The DCSF (2008) point out that some children will need additional space for circulation and for specialist staff using bulky equipment. These areas should be spacious enough to allow various layouts for a range of activities, toys and play equipment. ELC setting play spaces should be flexible and provide good visual and physical connections to the outdoors. To achieve inclusive spaces the DCSF recommends:

- Careful design for health and hygiene which is particularly important for very young children with SEN and disabilities (for example hygienic sand and water play facilities).
- Ground floor accommodation allows safe, level, easy access to the outdoors, preferably reached directly from indoor play areas.
- While children in ELC settings often eat their meals in the main play area, some children need a more sheltered place and support.
- Signage, vision panels and door handles (where appropriate) need to be low enough for young children to reach.
- Ramps should have very shallow gradients to suit very young children using wheelchairs or mobility aids.
- Changes of level may pose risks for some children, so suitable safeguards such as gates, lower level handrails and guardings should be provided.

In terms of support spaces the DCSF (2008) suggest that the following may be required:

- Sensory space.
- Soft play space.
- An additional quiet room or semi-enclosed space for support or therapy.
- Storage for mobility equipment.
- Battery charging for wheelchairs.
- A medical room.

4.7.4j Minimum space requirements

The Child Care Act 1991 (Early Years Services) Regulations 2016 states that “a registered provider shall ensure that adequate clear floor space is available in the premises for the work, play and movement of children attending the pre-school service.” (Government of Ireland, 2016). These regulations set out minimum space requirements as contained in **Table 7** below.

Table 7. Minimum Space Requirements for Full Day Care Service or Part-time Care Service

Age Range	Clear Floor Spaces
0-1 year	3.5 square metres
1-2 years	2.8 square metres
2-3 years	2.35 square metres
3-6 years	2.3 square metres

It should be pointed out that these are minimum standards, not optimum standards and in many cases a larger space will be to the benefit of the child in terms of play and movement.

4.7.5 Children’s Toilets and Nappy Changing Areas

4.7.5a Toilets

Toilet facilities should be provided for each unit or age-group and these should be easily accessed from the main activity or play space. According to the NCNA (2002) the following issues are important:

- Toilets should be located along an exterior wall for ventilation (will also facilitate natural light).
- Cubicles are sufficiently large to accommodate a staff member assisting a child, while the height of partitions and doors should provide both privacy for the child and facilitate supervision.
- Vision panels in partition walls to allow supervision for staff from main activity space.
- The height of wash hand basins should be at child level while taps should be easily operated (i.e. push down or lever arm).
- Child size toilets and potty areas should be provided for children who are going through their toilet training stage. A sluice sink and appropriate flooring will help with spillages.



Figure 35. Children's toilet with low level washbasins. Ballinderreen Community Childcare and Education, Ballinderreen, County Galway.

Improving the Accessibility of School Buildings (NDA, 2012) outlines a range of issues relating to accessible toilets highlighting that accessible toilets should be co-located with other toilets (often within the classroom). It points out that children with disabilities may need the toilet immediately on arrival and that this needs to be taken into account in the design and layout of toilet facilities.

The NDA document also reproduces a useful guide from the US Access Board providing advisory guidance on the height for children's toilets in healthcare settings (see Table 8).

Table 8. Advisory Guidance on the height for children's toilets in healthcare settings

Ages	3-4 years	5-8 years	9-12 years
WC Centrelines	12in (305mm)	12-15in (305-381mm)	15-18in (381-457mm)
Toilet seat height	11-12in (280-305mm)	12-15in (305-381mm)	15-17in (381-431mm)
Grab bar height	18-20in (457-508mm)	20-25in (508-635mm)	25-27in (635-686mm)
Dispenser heights	14in (356mm)	14-17in (356-432mm)	17-19in (431-483mm)

4.7.5b Nappy changing areas

Spaces for infants and young toddlers will need direct access to nappy changing areas that are separate from the main space but still provide visibility for the staff and children. The NCNA (2002) recommends the following:

- Handwashing facilities located next to changing area.
- Receive a minimum of 6 to 8 air changes per hour but higher levels of ventilation are desirable. Natural ventilation through windows is preferable (this will also allow natural light).



Figure 36. Nappy changing area. Tigers Childcare, Blanchardstown, Dublin 15.

4.7.6 External Children's Spaces and the Connection to Outside

External spaces will be discussed in Section 5.5.6, therefore this section concentrates primarily on external spaces that are directly adjacent or associated with the children's rooms.

4.7.6a Creating a relationship between indoor and outdoor spaces

The relationship between inside and outside as promoted in the Reggio Emilia approach and other guidelines are broached in Section 5.7.3. Furthermore, direct physical access and views to the outside are discussed as key issues in all children's rooms, regardless of age-group. This interconnectedness and relationship between internal and external space is facilitated by easily operated

doors and windows, adequate door opening widths (and ideally double doors or large sliding doors), and level access thresholds.

Malaguzzi et al (1998) argues that a building should express what is happening outside, and that the relationship between inside and outside is critical in early years. This can be achieved through what they call 'filter spaces' (verandas, canopies), conservatories, interior courtyards, outdoor spaces, and installations that highlight the natural elements such as wind or rain.

4.7.6b Covered Outdoor Spaces

The use of verandas and other covered outdoor space attached directly to a building can provide a useful transition space between inside and outside. Referred to as 'edge spaces' by Alexander (1977) he argued that an edge space:

"... increases the connection between inside and outside, encourages the formation of groups which cross the boundary, encourages movement which starts on one side and ends on the other, and allows activity to be either on, or in the boundary itself."



Figure 37. Covered exterior area to the rear of an ELC setting. Cheeky Cherubs, Ballincollig, County Cork.

In the ELC setting these covered areas provide intermediary space and sense of enclosure where a child who might be anxious about going outside can preview the outdoors or an outdoor activity as a step towards going fully outside (DCSF, 2008). It provides shelter and shade during inclement or hot weather. It also provides a changing, drying, and storage area for rain gear, wellingtons, and other outdoor apparel.

Covered outdoor areas can also take the form of freestanding structures such as sheds or garages and these can provide space for play, social activities, or outdoor learning. They may also have a more functional role as drying or storage space.

4.7.6c **Infant and toddler outdoor spaces**

Section 5.7.3 D will outline the benefit of a small covered outdoor space for infants to get fresh air and a change of scene. This area should be in a safe and sheltered location that is physically separated from the main play area, but still provides contact and visual access to the older children at play. These spaces should contain planting and other multisensory stimulation, along with soft level surfaces, but must be carefully maintained to ensure they are free from potentially dangerous items or debris. Physical separation in the form of low fences or railings will be required between infant, toddler, and older children's play areas to avoid accidents.

4.7.6d **Roof terraces and balconies**

Roof terraces and balconies can provide outdoor spaces and play areas. These areas will require appropriate guarding and an external fire escape stairs may be required depending on the circumstances.



Figure 38. Roof terrace used as play area. Fuji Kindergarten, Tokyo, Japan.

4.7.6E **Outdoor toilets or direct access to toilets**

The provision of external toilets or direct access to toilets from external play areas will benefit children and staff, and promote children's independence due to easier toilet access (Ceppi and Zini, 1998, NCNA, 2002, Scottish Government, 2017).

4.7.7 Family and Meeting Rooms

Much childcare design guidance (NCNA, 2002, CABE and DCSF, 2008, Scottish Government, 2017) calls for the provision of family rooms in larger settings to provide space for parents to interact with each other, or the staff. It can provide a place for meetings or for breastfeeding.



Figure 39. Central meeting area in an ELC in San Miniato, Italy.

4.7.8 Staff Areas

In larger settings, a comfortable, relaxing staff room in a location that provides good acoustic and visual separation from children's activities is an important part of staff welfare (NCNA 2002). The staff room should be provided with a kitchenette, dining table and chairs, easy chairs, and lockers (a TV and/or radio may also be beneficial). This space can also be used for staff training.

4.7.9 Kitchens

The size of the kitchen will be determined by the number of children to be catered for but the NCNA (2002) provide the following guidelines.

Table 9 A general floor area guide for food areas (kitchen and storage)

Number of Children	Floor Space
Less than 10	9.5m ² (minimum)
11 to 20	9.5 to 14m ²
21 to 30	14 to 18m ²
31 to 40	18 to 21.5m ²

Among other requirements, the kitchen should include the following:

- The working kitchen should be inaccessible to children.
- A food preparation zone with associated sink.
- A dedicated washing-up sink (double-bowled, or single bowled with dishwasher).
- A bottle and baby food preparation zone with sterilising facilities.
- Laundry washing machines should not be located in the kitchen.
- All kitchens should be separated from sanitary areas with a ventilated lobby.

4.7.10 Laundry and Utility

Laundry and utility areas are an essential part of childcare settings and will typically contain a washing machine, dryer, or airing cupboard. An area for cleaning equipment and products may be included in this room or form a separate room. The cleaning area should contain a large sink and draining board, a lockable storage area, and a low-level sluicing sink.

The laundry and utility should not be accessible to children and it should be separate to the kitchen or food preparation area.

4.7.11 Storage

In addition to storage located directly within children's rooms, provide a general storage area accessed by a corridor or common space such as the entrance or reception. Buggy storage is critical, although as discussed in Section 5.5.7, this can be provided externally. Storage of bulky items such as wheelchairs or hoists will also need to be considered.

A well organised storage area (internal or external) will allow the rotation of toys and play equipment as required. Storage must also be provided for natural materials and 'loose parts' as discussed in Section 3.3.4 D.

4.7.12 External Storage Areas

In addition to the storage of children's clothing or footwear, outdoor storage may be required for outdoor toys or resources, as well as maintenance equipment and tools. NCNA (2002) recommends the dispersal of storage areas throughout the external space, close to the area where the respective objects are being used. This storage should be designed for adult access but should be usable by children when supervised. Separate storage will be required for gardening equipment, tools and similar materials.

4.8 Elements and Systems

4.8.1 Building Construction, Materials and Finishes

4.8.1a Adaptability and flexibility

A key concern for Universal Design is that buildings should be flexible and adaptable to meet user needs over time (CEUD, 2015). An example of this is the tanking of all walls in a bathroom to allow flexibility in terms of shower location, or the provision of load bearing structures in strategic locations to allow fixing of handrails, grabrails, or hoists wherever they are required.

In broader terms, many ELC settings are designed to allow flexible layouts. This is promoted by CAGE and DCSF (2008) who argue that buildings evolve over time and the site and building position should facilitate growth and change. They point to the everyday flexibility that is required to create spaces for different age-groups, and varying atmospheres as required. Large open spaces with moveable elements, or folding partitions can be useful to create adaptable space. This adaptability and flexibility is central to the Reggio Emilia philosophy where the concept of 'epigenesis' is used to describe an approach that "is responsive and transformable, that enables different ways of inhabitation and use during the course of the day and with the passing of time. The space should also be personalisable, soft and open to imprints" (Ceppi and Zini, 1998).

4.8.1b Material and finishes

Children explore and interpret their world in a multisensory manner. Considering the materials and finishes used in any space greatly influence our sensory experience, it is critical that the materials and finishes in an ELC setting are carefully chosen in terms of light reflection, acoustic properties, microclimatic conditions, and tactile effects (Ceppi and Zini, 1998, Scottish Government, 2017).

Balancing visual stimulation

The materials and finishes within a setting influence the visual environment for all users and in turn impact sensory stimulation, attention and distraction. This is particularly important for young children who naturally experience high levels of distraction (Ruff and Capozzoli, 2003) and those who are acutely sensitive to their environment (Parsons et al., 2011).

While many typical ELC settings are quite colourful and visually busy, a different approach is promoted by Montessori and Reggio Emilia. A more controlled and carefully curated visual environment is a key part of these philosophies (Kuh, 2014). This is supported by research involving kindergarten children in the US that shows how multiple displays and materials within the classroom can distract children while a more controlled environment may support better learning gains (Fisher et al., 2014). In this regard, Barrett et al (2015) argue for an 'appropriate

level of stimulation', warning against excessive use of bright colours and visual complexity that may over stimulate children.



Figure 40. High Care Childcare, Ballincollig, County Cork. – Before: room prior to redecoration and fitting of new floors.

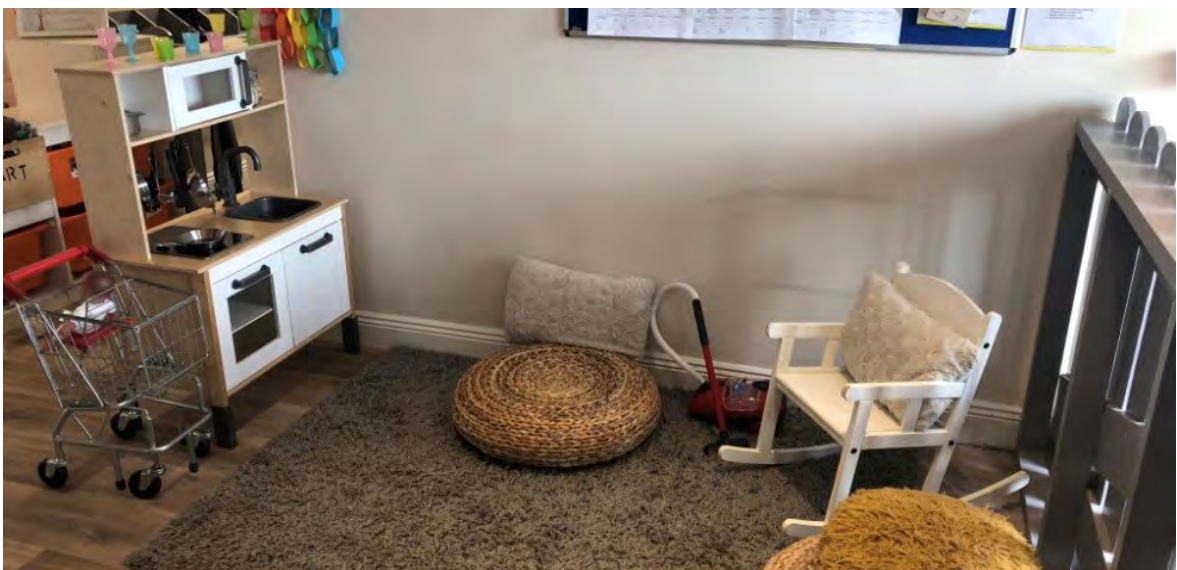


Figure 41. High Care Childcare, Ballincollig, County Cork. – After: room with natural colour floor and neutral colour walls and furniture.

This appropriate level of stimulation is also an important factor when designing for environments supportive of children with autism. The widely held consensus is that a calm, uncluttered and carefully structured environment will provide the sensory-attuned setting a child with autism requires (Gaines et al., 2016, Mostafa, 2014, Khare and Mullick, 2009, Scott, 2009a, Dept. of Education and Science Ireland, 2006). Notwithstanding this, Gaines (2014) warns against classroom under stimulation, which her research shows can be as negative as over stimulation.

“...balance is needed in all visual elements of design for classrooms. An under stimulating use of visual stimuli may be as detrimental to students as an overstimulating one. The classroom environment should be visually rich in order to stimulate learning for and improve the behaviour of students with ASD.” (p293)

To achieve a balanced approach to visual stimulation, careful attention should be paid to the selection of colours, bright or complex finishes and display materials. This applies to furniture, toys, and indoor and outdoor play equipment. It can be argued that this balanced approach to sensory stimulation reinforces the commonalities rather than the differences between the needs of all children (Gaines et al., 2016).

Surface reflectance and patterns: Surface reflectance and the use of patterns or surface designs attributed to materials and finishes have an impact on the visual environment. This relates to balanced visual stimulation as outlined above, but also has implications for people with visual and cognitive impairments. Excessive light reflection from surfaces can cause glare and result in visual discomfort and disorientation for these users. Strong floor patterns or floor finishes with complex designs can also cause disorientation and spatial confusion for many people (Bright et al., 1999, NIBS, 2015, Possin, 2010).

Careful control of surface reflectance and strong patterns can avoid issues for people with autism. Glare from surfaces due to sunlight or artificial light can be problematic for people who are hyper-sensitive to light (Coulter, 2009), strong patterns cause difficulties through distraction or over-stimulation (Mostafa, 2014) fixation on patterns (Paron-Wildes, 2013) (Coulter, 2009), an obsession with geometric pattern and the relationship to the location of objects within a space (National Autistic Society).

Colour: The impact and perception of colour depends on culture, context, gender and various other factors (Fehrman and Fehrman, 2000, Chebat and Morrin, 2007). Personal colour preference and preferred levels of illuminance have been found to influence user perceptions of colour (Jin et al., 2005). The moderating influence of illuminance levels appears frequently in research in terms of colour and visual perception (Manav, 2007, von Castell et al., 2018). Conditions such as Attention-deficit/hyperactivity disorder (ADHD) have shown to affect visual functions and colour perception (Banaschewski et al., 2006). More recent research by Kim et al, (2014, 2015) show a correlation between ADHD and difficulties with everyday visual functions such as depth perception, peripheral vision, visual search and visual processing speed. Their research also shows that people with ADHD may also experience colour perception difficulties with blue-yellow colours, with deficiencies in the central nervous system associated with ADHD as a possible cause.

Research regarding the impact of colour on children with autism varies greatly and has been shown to depend on the child's preferences (Gaines et al., 2014).

Colour is therefore a very complex, subjective and contextual experience and it is very difficult to propose specific colours that will be effective for a range of building occupants and locations. With this caveat in mind, there are some broad recommendations that should be considered as part of UD approach to ELC settings. This involves the creation of a calm, balanced environment, wayfinding, the influence of colour on spatial perception, and some broad theories around the emotional or psychological impact of colour.

Firstly, it must be reiterated that the impact of colour in the early years environment is contingent upon the diverse sensory, cognitive and developmental abilities of all children and all users in the setting. A balanced, calm, yet gently stimulating approach is vital. Colour should be used sparingly to create a harmonious environment, while stronger accent colours can be used to define certain areas or thresholds or provide visual cues and landmarks. Striking the balance between under stimulation and over stimulation is a challenge, but as discussed earlier, it is critical to a supportive environment for children - colour is central to this balance.



Figure 42. Neutral colours creating a calm environment in an ELC setting in San Miniato, Italy.

Secondly, colour can play an important role in wayfinding and orientation for young children in a setting. The use of distinct colours to create visual landmarks has been shown as an effective wayfinding strategy. It should be noted that while the use of different and distinct colours reinforces memorability of locations and landmarks, there is little proven association between memorability and any particular colours (Helvacioğlu and Olguntürk, 2011). The use of colour

to create landmarks and visual orientation nodes is also effective for children with autism in educational settings (Gaines et al., 2016, Mostafa, 2014) where hypersensitivity, poor proprioception (i.e. the ability to know where your body is in space), or an inability to understand typical wayfinding symbols (Paron-Wildes, 2013) may cause disorientation or anxiety. This is particularly relevant in larger settings or one where children have the freedom to move about independently.

Thirdly, common design practice suggests that lighter colours increase a sense of spaciousness within a room. There is some research to support this (Oberfeld et al., 2010), showing how lighter colour ceilings and wall generally contribute to a perception of spaciousness. More recent studies also confirm this (von Castell et al., 2018), finding viewers estimate rooms to be larger than they are when painted in bright colours, while underestimated spatial dimensions for rooms painted in darker colours. In addition, this research shows light coloured surfaces (e.g. a rear wall) will make this surface visually recede (e.g. appear further away), while darker coloured surfaces will make that surface visually advance towards the viewer (i.e. appear closer than it is).

Finally, while there is a lack of research regarding the emotional or physiological impact of colour, and where it does exist there is often conflicting findings (Gaines et al., 2014), experts cautiously suggest some colour implications for people across the age spectrum (Calkins, 2002, Gaines et al., 2016, NCNA, 2002, Schauss, 1985):

- Red is a warm colour that is believed to be stimulating and increases perceived room temperatures and decreases the perceived size of a room. It is linked with higher blood pressure and an increased sense of smell.
- Orange is a warm colour, strongly associated with nature and earthiness. It is also associated with cheerfulness and the sun.
- Pink has been shown in certain cases to decrease aggression and is perceived as a relaxing and calming colour.
- Yellow is a highly visible colour and has strong communication qualities. It is believed to be a restful colour that increases perceived room size. It is typically associated with clarity, optimism and the sun.
- Blue is a cool colour, believed to be restful and calming, and that decreases perceived room temperatures and increases the perceived size of a room. In some cultures, it represents tranquillity, wisdom, an awakening or transition to another world or state of mind.
- Green is a cool colour, believed to be very restful, and increases the perceived size of a room. It is strongly associated with nature, and represents freshness, growth, harmony and balance.

As discussed at the start of this section colour is very subjective, and will be perceived differently depending on age, gender, or culture, not to mention contextual influences such as location, lighting conditions, time of day, season, or indeed fashion.

Internal floors: Small children spend most of their time on the floor and therefore the suitable floor finish is crucial. Certain areas will require waterproof and anti-slip finishes, while rest areas will require softer, more comforting materials (NCNA, 2002). Balancing interesting and natural floor finishes with safety, maintenance and being easy-to-clean is a challenge and must be carefully considered to ensure materials provide the multisensory qualities critical to the ELC setting (Ceppi and Zini, 1998, Scottish Government, 2017).



Figure 43. Mixture of hard wearing floor covering and soft mats. Lux Children's Club, Moate, County Westmeath.

Internal walls: In a similar way to floors, the lower sections of walls are an important part of a child's environment and must strike a balance between sensory stimulation, safety and maintenance. Walls provide the main display areas in the ELC setting and should be constructed and finished with robust materials to handle a high level of wear and tear. While display boards will provide dedicated areas for mounting various artwork, photographs etc, all walls should be capable of taking materials of some sort.



Figure 44. Walls used to support shelf units and hang art material. Lotamore Family Centre, Cork.

Internal ceilings: According to the NCNA (2002) the ceiling within the ELC setting should be of a colour that creates a sense of space, easily maintained, and constructed using materials that will support hanging mobiles and other objects.

External materials: Many of the issues discussed in relation to internal elements are also applicable to external areas. However, outside spaces will provide opportunities for a greater variety of natural materials and sensory experiences. According to the Scottish Government (2017) outdoor space should allow children to “experience nature, to feel the grass under their feet, to plant, to dig for worms, experiment with mud, stones, to climb trees and to enjoy getting dirty.” This guidance gives a good sense of the multiplicity of spaces, surfaces and materials required for a good ELC setting outdoor area.

Notwithstanding the multiple materials and finishes that might be present in an outdoor space, the NCNA (2001) provides the following guidance:

- Surfacing should not have any sharp protrusions or edges.
- It should have no entrapments (spaces in which fingers or feet could get caught).
- Impact absorbing surfaces should be used where falls over 60cm are possible.
- The minimum thickness of impact absorbing tiles is 2.5cm. The edging and joints between the tiles should not form a trip hazard and ideally should be at the same level as the surrounding hard surfacing.
- Hard surfaces should only be used outside the impact area.

- Topsoil or turf may be used up to a critical fall height of 1m.
- Materials should be laid to prevent pools of water from gathering. Small grated drains may need to be fitted.
- Hard surfaces should be used where there is constant play and paths, but never where climbing takes place.
- Loose fill impact absorbing surfacing includes sand and bark chips which should be installed to a minimum depth of 30cm.



Figure 45. Combination of accessible path and grass play areas. Aghada, Community Playgroup, Aghada, County Cork.

Different age groups and children, staff or visitors of various physical, sensory or cognitive abilities will have different needs within the outdoor space and therefore UD surfaces and finishes will have to be considered. Many outdoor play areas provide barriers for children with disabilities (Burke, 2013), for instance where sand causes difficulties for children in wheelchairs, or the use of grey coloured play equipment that is hard for children with visual impairments to see (Prellwitz and Skar, 2007). Prellwitz and Skar also found that even when children with disabilities could use the play area, they did not interact with their peers to the same extent as children without a disability, because they were typically unable to use the space independently and were often assisted by an adult.

Ground surfaces in outdoor areas are a key part of their design, and should provide a wide variety of experiences. Impact absorbing surfacing (IAS) may be appropriate in certain circumstances. However, as advised by (Casey and Harbottle, 2018), grass is suitable, for instance, where falls may occur from heights less than 1m and where heavy wear or drainage is not an issue. These authors promote the use of natural materials and argue for the balanced use of loose fill natural materials (e.g. bark or sand), and synthetic material such as wet-pour, which will facilitate wheeled play. It should also be noted that smooth, level

materials such as wet-pour will also support staff and visitors of various ages, abilities and disabilities.

For all elements within the ELC setting, non-toxic and non-allergic materials are not only an important aspect of healthy child-centred design (Zhang et al., 2006), but are also an aspect of accessibility. The CEN-CENELEC Guide 6 - guide for addressing accessibility in standards - includes immunological system functions as a key human characteristic to be considered in relation to accessibility. Allergies and hyper sensitivities to substances in the physical environment impair human performance and undermine a person's ability to use a space or system. The following is advised:

- Avoidance of allergens or substances known to cause hypersensitivity,
- Ventilation systems that filter out allergens,
- Prevention of mould growth through appropriate levels of humidity,
- Avoidance of dust collecting elements,
- The creation of allergy-free areas.

4.8.2 Fit-Out Elements

The fit-out elements of an ELC setting are an important aspect of a child's multisensory environment and should be carefully considered as part of their sensory development and education (Ceppi and Zini, 1998, Scottish Government, 2017). Windows and doors admit light and provide views and access to the outside world (NCNA, 2001), and the various fittings such as taps or cupboard handles are interacted with great intensity by inquisitive children.

Doors: Doors and door handles are some of the elements that all users will interact with on daily basis. From using the main entrance door, to entering a children's room or a toilet, the accessibility, usability and understanding of these elements is critical (CEUD, 2014b). Wide door openings, or double doors at the entrance and key circulation areas will facilitate buggies and wheelchairs, and will help parents and guardians with more than one child, or when carrying child-related equipment (NCNA, 2001). This will particularly help at peak times. In some internal locations the installation of double doors or 'Cat and Kitten' type doors will help with movement inside the ELC setting.

Doors providing access to communal areas within the building, and access to outdoor space are particularly important and should support the inside-outside relationship promoted in various guidelines (Ceppi and Zini, 1998, Scottish Government, 2017).



Figure 46. Large sliding door providing the flexibility to open up or close off spaces. Tigers Childcare, Blanchardstown, Dublin 15.

All ironmongery and access controls should be accessible, easily used, and understood for all ELC setting users. Certain door handles and controls need to be out of reach for small children, therefore, the location and operation of these must be carefully considered in terms of Universal Design.

Windows: The windows to the ELC setting control much of the interaction between inside and outside, not only in terms of views and daylight, but also in terms of sound, ventilation and thermal insulation. Windows should provide maximum views to the outside, allow children and adults to experience positive stimuli such as bird song, external activities, or the elements of wind and rain. Windows can support the relationship with the outside, which is central to the Reggio Emilia approach (Ceppi and Zini, 1998). Window sills and transoms should not obscure the view to outside, remembering children who may be crawling on the floor, or the eye-line of young toddlers. Windows should be easily operated by staff, with appropriate restrictors ensuring the safety of children.

Windows also protect building occupants from disruptive external noise, solar glare or excessive solar heat gains, or conversely, heat loss.

Sanitary fittings and associated nappy changing facilities and equipment:

Guidance regarding Universally Designed sanitary facilities is provided in Booklet 5 of 'Building for Everyone: a Universal Design Approach' (CEUD, 2014d) including guidance regarding nappy-changing facilities. This guidance sets out the need for changing benches or tables at both 800mm and 1200mm to facilitate people of different heights or use when seated.

Some additional considerations have been outlined in Section 4.7 of this report, including the need for child size toilets (280-305mm above floor level) and age-appropriate sinks.

Electrical fittings and controls: While electrical fittings and controls will typically be placed out of reach for small children, they must still comply with the Technical Guidance Document M of the Building Regulations 2010 (DECLG, 2010) and the guidelines set out in Booklet 5 of 'Building for Everyone: a Universal Design Approach' (CEUD, 2014c).

Signage and Graphics: All fit-out elements within the ELC setting play a critical part in a child's development, including signage and graphics. The walls and ceilings become an important part of the setting and are used to mount artwork, photos, educational information and much more. However, in terms of signage and graphics, and in the context of Universal Design, this research concentrates largely on the wayfinding and orientation within the setting. Wayfinding, can be defined as "a collective term describing features in a building or environment that facilitate orientation and navigation" (CEUD, 2014c) and depends on many factors (Huelat, 2007). However, signage and graphics play a big part in helping a person to navigate around any building.

Due to the small size of many ELC settings there is a level of familiarity that many users will have with the environment. However, there are users such as people who might visit infrequently, or those with a visual, cognitive or intellectual impairment that will benefit from well placed, legible and easily understood wayfinding signage within the setting.



Figure 47. Wayfinding signage providing directions upon entering the site. Tigers Childcare, Blanchardstown, Dublin 15.

Building for Everyone, Booklet 4 (CEUD, 2014c), outlines four types of signage typically required in buildings:

- **Information signs.**
- **Directional signs.**
- **Identification signs.**
- **Mandatory signs.**

It is helpful to take a consistent approach across these categories so that each type of sign has the same appearance. This will help a person identify signs and understand that one set of signs is for getting you there (i.e. directional signs) while another set of signs tells you that you have arrived at your destination (i.e. identification signs).

In this regard, the Building for Everyone (BfE), Booklet 4 provides the following guidance regarding the location and positioning of signs (CEUD, 2014c). For signage requiring close-range viewing, the following is recommended:

- **Directory signs and room identification signs: Height 1400-1700mm above floor level.**

Wall-mounted signs should not project more than 100mm from the wall surface. Signs to be mounted on the wall adjacent to the leading edge of room doors rather than on the door face so that they are visible at all times and to ensure that the door is not opened while someone is reading the sign /braille. Embossed signs to be positioned where a person can approach and touch the sign without being obstructed or causing an obstruction to other people.

- **Detailed maps, diagrams, and timetables: Centred 1400mm above floor level, with the lower edge no lower than 900mm and the upper edge no higher than 1800mm above floor level.**

For directional or identification signage requiring medium-range viewing, the BfE recommends:

- **Suspended signs: 2300mm clear headroom to the underside of the sign.**
- **Wall-mounted projecting signs: not projecting more than 100 mm from the wall.**
- **Post-mounted signs: located at least 2000mm above floor level.**

For directional or identification signage requiring long-range viewing, the BfE recommends:

- **In large spaces, and where visibility of signs may be obscured by crowds, the height should be greater than 2300mm.**

With regard to signage colour, consistent visuals for each and all categories of signage will help ELC setting users identify the kind of signage they are looking at.

For signage legibility the contrast between the signboard and the colour of the text is important. Contrast is determined by the Light Reflectance Value (LRV) of each colour, and is measured between 0 and 100, where a high LRV results in a bright colour, while a low LRV results in a darker colour. For good colour contrast there must be an LRV contrast of at least 70% between the text and the background colour (e.g. there is an 88% LRV differential between a white background and royal blue text) (CEUD, 2014c).

The surface finish of the signage should be non-glossy or non-reflective so as not to cause difficulties for those with visual or cognitive impairments.

For signage font-typeface and size, Sans serif display typefaces such as Arial or Futura are considered highly legible. Letter size on signage is determined by the appropriate viewing distance and the BfE (CEUD, 2014c) provides the following viewing distance and font height guidance:

Table 10:

Viewing distance	Font height
6000mm	200mm
4600mm	150mm
2500mm	100mm
1500mm	50mm
750mm	25mm

The BfE (CEUD, 2014c) recommends capitalising the first letter of names and locations, with all other letters lower-case.

Finally, the use of simple easily understood language and terminology will help with wayfinding and this will be reinforced by clearly associated symbols or icons.

4.8.3 Internal Environment

In terms of the indoor environment, Bluysen (2009) outlines four key environmental factors that affect how humans perceive their environment, and in turn how this environment impacts on their health and well-being. These include:

- Visual or lighting quality (view, illuminance, reflection).
- Thermal comfort or indoor climate (temperature, moisture, air velocity).
- Indoor air quality (odour, fresh air, air pollution).
- Acoustical quality (indoor and outdoor noise, vibrations).

While other human senses such as kinaesthetic sense (Bluysen, 2009), or the haptic or taste-smell sensory systems as proposed by Gibson (1968) are important, even the four key environmental factors outlined by Bluysen illustrate the complex nature of the person-environment sensory relationship.

With this relationship in mind, Hawkes (2008) laments the constrained environmental conditions that exist in many modern buildings and argues: “[t]he complex sensory experience that we enjoy in buildings implies a wholly different dimension to the idea of the architectural environment from the pragmatic and mechanical processes of climate modification and comfort engineering.” Similarly, Pallasmaa speaks about the “Architecture of the Senses” (2005:48) and points out how the architectural setting acts upon human senses. He argues that we confront the world through all these senses, and that architecture plays an important mediating role between humans and the world through these embodied experiences.

The Reggio Emilia approach also advocates this multi-sensory engagement with the world through the natural environment, light, colour, temperature variation, tactile materials, smells, sound and more (Gandini, 1998).

4.8.3a Natural and artificial light

Creating ‘lightscares’ is an important part of the Reggio Emilia approach where it is primarily used for “visibility, the aesthetic image, and the sensation of the passage of time” (Ceppi and Zini, 1998). To this end, both natural and artificial light are used to emphasise or play with spatial geometry, texture, colour, shadows, and light modelling as way to create a multisensory environment for children.



Figure 48. Desk light used to draw attention to box of interesting objects. Carraig Briste, Enniscorthy, County Wexford.

Natural and artificial light is vital for ‘placemaking’, an important child development and educational characteristic discussed in section 4.4 of this report (Ellis, 2005, Strong-Wilson and Ellis, 2007). In this regard, and speaking about ELC settings, Olds argues that “the spirit of place depends more on the presence of natural light than perhaps any other factor” (Olds, 2000).

According to the NCNA (2002) lighting plays an important role in the creation of ambiance and atmosphere, where bright light is used for activity and stimulation, while softer light helps with rest and relaxation. Sleeping areas should have the facility to dim lights or block out daylight.

While taking on board the importance of light in terms of sensory experience, placemaking, and ambiance, there are a number of UD issues to be considered in terms of lighting. These include the following:

- Good levels of natural light throughout the building will reduce the need for artificial lighting and therefore benefit people with autism who may be sensitive to some forms of artificial light (Coulter, 2009).
- Good levels of natural light will benefit many people with visual impairments and older people by providing higher levels of illumination (NIBS, 2015, CEUD, 2014c).
- Control glare from direct or indirect sunlight as this can cause visual discomfort or difficulties for certain people (DCSF, 2008).
- Provide evenly distributed, consistent illumination and avoid harsh contrasts or excessive shadows which can cause visual difficulties for building occupants (DCSF, 2007).
- Provide task lighting to enhance task visibility or provide higher levels of illumination to specific areas such as steps or ramps (CEUD, 2014c).
- Careful colour rendering and tonal contrast to ensure spaces and objects are visible for occupants with visual impairments or who are colour blind (DCSF, 2007).
- Ensure good levels of natural and artificial light for people who need to lip read (DCSF, 2007).
- Avoid glare, flicker and unwanted noise from light fittings (DCSF, 2008).

4.8.3b **Thermal comfort and indoor air quality**

The Quality and Regulatory Framework (Tusla, 2018) recommend a temperature range of 16-20 °C for children’s sleeping areas and these spaces should receive 3 air changes per hour. For other internal areas they recommend 18-22 °C.

Excessive heat or cold can be a distraction from learning causing difficulties for children depending on their needs. In this regard the DCSF (2008) recommend temperatures of 18–21°C for mainstream conditions. However, for special schools and resourced provision an upper limit of 23°C is suggested, while children with more profound needs who may be wet or partially clothed for a

period of time may need temperatures between 25-30°C. In mainstream schools overheating occurs when 28°C is reached, but this may occur much sooner for certain children depending on their needs. This guidance shows the complexity of achieving comfortable and healthy thermal comfort for all users in settings that cater to a range of abilities and disabilities.

Where radiators are used, care should be taken to eliminate any risk of burn injuries through contact with radiator surfaces, particularly for younger students, students with intellectual disabilities or people with reduced sensation. This can be achieved through the use of thermostats and/or appropriate radiator covers.

In terms of ventilation, most guidance for ELC settings expresses a preference for natural ventilation and openable windows are proposed as an ideal form of ventilation (Gandini, 1998, Ceppi and Zini, 1998, DCSF, 2008, NCNA, 2002, Scottish Government, 2017).

The 2012 NDA guidance provides information regarding ventilation for school buildings that will help to inform the ELC setting guidance. The key points include:

- **Effective ventilation is important for all students. A lack of fresh air can cause concentration and drowsiness issues.**
- **Where mechanical ventilation systems are used, it is important that their operation is virtually silent: background noise can seriously affect the acoustic performance of a classroom.**

For certain areas within the setting mechanical ventilation may be required to achieve the air changes necessary to maintain healthy indoor air quality. The Health Services Executive recommend the following (Management of Infectious Diseases in Childcare Facilities and Other Childcare Settings):

Air changes per hour	Area
10-15 air changes per hour	Laundry areas
3 air changes per hour	Toilet compartments and sluice rooms
2 air changes per hour	Lobbies, stairwells and other access areas
3 air changes per hour	Play and rest areas

* All sanitary accommodation and nappy changing areas must be ventilated directly to the external air.

4.8.3c **Sound**

The 'multisensoriality' advanced in Reggio Emilia includes close attention to the 'soundscapes' and the role of sound as part of any relational design approach (Ceppi and Zini, 1998). They argue that sound helps to define and characterise places, and that they are an essential human stimuli that mediates between the person and their environment.

While the positive multisensory nature of sound must be remembered, it is important to note how sound might affect certain occupants, particularly infants or children with disabilities or special educational needs. Design guidance related to children with autism highlights the potential impact of sound (McNally et al., 2013) while DCSF (2008) notes how children with communication, learning, behavioural, communication and interaction difficulties, and other disabilities, rely on good room acoustics and sound insulation to support their learning, comfort, and social interaction.

Good acoustics are a key element when designing for children and adults with disabilities or special educational needs. The basic principle for creating good acoustic environments is to increase sound - help a person with a hearing impairment to hear important things; and at the same time reduce noise. It is not only about blocking things out, it is about ensuring that a person can hear pleasant and stimulating sounds, as promoted by the Reggio Emilia approach.

A suitable acoustic environment is important, rooms with long reverberation times and hard materials that reflect sound will be unsuitable for many children, including those wearing hearing aids (i.e. where the hearing aid amplifies noise) (DCSF, 2008). According to IOA (Institute of Acoustics) and ANC (2015) low frequency noise is a major issue as it can interfere with speech recognition by masking important speech sounds.

Careful consideration must be given to the location of key spaces to provide a calm environment and restful/relaxing spaces; planning and design must consider how best to handle noise generating activities, the silent running of equipment and appliances will be important; and, acoustic separation and insulation must be carefully designed (IOA and ANC, 2015, DCSF, 2008).

Fire detection and alarm systems are mandatory in ELC settings and as part of these an audible alarm is required to warn occupants about the detection of a fire. However, many alarms are designed with very loud sounders that produce a sound level in excess of 100 decibels (dB). This is known to disorientate many people and make communication difficult, not to mention the negative impact on small children and users who are hypersensitive to noise.



Figure 49. Excessive alarm sounds can cause disorientation and extreme anxiety.

The minimum sound level required for fire alarms, when measured within one metre of any wall or partition, is either 65 dB, or 5 dB above any other noise likely to persist within the space for a period longer than 30s (NSAI, 2013). It is preferable to use a larger number of quieter sounders as opposed to a small number of very loud sounders (ibid) This will reduce excessive noise levels emitted from the alarm sounder and create a calmer environment during an emergency evacuation or fire drill.

4.8.4 Technology

Assistive technology can be defined as “any item, piece of equipment or product system, whether acquired commercially or off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities” (Yell et al., 2006).

4.8.4a Internal technology

Regarding assistive technology in the educational setting, the 2012 NDA guidance identifies how children with disabilities may require a wide range of assistive technology, including magnifiers, screen reading technology, and portable writing and communication devices. To facilitate this, there should be a sufficient supply of electrical outlets in the ELC setting, while floor-mounted sockets can avoid the hazard of cables trailing across the floor.

Technology for mobility and physical impairments: Ceiling mounted hoists and adjustable changing tables may be required for children with limited mobility.



Figure 50. Power operated door providing easy access for person with buggy.

Technology for visual impairments: Most visual impairment support consists of Information Communication Technology (ICT) equipment, large format books, braille and other small scale items. In terms of the building the main considerations relate to storage space, adequate power supply and data cables/sockets.

Technology for hearing impairments: IOA and ANC (2015) guidance outlines a range of whole class technology that is of benefit to all occupants, not just children with hearing impairments. These include:

- Whole classroom soundfield systems that help distribute sound around the room through a microphone and amplifier. This is also known as sound reinforcement and will not be suitable for profound hearing loss.
- Induction loop systems that transmits directly to a person's hearing aid.

Physiotherapy, Occupational Therapy, and Speech and Language Therapy:

DCSF (2008) provides guidance around the space requirement and general layout for rooms to facilitate various forms of therapy. In terms of the building and technology, the main considerations involve storage space, adequate power supply and data cables/sockets. A physiotherapy space may require a hoist or height adjustable couch. An occupational therapy space will require adequate storage for rehabilitation equipment, while a speech and language therapist may require an induction loop or hearing aid facilities.

4.8.4b External technology

In terms of external activity and play spaces, Rudd (2008) examines ways in which technology can enhance these spaces as multi-sensory, interactive learning environments for children. Technologies used in the external environment include coloured lighting which changes patterns or moods, lighting or digital projections, proximity, or accelerometer sensors which trigger an object to react to a child's behaviour, or acoustic devices which emanate sounds if they are touched.

Rudd presents some examples of this kind of technology such as Bishopswood Special School in South Oxfordshire in the UK, which has installed a dynamic sensory garden which uses seismic sensors set into coloured steps and which are activated by children's feet and emit various sounds. The John Hopkins Trust for special children in Gloucester in the UK also uses similar technology to create a 'Whispering wall' which projects natural sounds when triggered by children's activity (<http://www.rattraymosaics.co.uk/img/kitea.jpg>).

Given the potential diverse users of an ELC setting, especially parents, older relatives or staff who may have some form of sensory or cognitive disability, any ICT that helps an ELC setting user navigate to and around the setting is worth considering. Atkins (2010) suggests that Radio Frequency Identification (RFID) or Global Positioning Systems (GPS) technology could be used to imbed information in the built environment which could then be read by vulnerable pedestrians using a detection device such a smart phone.

Willis describes an RFID information grid to assist people with visual difficulties with navigation and wayfinding in an ELC setting (Willis and Helal, 2005:1). This involves the installation of RFID tags along external circulation routes and an RFID reader integrated into a shoe and a long cane. While this system was focused on navigation for people with visual difficulties, Willis, suggests other uses such as "aid in automated navigation for electronic wheelchair users, and supports service robotics that can use the RFID tags to determine exact location."

Mobile smart phone applications (apps) such as Navigon already exist in the market place and are popular with people with visual difficulties. This app transforms a smart phone into a mobile navigation device, providing text-to-speech voice guidance, pedestrian navigation, turn-by-turn route guidance and a take me home function (Leibs, 2012). Other smart phone apps such as NavPal are currently under development by researchers at Carnegie Mellon University combines GPS technology with audio and tactile cues to facilitate navigation (Pittsburg Post Gazette, 2012).

These technological advances will inevitably benefit many users with sensory, mobility or cognitive difficulties as they will enable users to navigate through their environment with greater ease, comfort and safety. Whether it is through RFID or GPS technology directly linked to embedded technology in the street surface, walls or objects, or other assistive devices, users will be able to detect

obstacles, dangers and safe routes in a far more reliable manner. These technological advances will inevitably benefit many users with sensory, mobility or cognitive difficulties as they will enable users to navigate through their environment with greater ease, comfort and safety. Whether it is through RFID or GPS technology directly linked to embedded technology in the street surface, walls or objects, or other assistive devices, users will be able to detect obstacles, dangers and safe routes in a far more reliable manner.

However, Atkins (2010) acknowledges that technology such as this could only be used to provide additional information rather than replacing traditional hard infrastructure wayfinding mechanisms. If technology were the primary wayfinding tool it would need to be unrealistically reliable or run the risk of leaving vulnerable pedestrians stranded in an unfamiliar and unsafe environment.

4.9 Conclusion

While the seven UD principles as outlined in the previous chapter provide a good framework for designing an ELC setting, it is also worth looking at the 'Universal Design Guidelines for Homes in Ireland' (2012). In this guidance the concept of neighbourhood integration and adaptability over time is introduced. The seven UD principles are condensed to produce the following four principles:

- 1 Integrated into the neighbourhood.
- 2 Easy to approach, enter and move about in.
- 3 Easy to understand, use and manage.
- 4 Flexible, cost-effective and adaptable over time.

Considering the issues discussed in this chapter in relation to the ELC setting, particularly the need for integration into the community, these four principles are very relevant. They draw together the many strands that have been investigated throughout this review. In overall terms they broadly address the spatial scales that influence UD. Unless an ELC operates successfully across these scales, it will fail many of its users through lack of accessibility or usability on one or many levels. These four principles also help with the creation of child and community friendly environments as discussed in this review.

Integrated into the neighbourhood, highlights the relationship with community. The ELC setting and the local community should have a symbiotic relationship and the setting should be viewed as a piece of community-based social infrastructure to be celebrated and supported.

Easy to approach, enter and move about in, ties together the many dimensions covered in Sections 4.5 where various issues around the local environs, boundary conditions, entering and exiting, and setting circulation are examined in detail. One of the key concerns arising from this section is the delicate balance required between safety and security, and the connection and integration with the community.

Easy to understand, use and manage, covers a wide spectrum of considerations across various scales; from the wider issues around circulation and wayfinding, to more specific issues such as signage and ICT. If an ELC setting is part of the wider community in a meaningful way, it will need to cater to a wide range of users including staff, students, and family members. To be inviting to the community and fully supportive of all users, the setting must not only be accessible in the physical sense, but also take cognisance of sensory, intellectual and cognitive abilities to ensure it provides a usable, safe and friendly environment for all.

This report has looked in detail at many issues which inform the design of an ELC setting, while investigating the role that UD can play in creating a setting that is: integrated into the neighbourhood; easy to approach, enter and move about in; easy to understand, use and manage; and, finally, is flexible, cost-effective and adaptable over time. While not exhaustive, the material presented gives a good overview of the key issues pertaining to an ELC setting and the adoption of a UD approach.

5 Overall Conclusion



Figure 51. Water-play, Lux Children's Club, Moate, County Westmeath.

5.1 Introduction

This literature review has examined evidence-based research regarding Best Practice in Early Learning and Care (ELC) provision and Universal Design (UD) (including best practice in Inclusive Design, Design for All and Accessible Design). The results have been synthesised as a set of findings and provide key recommendations to underpin the guidelines and self-audit tool.

ELC settings provide one of the most important environments that infants, toddlers and young children will experience in their early lives. These settings must provide inclusive environments that cater to a diversity of children with varying abilities and a range of learning and care needs. They must provide a supportive working environment for the staff working in these settings. Finally, they must support family members who use the buildings every day. Considering the important role played by all members of a child's family, the settings must take into the account the wide spectrum of ages, sizes, abilities or disabilities these families will represent.

To examine these issues and provide an evidence base for the guidelines and audit tool, this literature review has examined a wide range of empirical and expert based material in a national and international context. The findings that emerged from this review provide a synthesis of two key areas related to a UD approach for ELC settings, firstly the key pedagogical and care issues for settings that inform the overall UD approach, and secondly the key built environment issues that underpin a UD environment that is accessible,

understandable and easy to use by all children, staff and family members. The findings are grouped into eight categories and these are discussed below.

5.2 Key Findings

These themes below include the overall policy background, identify the diversity of users to be catered for, sketch out the UD approach and philosophy that frames the overall endeavour, and then highlight the key pedagogical and childcare issues. Only then can we start examining the main built environment implications and requirements for the proposed UD Early Learning and Care guidelines and Self-Audit tool.



Figure 52: Key Findings

Inclusive Pre-School Education: Recent Developments in Ireland

Underpinned by a government commitment and influenced by research on the efficacy of early childhood education and the core principles of human rights; social justice and equality of opportunity, early learning and care in Ireland has undergone a seismic transformation in recent years, culminating in the publication of First 5, Whole-of-Government Strategy for Babies, Young Children and their Families (2018). These developments form a natural policy background for UD and a more inclusive ELC sector.

Diversity of ELC users and the need for an inclusive approach

Inclusive education, as demonstrated by the policies above, takes a holistic view of the child and embraces human diversity. This aligns with the Universal Design

approach to the built environment where due consideration is given to all users including children, family members, staff and visitors. This is echoed by the Diversity, Equality and Inclusion Charter and Guidelines for Early Childhood Care, which acknowledge the diversity of a typical ELC setting, and argues that these settings must embrace the needs of all children and provide an inclusive and accessible environment to ensure equal participation and access to culturally and developmentally appropriate play-based indoor and outdoor activities.

Beyond children with disabilities, this research and findings highlight the Universal Design philosophy, which recognises that diversity is the norm, a position that is testified to by the wide range of people who attend, work in, or visit a typical ELC daily. This spectrum extends from an infant to an older person who might be a childminder or grandparent who drops-off and picks up the child every day. In between this is a range of ages, sizes, abilities and disabilities represented by the children, staff and family members who use the building.

Convergence between UD and Inclusive Early Learning and Care Policy

Universal Design as defined in the introduction to these key findings promotes inclusive built environments that are accessible, usable and easy to understand. Universal Design is much more than removing barriers, it is about providing an actively supportive environment. In this context, a UD approach can help provide the supportive, healthful, and child-centred environment required to fulfil the inclusive ELC policy discussed above.

Design and spatial requirements framed by key Síolta Standards

The Síolta principles of quality embody the vision, which informs and provides a context for quality practice in ELC in Ireland (CECDE, 2006). Síolta, in the first of its twelve principles affirming the value of early childhood, states that “Early childhood is a significant and distinct time in life that must be nurtured, respected, valued and supported in its own right” (CECDE 2006, 6). Other key principles include Children First; Parents; Relationships; Equality; Diversity; Environments; Child Welfare; the Role of the Adult; Teamwork; Pedagogy and Play. These principles of quality underpin the standards and components of quality, which further elaborate on, and define quality practice. The breadth of the sixteen Síolta standards is very wide, incorporating the Rights of the Child; Environments; Parents and Families; Consultation; Interactions; Play; Curriculum; Planning and Evaluation; Health and Welfare; Organisation; Professional Practice; Communication; Transitions; Identity and Belonging; Legislation and Regulation and Community Involvement (CECDE 2006).

Following extensive consultation with both the partners and Steering Committee, six of the sixteen standard were selected for the purposes of the development of the **Universal Design Guidelines for Early Learning and Care**

settings (See Figure 53 below). Given that the UD Guidelines relate completely to ELC environments, clearly Standard Two: Environments is inextricably linked also and underpins the investigation of the other six standards.

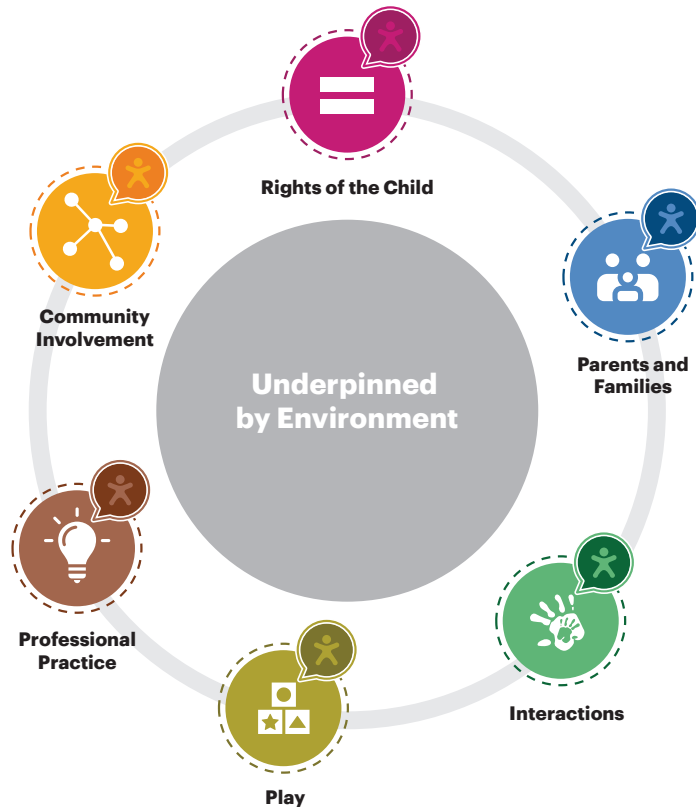


Figure 53. Síolta Standards Guiding the Literature Review

Using these six Síolta Standards, the preceding literature review was conducted to investigate these standards and to draw out the main implications for the ELC built environment. The following sections present each Standard and sketch out some of the main spatial and design considerations for each standard. These considerations are discussed in line with each selected standard, but it is acknowledged that there may be an overlap between many of these spaces.

Standard One: The Rights of the Child – Key built environment considerations include: large scale issues relating to how settings are well connected and integrated with the community: building layouts and design that allow children to freely circulate and associate with his/her peers; down to spaces and materials, which allow the child to freely express himself/herself through a range of media.

Standard Three: Parents and Families – Key considerations include: the provision of accessible and welcoming spaces for parents/carers to interact with each other and staff; environments that reflect the diversity of parents/families; and space to accommodate families including extended families for specific occasions.

Standard Five: Interactions – Among other issues, the setting should provide: a mixture of large and smaller indoor and outdoor spaces for children to explore and navigate; spaces, resources and provocations to maximise children’s engagement in learning; dining environments that mirror family meal-time rituals; and the balance of environmental stimuli.

Standard Six: Play – Some of the most important design considerations include: adequate indoor and outdoor space for children to play; accessible, understandable and easy to use outdoor play spaces that are well integrated with the interiors; consider covered outdoor areas; and a range of stimulating spaces and materials that promote communication, encourage problem-solving, critical thinking, and a sense of identify and belonging. Play spaces should also range from unstructured to structured, facilitate solitary and group play, while also maximising interaction with nature. Construct spaces for exploring and investigating; mystery and enchantment; imagination; movement and stillness; interacting socially; moving freely and risk-taking within a safe context.

Standard Eleven: Professional Practice - Provide spaces that promote adult-child interactions to support children’s learning and development; encourage a culture of reflection in the physical environment; and, provide for a flexible environment that acknowledges the role of the early years educator as environmental planner and evaluator.

Standard Sixteen: Community Involvement - Provide settings that are well connected and integrated, and that enhance visibility regarding the setting and the community; make children’s expression visible in the local community and incorporate projects in the setting that are directly linked to concerns in the local community.

Integration and Interface with the community

A number of the Síolta Standards (CECDE, 2006) emphasise the importance of community and societal interaction; for example, Standard 3: Parents and Families, or Standard 16: Community Involvement. For the built environment to support these aspirations it must adopt a relational approach, where the physical environment enables positive relationships between the ELC setting as a whole and the local and wider community. In design and spatial terms this means a setting that is physically well integrated with the locality and that has a permeable, welcoming, and interactive interface or physical boundary with the community. While the safety and security of children is paramount, this must be balanced with the need for relational space that will help underpin the Síolta standards.

UD across key spatial scales can support the Síolta standards and enable and support a diverse range of users

In considering UD and the built environment, it is critical to think about a setting as a whole, to ensure an integrated and coherent approach, but also to consider the key spatial scales so UD is applied across the full spectrum of the built environment. These scales include: (1) ELC setting site location, approach, entry and site layout; (2) Entering and moving about the ELC building; (3) Key internal and external spaces; and, (4) Elements and systems. At all these scales the built environment must be accessible, understandable and easy to use to ensure a continuous 'travel chain' for users of all ages, sizes, abilities and disabilities.

Most importantly though, the ELC setting is a dedicated child-centred environment and this should be reflected in the setting as a whole. While this will differ from one context to another, the setting must facilitate the primary needs of children including play; exploring and investigating; mystery and enchantment; imagination; movement and stillness; interacting socially; moving freely and risk-taking within a safe context.

Supporting inclusive Child Development, Challenge and Learning Provocations

In the discussion of the Síolta standards above, the importance of diverse spaces, interactions and learning provocations was highlighted. Similarly, the Diversity, Equality and Inclusion Charter and Guidelines for Early Childhood Care and Education (DCYA, 2016) calls for ELC settings to challenge and promote the individual child's abilities and development. These issues challenge the built environment to provide an appropriate level of challenge or difficulty for one set of needs or abilities (this might include a three- year-old who needs to climb and jump) while also ensuring an inclusive approach for all children (this might include a child who uses a mobility aid).

Adopting a UD approach and the concept of personalisation is helpful. Personalisation allows enough flexibility and adaptability in a design to facilitate a level of specialisation, should it be required, to suit individual needs.

Co-Design through Participation and Collaboration

UD promotes participatory and collaborative design that not only works with users to understand and incorporate their needs and preferences, but also involves them in the design process in a meaningful manner. Through acknowledging the diversity of users and understanding their needs, a Personalised approach can be facilitated to support inclusive child development and the challenge and learning provocations discussed above, as well as the specific needs of staff and family members, and other visitors.

Furthermore, looking back to the Síolta standards, from the Rights of the Child to the Child and Community Involvement, a philosophy of participation and collaboration is strongly emphasised in all of the standards.

5.3 Conclusion

These findings bring the UD philosophy of inclusion and diversity together with key pedagogical and ELC issues, to help create UD ELC settings that are accessible, understandable and easy to use by children, staff and family members.

The review highlights many positive developments in early childhood policy and illustrates how these not only promote greater inclusion and diversity in the early years context, but also align with the principles of UD.

In terms of pedagogy and ELC, the review draws on the Síolta Standards and identifies the key built environment issues required for a holistic childcare environment. In response, UD issues are then examined across key spatial scales to ensure that the ELC setting as a whole, and at each distinct spatial scale, can facilitate the appropriate levels of accessibility, usability and inclusion that such a diverse environment requires.

The review supports collaboration with stakeholders, including children, around the design of their environment, arguing that children are often excluded from decision making due to a lack of appreciation by adults about their competence to contribute to this process.

Finally, this review shows how UD, in its concern for human performance, health, wellness and social participation, is also a powerful ally to progressive pedagogical philosophies that celebrate childhood and embrace diversity in ELC.

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