Universal Design for Learning and its Role in Ensuring Access to Inclusive Education for All

A Technical Paper by the International Disability Alliance

IDA International Disability Alliance

Inclusive Futures

UKaid from the British people

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Acronyms

3D	Three dimensional
CAST	Center for Applied Special Technology
CRPD	Convention on the Rights of Persons with Disabilities
D4A	Design for all
GC4	General Comment nº4
IDA	International Disability Alliance
MOOC	Massive Open Online Course
OPDs	Organizations of Persons with Disabilities
SDG4	Sustainable Development Goal nº4
ToR	Terms of Reference
UD	Universal Design
UDL	Universal Design for Learning
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USA	United States of America
USAID	United States Agency for International Development

Table Of Contents

1. Executive Summary

This technical paper, commissioned by International Disability Alliance (IDA) as part of its Inclusive Education Flagship initiative, aims to inform IDA's constituency about Universal Design for Learning (UDL). Based on the thematic review of the literature of the last 10 years, this paper aims to clarify the concept of UDL as situated within the broad obligations of fulfilling the right to inclusive education (as defined in the Convention on the Rights of Persons with Disabilities and Sustainable Development Goal nº4).

Universal Design for Learning emerges from the application of Design for All and Universal Design in the field of education. Based on the same principle of accessibility for all, UDL carries the same broad philosophy that human diversity is ordinary and, as such, goods and services need to be created and developed to benefit all persons (including, but not limited to persons with disabilities).

UDL is described as the deliberate design of instruction to meet the needs of a diverse mix of learners, providing all students with an equal opportunity to learn through flexible approaches, and distinguishing between the desired learning outcome and the means of achieving them. It is based on the learning styles theory and is not designed for one particular group of students, but to address the learning needs of a wide-ranging group (Brokop, 2008; CAST, 2018; UNICEF & Johnstone, 2014). Its core tenet is that what is "essential for some" is almost always "good for all" (Meyer et al., 2014).

Universal Design for Learning is based on 3 principles. First, the teaching-learning process must be organized in a way that allows for varied sources of motivation to be activated. The "why" of learning is highly contextual and community-specific and should take into consideration real-life situations that learners can identify with. Second, students should be allowed to represent their learning in a variety of ways. Presenting similar information in different ways – the "what" of learning -, means that students with sensory disabilities, learning disabilities, language or cultural differences have access, helping every student cement their learning and transfer it outside of the classroom. Varying language and symbols will facilitate learning: some students prefer simple words, while others prefer concise and accurate wording; some students will find a graph to be self-explanatory, while others may require a text explanation. Multiplying the ways in which information is presented creates an education process that values understanding, rather than memorization. Third, it follows that differentiating the ways in which students can express their

knowledge and apply their skills – the "how" of learning - means all students will be able to communicate what they learned.

Therefore, in this technical paper, UDL is presented as a framework to support the implementation of the right to inclusive education by focusing on minimizing potential learning barriers and supporting students in mastering their own learning. Teachers who use UDL plan instruction that is responsive to student variability, rather than wait until individual obstacles arise. While UDL does not replace more individualized supports or reasonable accommodations, it provides all teachers and students with an array of possibilities for acquiring or demonstrating knowledge and skills and be motivated and engaged in the learning process.

Importantly, UDL is a critical component of inclusive education, but it is not – in itself – inclusive education. UDL is an important consideration when designing an inclusive education system because it supports a "whole person approach" and learning-friendly environments. UDL is not sufficient to ensure inclusive policy or practices. For an inclusive education system to be comprehensive it must provide a continuum of support measures. UDL fits within the practices and/or services that are available to all students to promote and support learning success (Universal Measures). In addition to these, selective and additional measures must also be available, including the provision of reasonable accommodations.

UDL can be found at the system, school and classroom levels. However, due to its learner-centred and teacher-directed nature, UDL is realized at the classroom level. This allows for planning according to UDL principles to be localized, taking into consideration the characteristics of a specific learning community, and can be independent of policy and budgets. UDL has the potential to be a successful bottom-up intervention that, if properly supported by families and communities, can support the paradigm shift from traditional education systems to inclusive education systems where students learn to learn rather than engage in memorization.

The literature review for this technical paper has revealed that while there are many examples of how policy is addressing UDL development, there are but a few examples of the implication of practicing according to the UDL principles. Even when available, examples of policy related to UDL do not demonstrate how/if policy is impacting practice. Therefore, the given examples should be read with caution as evidence of their success is scarce. This is likely due to the flexibility that UDL can afford a classroom, which makes it difficult to observe and document overtime. In addition, because UDL is student-centred, its success can only be adequately measured by the learner her/himself.

However, and despite a lack of research, there is enough evidence to support the theory that learning about UDL can support teachers in changing the ways in which they view students who struggle with learning or students who learn "differently" within the current context of standardised and 'one size fits all' education system. Therefore, the recommendations from this technical paper are largely aimed at education professionals and civil society:

- Promote UDL as a means to ensure non-discrimination in education.
- Capitalize on the variability and diversity of student population (rather than on the lack of uniformity and individual needs).
- Ensure UDL is part of inclusive education teacher pre- and in-service programmes.
- Utilize UDL as one of the steps in a continuous system of support for inclusive education
- Demonstrate that UDL, accessibility and reasonable accommodations are all necessary features of inclusive education but are not inter-changeable.
- Ensure that civil society organizations have a basic understanding of Design for All/Universal Design and how the principles of DA/UD can explicitly or tacitly expand the reach of their constituencies in practice and advocacy.
- Ensure that civil society organizations can successfully engage, network and support each other and their governments around issues related to Universal Design.
- Train all OPD education focal points on UDL and how it situates within the framework of an inclusive education system.
- Collecting the voices of persons with disabilities who are/ have been educated in environments that have, to some extent, operated under UDL principles. By tapping into their extensive networks, OPDs can fill in one of the most evident gaps in research related to UDL.
- Develop a common set of advocacy messages related to UDL that all OPD representatives can successfully use to advocate for UDL in their context - for all - in addition to their own constituency accommodation requests
- Ensure that civil society organizations can successfully engage, network and support each other and their governments around issues related to Universal Design.

2. Introduction

The International Disability Alliance (IDA) developed, in November 2019, a consensus position amongst its constituency related to the implementation of

Sustainable Development Goal 4 (SDG4). This position was published in a paper produced by the IDA Inclusive Education Team and endorsed by the IDA Board (International Disability Alliance, 2019) - hereafter called "Position Paper". Shortly after, IDA published its flagship report "What an Inclusive, Equitable, Quality Education means to us" (IDA, 2020), clearly establishing its goal of fulfilling the right of every child with disability to inclusive education.

Both documents explicitly mention Universal Design for Learning (UDL) as a tool for inclusion. In addition, many of the points raised by IDA as imperative for an inclusive education can be achieved or facilitated through the use of UDL. In the Position Paper, UDL is specifically mentioned regarding curriculum reform and teacher training, and implicitly in the mention of student diversity (as UDL aims to meet the needs of diverse students) and of a diversity of languages and modes of communication (reflected in the "how" of learning component of UDL) (IDA, 2019). Likewise, in the flagship report, UDL is mentioned directly and implicitly through mentions to accessible and flexible national curriculums that can be tailored to cultural and personal differences, responsiveness to the student's preferences and strengths and usage of multiple languages and modes of communication by all the school community (IDA, 2020).

These IDA documents are aligned with the 2020 Global Education Monitoring Report that focuses on inclusive education (UNESCO, 2020a). Not only is UDL directly mentioned in this report, but it can also be a powerful tool for achieving other results mentioned as essential to reach inclusive education, such as creating flexible curricula, moving towards the identification of barriers, or allowing teachers to offer a range of options for their classrooms.

Following the adoption of its position paper, IDA embarked on the second phase of its Inclusive Education flagship initiative, with the objective to disseminate, broaden ownership of the consensus position, and promote its effective enforcement to transform education systems in diverse settings to become inclusive of all learners, including all learners with disabilities. The broadened Inclusive Education Task Team (with representation expanded from 4 to of 10 members) prioritized UDL as an essential and core component of an inclusive education system to pursue the collective reflection on how to bring to life the position paper, and commissioned the work reflected in this technical paper.

2.1. Aim of the Report

First and foremost, this technical paper aims to inform IDA constituency and partners (among them government stakeholders, policy makers, Organizations of

Persons with Disabilities and others) on what UDL is for, what are its main components, and how can UDL be used as a tool to promote inclusive education. In doing so, key definitions will be included, some of the main pillars of UDL will be explained, and a conceptual and linguistic framework will be provided.

3. Methodology

The methodology used to complete this technical paper is entirely based on a thematic literature review as requested in the assignment's Terms of Reference (ToR, p.2): "to collect, review and analyse information on how UDL addresses the diversity of needs among learners, how it is being implemented in education systems including the gaps; highlight good practices and understand if and how investing in UDL would support in achieving the vision for inclusive, equitable, quality education for all learners including learner with disabilities; and provide recommendations for governments, civil society including OPDs and other actors in the education space". Although most recently highlighted as an important factor in inclusive education, the concept, and theoretical foundations of UDL, are not new. To address the needs expressed in the ToR, a set of criteria was created to bound the desk review and ensure synergies with IDA's mission. Having a clear definition of UDL was considered essential to provide conceptual clarity and evidence of its use.
The literature search procedure was as follows:

- to focus on the thematic literature produced in the last 10 years – ensuring coverage of the Convention on the Rights of Persons with Disabilities (CRPD) and SDG4
- Review of all materials included on foundational websites (CAST, UDL-net, DesignforAll).
- Analysis of literature recommended by foundational websites and related documents – open source
- Analysis of literature published in the last 5 years that counted with the contribution/review of the research team, associates and extended research community
- Search on Google Scholar, Academia and Research Gate for materials published from 2010-2021, using the key words "Universal Design for Learning" and "UDL"

In addition to the criteria described above, the examples included in this publication had to fulfil the below criteria:

- Be explicitly related to inclusive education – inclusive of children with disabilities, but not exclusive to them;
- Indicate (explicitly or implicitly) that the aim of the strategy was to promote the default inclusion of all children in learning, rather than the occasional addition of individualized accessibility measures or accommodations;

- Go beyond the description of an activity to include a potential change in the classroom practice aimed at ensuring access to learning by all students.

The resulting two bibliographic lists (included below) reflect the literature that is included through the narrative (thus, fulfilling the criteria) and that which was reviewed but found not relevant.

A potential limitation of the above methodology is that by narrowing the focus of the desk review to examples of practice that are inclusive of all children, this technical paper does not include attempts at developing UDL that are focused on particular groups of children (e.g., children who are from a linguistic minority; children who are blind) or those examples that were started with the creation of a one-child accommodation and have expanded into UDL, as evidence of this process of transformation was not found.

4. Overview of Universal Design

4.1. What is Design for all?

Design for All (D4A) is "the intervention into environments, products and services which aims to ensure that anyone, including future generations, regardless of age, gender, capacities or cultural background, can participate in social, economic, cultural and leisure activities with equal opportunities" (Design for All Foundation, n.d.). This form of design should be comfortable to users, while benefiting 40 per cent of users and being essential to 10 per cent of the population. It respects the criteria of being respectful, safe, healthy, functional, comprehensive, sustainable, affordable, and appealing.

Developing a product or service for all is based on one of seven strategies(Design for All Foundation, n.d.):

1. Develop a product **to everyone** (i.e., a solution suitable to all users)
2. Develop an **adjustable** product (i.e., that includes devices or mechanisms to meet the requirements of different users)
3. Develop a **range** of products/services, allowing the person to choose which fits her/him best
4. Developing products/services **compatible with common accessories**, guaranteeing usability by persons who use or wear them
5. Develop a **complementary service** to the product/service designed, meeting the needs of more persons
6. Develop **alternative solutions** that offer the same service/benefit
7. Develop a **customized** product or service, such as services provided by doctors or lawyers.

The creation of Design for All, of Universal Design (UD) (see following chapter) and other similar schools of thought (such as Inclusive Design or Human-Centred Design) has been independent, but convergent. Emerging at different points of time and in different areas of the globe, they have similar objectives and recognize the rights "For everyone to access environments, goods and services to the greatest extent possible; For individual and collective differences to be respected; To be able to develop one's potential personally and in the community" (Society for All, 2012).

4.2. What is Universal Design?

Universal design is an approach to architecture that considers the diversity of functional ability as ordinary, encouraging architects and designers to create with a wide range of abilities and body sizes in mind. Universal design addresses the barriers faced by the whole of the population (including, but not limited to, persons with disabilities) and can be applied to any designed good (e.g., building, website, playground, furniture, consumer products). (Steinfeld & Maisel, 2012; UNICEF & Topping, 2014).

This approach is performance-based, addressing usability issues for all and benefitting all users. It has eight goals (Steinfeld & Maisel, 2012):

- Body fit: accommodating a wide range of body sizes and abilities
- Comfort: keeping demands within desirable limits of body function and perception
- Awareness: ensuring that critical information for use is easily perceived
- Understanding: making methods of operation and use intuitive, clear and unambiguous
- Wellness: contributing to health promotion, avoidance of disease and protection from hazards
- Social integration: treating all groups with dignity and respect
- Personalization: incorporating opportunities for choice and the expression of individual preferences
- Cultural appropriateness: respecting and reinforcing cultural values and the social and environmental contexts of any design project

4.3. Why is Design for All / Universal Design Important in Disability-Inclusion Work?

Accessibility is central to inclusion and an obligation under the Convention on the Rights of Persons with Disabilities, being one of its general principles (United Nations, 2006). As mentioned above, D4A and UD approach functional differences as inherent to human diversity and to society. By including variability and diversity into the design and construction of infrastructure, products and services, these approaches reduce the number of barriers for all persons, including persons with disabilities (UNICEF & Topping, 2014). Disability-inclusion work should strive to be as barrier-free as possible – utilizing these frameworks can help in achieving that. Creating a universally designed product, infrastructure or service can sometimes mean increasing the initial price of development, but studies have shown that

conceptualizing accessibility from the start is considerably more affordable (approximately 1 per cent increase in cost) than retrofitting existing products, infrastructures or services (5 per cent or more of construction costs) (Snider & Takeda, 2008; UNESCO, 2020a).

Furthermore, the costs of excluding persons with disabilities is much, much higher than the cost of accessibility – "not only does exclusion create a significant economic burden for individuals and their families, but it can also carry substantial costs to societies at large" (Banks & Polack, n.d.). Logically, always including persons with disabilities and enabling access to products, infrastructures and services will lead to great gains in any society – be it financial, social, cultural.

4.4. Examples of Design for All

The Design for All Foundation (Design for All Foundation, n.d.) hosts annual "Good Practices Awards", that "recognise achievements in the field of design for all, great and small, by governments, businesses, not-for-profit organisations and professionals from all over the world" that contribute to improve the quality of life for **everyone**. This is not a definitive list of all good practices, but a starting point for anyone wanting to learn more about how to design with everyone in mind. Some exemples are:

1. The augmented accessibility project, ongoing since March 2017, in the Vilamuseu in Vila Joiosa (Spain) created three-dimensional (3D) printed copies of key pieces of their museum collection to improve accessibility, pairing them with accessible interpretive information (see http://designforall.org/morecandidate.php?id=626 for more information).
2. A project developed by the Austrian Post and the Keba AG company improved accessibility for all to mail deposit boxes by retrofitting their automated machines to allow for information to be accessed both in-screen or through speakers/headphones (see http://designforall.org/morecandidate.php?id=622 for more information).
3. In France, the "Good Design Playbook" was produced to answer the question "How to design everyday products and services accessible to all?", based on a case study of an essential practice – cooking. Persons with disabilities collaborated in each phase of the study and guide development, in an approach that can be used for multiple activities and sectors (see http://designforall.org/morecandidate.php?id=643 for more information).

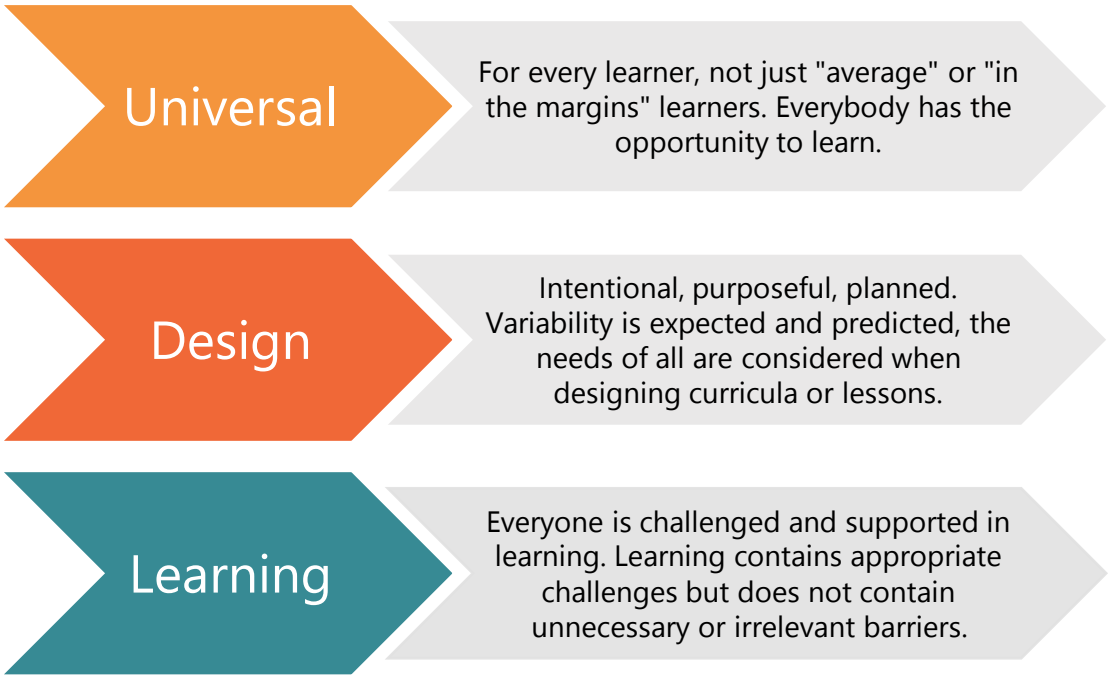
5. UNIVERSAL DESIGN FOR LEARNING

5.1. What is Universal Design for Learning?

Universal Design for Learning (UDL) – originated from Universal Design - is the **deliberate design of instruction to meet the needs of a diverse mix of learners, providing all students with an equal opportunity to learn through flexible approaches, and distinguishing between the desired learning outcome and the means of achieving them.** It is based on the learning styles theory and is not designed for one particular group of students, but to address the learning needs of a wide-ranging group (Brokop, 2008; CAST, 2018; UNICEF & Johnstone, 2014). Its core tenet is that **what is "essential for some" is almost always "good for all"** (Meyer et al., 2014).

UDL is a methodological option that guides the general measures that all students should benefit from, structuring and guiding the creation of accessible and effective learning environments for all students (Pereira et al., 2018). Figure I unpacks the meaning behind Universal Design for Learning (Meyer et al., 2014).

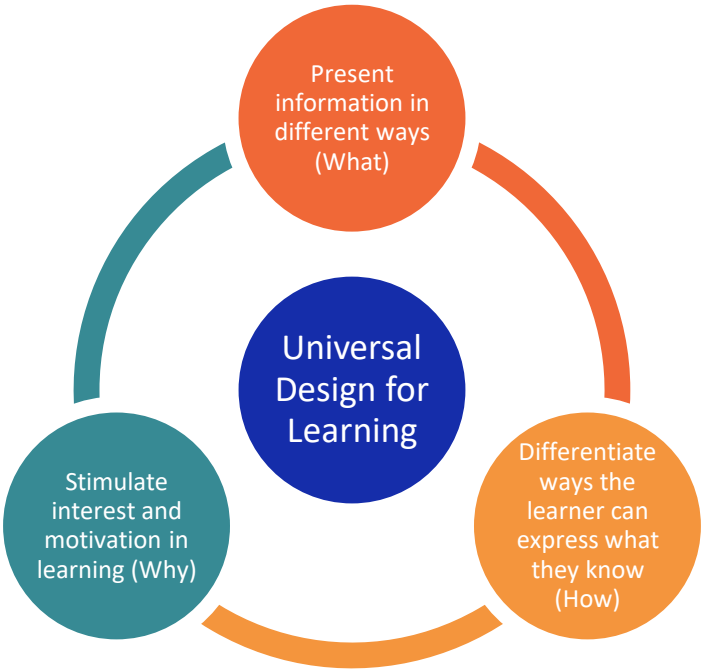
Figure I - Universal Design for Learning



The key concepts of Universal Design for Learning are presented in Figure II, representing the "what", "how" and "why" of education (CAST, 2018; Hayes et al., 2018).

According to UDL, **all members of the community start with high standards for** and apply flexible means to present information, stimulate interest in the learner and for the learner to express what they know, finding appropriate learning challenges and supports.

Figure II - Key concepts of UDL



The learner is at the centre of education, not a fixed curriculum (Meyer et al., 2014).

Universal Design for Learning is a powerful framework to operationalize the right to education, supporting educators in maximizing desirable challenges (in a way that they boost learning for every student) and minimizing unnecessary difficulties (such as those that prevent access to education). It helps create contexts that optimize opportunity for all and is more cost and time effective, in the long run, than altering or adapting curricula, courses or materials after their creation (Brokop, 2008; Meyer et al., 2014).

When teachers expect and plan for variability among the student population, the need for more intense individually tailored supports is minimized. Because UDL is meant to support and take advantage of variability and diversity in the classroom, the need to identify students' needs as related to a potential impairment is also minimized. Thus, rather than planning teaching and learning around an impairment-

specific set of accommodations, UDL incentivizes a transformative way of planning that can adapt to the inherent variability in the classroom. As described in the examples below, this does not translate into more work for teachers, school or systems, neither does it replace reasonable accommodations as may be needed some learners.

5.2. Universal Design for Learning and Inclusive Education

Inclusive education is defined in the Convention on the Rights of Persons with Disabilities and its' General Comment No. 4 on the Right to Inclusive Education (GC4). Compliance with both of these documents has become a driving force for educational reform, especially in Europe and with examples such as Malta, Cyprus and Portugal (Hunt, 2017).

According to the General Comment No. 4 (Committee on the Rights of Persons with Disabilities, 2016), **inclusive education involves strengthening the capacity of the education system to reach out to all learners and focuses on the full and effective participation, accessibility, attendance and achievement of all students, especially those who are excluded or at risk of being marginalized**. It requires an in-depth transformation of education systems in legislation, policy, and the mechanisms for financing, administration, design, delivery and monitoring of education. In addition, it is to be understood as:

a) A fundamental human right of all individual learners (NOT the right of a parent or caregiver);

b) A principle that values the well-being of all students, respects their inherent dignity and autonomy, acknowledges individual requirements and ability to effectively be included in and contribute to society;

c) A means of realizing other human rights, as it is the primary means by which persons with disabilities can lift themselves out of poverty, obtain the means to participate fully in their communities, and be safeguarded from exploitation.

d) the result of a process of continuing and pro-active commitment to eliminate barriers impeding the right to education, together with changes to culture, policy and practice of regular schools to accommodate and effectively include all students.

There are nine core features to inclusive education (Committee on the Rights of Persons with Disabilities, 2016):

1. Is **based on a "whole systems**" approach, where all resources are invested in advancing inclusive education. Inclusive education is not limited to a line in the education budget or a department within the ministry but rather it is the main philosophy and policy landscape leading the government's vision.

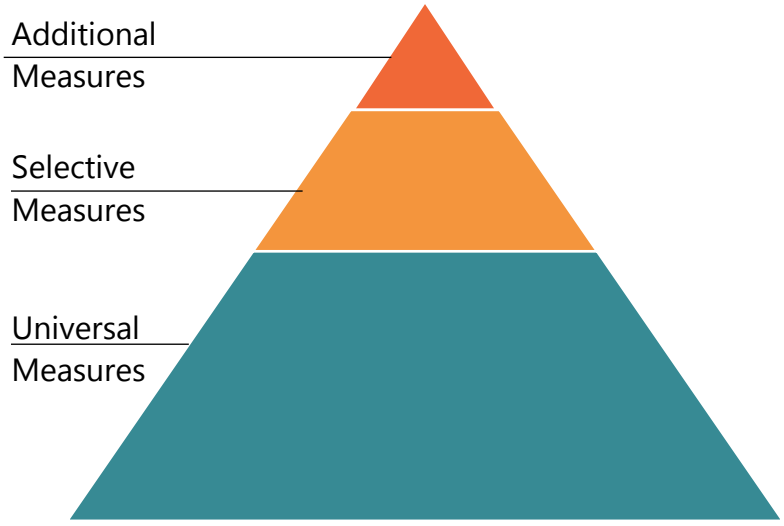
2. **Recognizes that a "whole educational environment**" effort is needed to embed inclusive education within culture, policies and practices of the whole education system. Inclusive education goes beyond legislation and becomes the *ethos*[1] for the system. It requires that all enabling environments recognize, respect and promote diversity and equity as the pillars of citizenship.
3. Is **centred on a "whole person" approach** in which recognition is given to the capacity of every person to learn, and high expectations are established for ALL learners. Inclusive education offers flexible curricula and teaching and learning methods adapted to different strengths, requirements and learning styles. The focus is on ALL learners' capacities and aspirations, rather than on content when planning teaching activities.
4. Is set on a cadre of **supported teachers for ALL students.** There are no regular teachers for regular students and no special teachers for special students. In an inclusive education system, ALL teachers and other staff receive the education and training they need to give them the core values and competencies to accommodate ALL students in inclusive learning environments. ALL teachers are responsible for ALL students and work collaboratively with administrators, specialists, and other professionals (within and outside the education system).
5. Inclusive education systems are created on the pillars of respect for, and value of, **diversity.** ALL members of the learning community – regardless of their personal characteristics - are equally welcome and must be shown respect.
6. Teaching and learning occur in **learning-friendly environments** that are accessible, where everyone feels safe, supported, stimulated and able to express hers/his ideas.
7. **Effective transitions** are essential in guaranteeing a life-long approach to education. All learners, but in particular learners with disabilities, shall receive support to ensure the effective transition from learning at school to vocational and tertiary education and, finally, to the world of work.
8. Inclusive education must be respectful of the relationship between the learning environment and the wider community. **Partnerships** (within, across and beyond the school walls) sustain inclusive education and must be recognized as the route towards inclusive societies.
9. **Monitoring** of inclusive education must involve the most important stakeholders: learners - including those with disabilities – and those who represent them.

With this framework in mind, we can now look at **where Universal Design for Learning fits in an inclusive system**. More specifically, we can pinpoint its presence in two of the core features of inclusive education:

- A "whole person" approach (feature 3) is dependent on flexible curricula and teaching-learning methods that are adapted to a wide diversity of learners (Hunt, 2017) – Universal Design for Learning provides a solid framework for policy makers to create accessible curricula and for teachers to create variety in the way students interact with knowledge, with a focus on each learner's capacities and aspirations (instead of focusing on content).
- UDL promotes learning-friendly environments (feature 6) by allowing students to choose effective pathways to acquire and express knowledge that motivates them to maintain focus and to seek further learning (Hunt, 2017). This doesn't only affect students – using UDL, teachers create a better understanding of students capacities, a higher degree of confidence in student's abilities, engaging and accessible classrooms environments and a focus on achieving educational outcomes for all children, including children with disabilities (UNICEF & Johnstone, 2014).

Universal Design is useful to, but does not equal, inclusive education. In the same way, it is not an alternative to reasonable accommodation (Brokop, 2008), differentiated instruction (Alsalamah, 2017), support services or assistive devices, but a framework that can include their application.

Figure III- Tiered levels of support



In inclusive education, learning support is realized in **a continuum of measures available to all, to each and every student.**

One of the ways to systematize the range of supports is by classifying them in three tiers or levels (e.g., multi-tiered support, support pyramid) (Pereira et al., 2018; SWIFT Education Center,

2021). These classifications, such as the one shown in figure III, differentiate between Universal, Selective and Additional Measures to support learning, based on the type, the frequency, or the duration of the support.

Universal Measures (UDL)

An inclusive education system will provide **Universal Measures**, including practices or services available to promote learning and success to ALL students (Pereira et al., 2018). The aim is to think of which supports should be consistently available across all learning environments (SWIFT Education Center, 2021) to support learner excellency. It is at this level that the implementation of Universal Design for Learning is recommended – that is, **UDL is a framework to provide universal measures of support.**

Classroom planning techniques such as UDL underpin inclusive practice (Rose, Gravel, & Gordon, 2014). By designing into the lesson learning options available to any student who finds them helpful, teachers develop curricula that accommodate the diverse strengths and challenges of all learners, minimizing the need for additional adjustments (Faragher et al., 2020). Additionally, UDL is not in conflict with other pedagogical methods and practices but it is meant to incorporate and support research-based approaches to teaching and learning, such as collaborative learning, blended learning, multisensory teaching, and student-centered learning (Breed, 2019).

UDL can also support implementing practices that are innovative such as those where a team of deaf and hearing teachers provide simultaneous instruction in sign language and spoken language to classrooms of deaf and hearing students (Lamothe, 2017 & Tang et al., 2014) in (World Federation of the Deaf, 2018). In this case, UDL supports research that, over the past several decades, shows that full and prolonged exposure to a sign language (regardless of whether a child is deaf or hearing) results in language and cognitive development that follows the same patterns and produces the same developmental results as exposure to a spoken language does for a hearing child (Courtin 2000, Mayberry et al. 2011, Woolfe et al. 2002) in (World Federation of the Deaf, 2016);

Selective Measures

For students that continue to face difficulty in participating or succeeding in the learning process, even with robust Universal Measures in practice, **Selective Measures can be considered in addition to** the universal measures already in place. These can be designed for individual students or small groups of students who need

similar support and should be provided, as much as possible, within the daily schedule and spaces of the classroom (Pereira et al., 2018; SWIFT Education Center, 2021).

It is at this level that we may find, for example, tutoring, re-teaching, additional opportunities to practice a concept, and other differentiations or adaptations that do not compromise learning of essential competencies, but universal measures such as UDL could not fully achieve.

Additional Measures

At the third level, support is boosted by **adding additional measures to the already in-place universal and selective measures**. This type of support is of a more individualized and intensive nature, designed to be adapted to each students' abilities and needs, and is usually provided individually or in small groups. Multidisciplinary teams, of which the student and parent are an integral part of, evaluate, plan and implement these supports. Evaluation of implementation should be done regularly, follow the regular curriculum and allow for a reduction of support level whenever possible (Pereira et al., 2018; SWIFT Education Center, 2021).

Reasonable Accommodations

While Universal Design for Learning and other support measures reduce the need for most individualized supports – improving learning for all, while maintaining the dignity of students in the classroom by not making them ask for supports - it will not necessarily eliminate the need for reasonable accommodations (e.g., extra time for exams, sign language interpreters or differentiated materials) (Brokop, 2008). Some children, including some children with disabilities (especially those with complex and/or severe impairments), require reasonable accommodations to be able to participate in education on an equal basis with others. Provision of reasonable accommodation is required by the Convention on the Rights of Persons with Disabilities (United Nations, 2006) and is part of education law of several countries.

According to the CRPD, reasonable accommodation "means necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms" (UN, 2006).

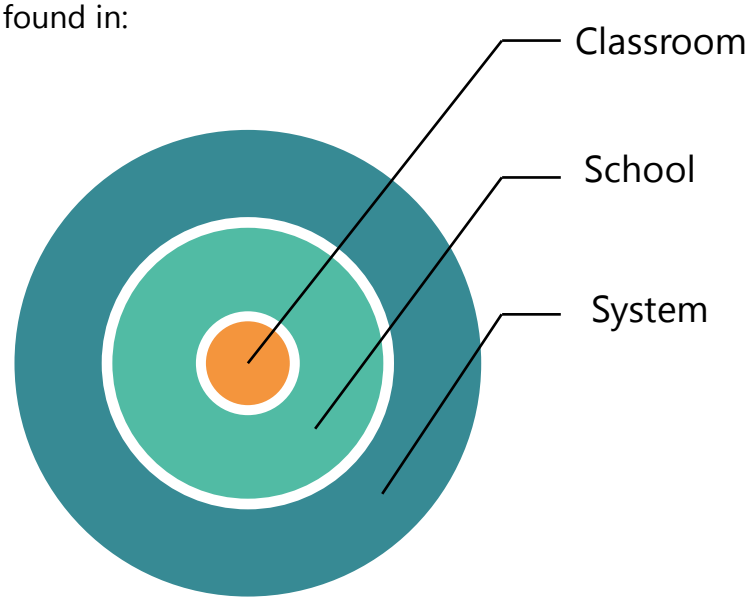
Therefore, UDL must be understood as a foundational support strategy to ensure access and participation in learning by all students, independently of the level of support any particular child may have. However, **regardless of how robust UDL is, equity in education will require that selective and additional measures be available to all learners, as needed, including reasonable accommodations.**

5.3. What are the Main Features of Universal Design for Learning?

Within inclusive education, UDL is a systemic priority. It can be applied to more than one context, namely to the classroom, school practice or overall education system.

Figure IV: UDL Levels

UDL can be found in:



However, **UDL is ultimately realized at the classroom level.** Teachers who develop a variety of methods to teach, use various materials, and assess learning in different ways are providing opportunities for ALL students to practice skills (United Nations, 2006) and are engaging in teaching and learning according to UDL principles. Because it is **learner-centred, teacher-directed and realized at the classroom level, UDL can be implemented independently of policy environments or budgetary constraints.** Adequate teacher capacity, learner engagement and family and community support and are the core of UDL and present inclusive education advocates with a good opportunity to empower learners and communities to be directly involved in system change.

Importantly, UDL is student-centred and aims at supporting each and every learner in **becoming an expert in their own learning**. Within this framework, expert learners are not those who excel at a specific subject or evaluation type, but those who excel in their own learning process. **Expert learners can select and modify the strategies that work for them, are motivated to learn and know when and where to look for help.** Expert learners possess characteristics developed by each of the three principles of UDL (explained below): they master the "why" of learning by being purposeful and motivated; the "what" of learning by being resourceful and

knowledgeable; and the "how" of learning by being strategic and goal directed. UDL is realized in each learner reaching (its own) expert level (Meyer et al., 2014).
Thus, from an equity perspective, an essential feature of establishing an inclusive classroom is to **begin with the assumption that all learners can learn** (Toson et al., 2012), that **all are welcome and belong** (Swinton, 2012) and that teachers have a powerful influence on the inclusive culture of the classroom. UDL presents teachers with the opportunity to take control of inclusion, rather than be passive recipients of policy. Teachers become responsible for inclusion – as learners "without disabilities are more likely to feel positively toward classmates with disabilities if their teachers do, as teacher attitude partially mediates peer acceptance" (Silverman, 2007, p. 42) in (Faragher et al., 2020).
In addition, **UDL takes full advantage of how much teachers know about their own students** and allows them to tap into the talents of all learners. Consideration of the individuals that make up the class leads teachers to making decisions about grouping, furniture arrangement and timings, over and above the planning of the learning activities. Effective classroom management involves prior planning and designing activities that will support the attainment of the learning goals for the lesson (Faragher et al., 2020).
UDL is organized around three principles: to provide multiple means of engagement (the "why" of learning" - stimulate interest in the learner and motivation for learning); to provide multiple means of representation (the "what" of learning - present information and content in different ways) and to provide multiple means of action and expression (the "how" of learning - differentiate the ways that students can express what they know) (CAST, 2018; UNICEF & Johnstone, 2014). Providing all three simultaneously will aid inclusive education, by creating diversity in the way students engage with the teaching-learning process, accommodating individual learning differences and styles by making use of flexible learning environments. **UDL improves learning outcomes for all children, including children with disabilities, by moving away from a "one-size-fits-all" approach and validating the way(s) in which students engage in, participate and express learning** (United Nations Children's Fund, 2019).

The "Why" of Learning

To provide multiple means of engagement aims to develop learners who are purposeful and motivated by providing options that increase buy-in and keep them interested, allowing them to regulate their emotional state and help in sustaining effort in a task, persisting in the learning process (CAST, 2018). To achieve this,

teachers must organize the teaching-learning process taking into consideration multiple options that engage and motivate their students (Pereira et al., 2018). The "why" of learning is highly contextual and community-specific and should take into consideration real-life situations that learners can identify with. Thus, the "why" of learning for students in a small fishing village is likely to be different than the "why" of learning for students in a large city, even if they are both using the same curriculum. However, there is a high probability that some learners in a city will also be interested in fishing, and learners in the village be interested in urban development; teachers need to consider the overall context and the individual interest of their learners.

The "What" of Learning

To provide multiple means of representation aims to develop learners who are resourceful and knowledgeable by providing options for perception, comprehension and language and symbols (CAST, 2018). As students differ in how they understand information, there is no ideal means of representation that fits every student – in any given class, students will differ in their background, in how they understand information and in how they prefer to access and process information (Pereira et al., 2018).

Presenting similar information in different ways, means that students with sensory disabilities, learning disabilities, language or cultural differences have access, helping every student cement their learning and transfer it outside of the classroom. Varying language and symbols will facilitate learning: some students prefer simple words, while others prefer concise and accurate wording; some students will find a graph to be self-explanatory, while others may require a text explanation. Multiplying the ways in which information is presented creates an education process that values understanding, rather than memorization, and that sets the proper steps for students to transform information into knowledge and skills (Hayes et al., 2018; Katz, 2013).

The "How" of Learning

To provide multiple means of action and expression aims to develop learners who are strategic and goal-directed, by providing options for physical action, executive functions (such as goal-setting or strategy development) and expression and communication (CAST, 2018). Differentiating the ways in which students can express their knowledge and apply their skills means all of them will be able to communicate what they learned (Hayes et al., 2018). For example, writing may be

hard for students with movement limitations, and students with difficulty in organizing their learning may benefit from other learning supports. It is important that the way action and expression is allowed during classes is reflected in the assessment process, both in the way students interact with learning and in the way they show what they have learned.

The Importance of Universal Design Learning

UDL is particularly important when planning for inclusive education systems that are forward-looking and concerned with responding to the needs of the 21st century. Flexibility, capacity to adapt to change, engagement, innovation and team work – the foundational skills of a society that values inclusion and technology integration – cannot be taught in the traditional classroom settings that are set in inflexible curriculums and old-fashioned practices, and require learner-centred instruction that foster different ways of expressing and communicating knowledge (Singh & Hassan, 2017). In addition, traditional education systems are struggling to keep up with the speed at which new skills are required, **making "learning to learn" more important than learning static skills** that might not be relevant by the time a student graduates(González-Salamanca et al., 2020).

5.4. Examples of Universal Design Learning in Policy and Practice

In **Armenia**, the application of UDL by a history teacher was followed and documented. Application of UDL was found to be highly contextualized, which the authors claim is the norm or applying UDL to any new context. This teacher's choice of activities (Avagyan, n.d., 2017a, 2017b, 2017c) was representative of the curriculum, of the strengths and needs of her students, and of her own beliefs towards teaching. In addition, they were applied and changed in accordance with the changing day-to-day of the classroom (Avagyan et al., n.d.).
In a **Canadian** University, UDL was used to inform and guide the internal evaluation and transformation of the Office for Students with Disabilities. The staff analysed their daily practices and procedures against the principles of multiple means of representation and multiple means of engagement, identifying barriers to access. For example: They removed print-based communication requirement and made it a web-based service compatible with adaptable software; offered the possibility of meeting with advisors via Skype instead of in-person. Not only have many of the office's practices changed in response to this initiative (leading to higher levels of student participation in exams, higher usage of advisor hours by students and

creation of multiple means of submitting forms), but even the office's name and target population was altered, reflecting more inclusive values. The now named **myAccess** expanded beyond targeting users defined by narrow diagnostic labels of disability to any students that faces barriers in their interaction with the university. Several other units on campus have started similar processes, inspired and motivated by this first successful transformation (Beck & Fovet, n.d.).

CAST's book builder tool (see http://bookbuilder.cast.org/), that allows anyone to create, share or utilize books constructed using the UDL framework is a good practice example. This tool, created in 2006, offers model books and public library connections, as well as the freedom for teachers, educators, parents or other to create their own accessible books. The approach is more bottom-top in this case, as it started mostly as a tool for educators. However, it has been assisted in expanding a UDL framework to schools and larger educational systems (such as district systems in the United States of America and Canada)(Meyer et al., 2014).

In **Colombia**, the decree 1421 of 2017 promoted UDL as a way of creating accessible curricula for persons with disabilities, reinforcing that it would not exclude any other supports needed by the learner (UNESCO, 2021a).

In **Costa Rica**, according to the Decree no. 40955 of 2018, inclusive education implies the access to a quality education for all, including those with disabilities. This requires curricula to be created based on Universal Design for Learning, so they allow for personal and social development towards a true inclusion of persons with disabilities(UNESCO, 2020c). The ministry of education's website includes an online course on Universal Design for Learning (see https://www.mep.go.cr/educatico/diseno-universal-aprendizaje).

Ghana's Inclusive Education Policy (Government of Ghana, Ministry of Education, n.d.) mentions that UDL "should be adopted in all schools to promote participation of all learners", as is mentioned as endorsing the UDL approach by UNESCO (UNESCO, 2021b).

In the state of **Maryland, United States of America (USA)**, advocacy from the Maryland Down Syndrome Advocacy Coalition, in partnership with the National Down Syndrome Society, led to the implementation of UDL. After learning about UDL, they reached out to parents' groups, to the Maryland State Department of Education, to education leaders, to school boards, to teachers' unions and to elected officials. They developed a website and brochure and built a coalition spanning through all education levels. This led to the creation of a state Task Force that started the process of implementing UDL across the state. At the University Level, UDL principles have been embedded into education and future teachers are being trained to use it in their classrooms. Implementation in school districts is underway,

with support from national grants, CAST and a statewide UDL network created to be a professional learning community (DeCoste et al., n.d.).

The **New Zealand** education system endorses Universal Design for Learning as a way to design learning environments that are flexible and barrier-free, considering at non-prescriptive and flexible learning approach that enables recognition of students differences (Ministry of Education, New Zealand, 2018; UNESCO, 2020b). The UDL framework is perceived as allowing an understanding of learner variability in teaching-learning practices, the identification and removal of barriers to learning, collaboration through shared language and evidence-based approaches, a guided and deliberate innovation in inclusive design and the realization of the curricula in a way that promotes inclusion (Ministry of Education, New Zealand, 2018). The education system website has an entire section dedicated to UDL – what it is, why it is useful, what are its components and how it can be applied in the classroom. It includes extra resources and tips on how educators and schools can apply UDL to their unique contexts.

In **Paraguay**, the approval of the Ley N.° 5.136/13 de Educación Inclusiva (Law N.º 5.136/13 on inclusive education) was followed by the construction of a guide by government, United States Agency for International Development (USAID), OPDs, Civil Society for its application, where UDL is mentioned as one of the methodological strategies recommended towards achieving inclusive education in each classroom. This guide will serve as the foundation for training personnel and turning the law into practice.

In **Portugal**, the Law decree 54/2018 on inclusive education mentions Universal Design for Learning as one of the underlying methodological options to the Portuguese curriculum (Decreto-Lei no. 54/2018 de 6 de Julho). In the Practice Support Manual (Pereira et al., 2018), issued briefly after the law came into effect, it is recognized that each student learns differently and, therefore, a singular curricular approach will not allow learning opportunities to every student. The two Massive Open Online Courses (MOOC) designed by the ministry to aid teachers in their grasp of inclusive education include overviews of Universal Design for Learning, mentioned as one of the guiding principles to the roll out of inclusive education (see https://www.dge.mec.pt/noticias/educacao-inclusiva/mooc-educacao-inclusiva and https://www.dge.mec.pt/noticias/educacao-inclusiva/mooc-tecnologias-para-inclusao-e-acessibilidade).

A teacher in **Tanzania** created tactile models of the urinary system to aid students (some of which were children with visual impairments) access content (UNICEF & Johnstone, 2014).

Another initiative with a similar product is the **UNICEF** initiative "Accessible Textbooks for All" (see https://www.accessibletextbooksforall.org/) created accessible digital textbooks – "a digital tool that gives all learners, including those with disabilities, access to information in alternative accessible formats, like narration, sign language video, interactivity, the audio description of images and other, to suit different preferences, learning styles or access needs" (United Nations Children's Fund, 2019). These textbooks have been developed with the UDL framework in mind and piloted in several countries (**Kenya, Paraguay, Nicaragua, Uganda, and Uruguay**).

6. Analysis of Findings

Universal Design for Learning is, from an experimental viewpoint, hard to evaluate – many of the outcomes are difficult to measure and application cannot be standardized. In fact, the flexibility that UDL provides makes it elusive to analyze. Nevertheless, anecdotal evidence and case-studies are available and point to a more effective, pleasurable and demanding educational experience for both students (with and without disabilities) and teachers (Canter et al., 2017; Meyer et al., 2014; Spencer, 2011). A study that evaluated 12 articles (peer-reviewed and published between 2012 and 2015) on UDL adoption found that framework implementation yielded positive results in eleven of these cases (Al-Azawei et al., 2016), further pointing towards the validity of this framework.

A main take-away from the present research, that confirms findings from others (Avagyan et al., n.d.), is that while there is plenty of evidence related to teaching **about** UDL, there is **little evidence about the practical results** and value of using such an approach. However, implementation of programmes (at classroom, school, system levels) *should be easy to measure* against UDL principles. As the principles themselves indicate, *measuring* UDL success cannot be done against performance indicators; rather, **UDL success can only be analysed by comparing learner empowerment, engagement, and success in the learning process pre- and post-UDL planning**. Moreover, *measuring* UDL success is a reflective process that should be, as the principles themselves, learner-centred. Thus, UDL success will not be accounted for in exams or indicators as we know them, but rather in student satisfaction and personal attainment of life goals.

All the examples given above can be sustained. However, replication is more difficult to identify due to the specific characteristics of each context in which the UDL practices have developed. As with many other education-related theories, practices and approaches, caution is required as well as a thorough analysis of the existing contextual factors and aims when replicating examples (Steiner-Khamsi & Waldow, 2012).

6.1. Lessons-Learned

The first lesson to be learned from this research is that data on the practical value of UDL is scarce since most of the available literature focuses on the principles of UDL without providing a description of practice that includes a formative evaluation piece. Also, as mentioned above, a summative evaluation will not suffice in demonstrating UDL's value. Most investigations consulted do not look at the

practice of UDL from a participatory, results-oriented investigative approach (Avagyan et al., n.d.). When considering the success of the application of UDL methods it would be important to document learner-centred progress overtime and record in the first-person how learning has evolved (i.e., how the learner has become an expert). Only the learner can assess if/how their own learning has evolved overtime with the supports provided by UDL.

The implementation of UDL can happen at multiple levels of a system, as discussed above, which means advocacy can also happen at all levels of the system. As exemplified in Maryland (see above), advocacy can have a powerful impact in changing the education system at all levels. This example shows the importance of reaching out and sensitizing the greatest number of stakeholders possible.

Above all, UDL advocacy should focus on the local level - reaching out to schools or teachers' unions can prove useful to boost training – as mention in the flagship report (IDA Inclusive Education Task Team, 2020), pre-service and in-service training is essential for teachers to be supported in applying UDL and in making sure all students can participate and succeed in learning. A 2018 study found that providing training in UDL can also have a strong positive impact in how teachers perceive disability and how they support students with disabilities in the classroom (Lanterman & Applequist, 2018). These documents speak of the important role teachers, and teacher education, play in shaping education. Even where more systemic change is not possible, **sensitizing even one teacher can have a huge impact in the lives of all the students that pass through that classroom – and help create examples of success to aid advocacy efforts.**

Where feasible, advocacy can also target providers of learning materials. As the examples from UNICEF's Accessible Textbooks for All and CAST's Book Builder projects show, learning materials developed with UDL concepts are designed to be inherently accessible to all students. Using a user-centred experience following UDL principles assist learning outcomes for all students. To achieve a more inclusive education system, "all learning materials should be born accessible" (United Nations Children's Fund, 2019) – applying UDL principles in their development helps achieve that goal.

A last lesson we can take from research is that cost is often used as an excuse to applying UDL to classrooms, schools, systems, or products. However, as is the case with Universal Design, planning in advance and designing with inclusivity in mind from the onset is cost and time effective (Brokop, 2008). The financial costs of training teachers, providing accessible learning materials or reformulating the curriculum with UDL principles in mind will be counter balanced by reduction in the need of specific accommodations, remedial courses or class repetition, not to

mention the long-term financial gain of a system that creates adults who are adaptable, know and love to learn, who are in-sync with the skills needed for the 21st century and where all contribute to the society (Banks & Polack, n.d.). Developing a system, school or classroom that is steeped in UDL principles is not necessarily a question of increasing a financial budget. While there are a few selective and additional measures that might have a cost, many of the strategies that can be used in a classroom that follows UDL principles are free. With strong motivation, creativity and support all teachers can make tools and strategies available for all students (rather than piece-meal individual accommodations) such as break cards, flipped classrooms, a visual schedule, modified text, sensory-motor prep activities, book page-turners, modified rules, transcripts, assisted reading, and dozens of others.

7. Recommendations

7.1. For Governments

- **Demonstrate how it is possible and desirable** to produce higher impact with fewer resources and how these more efficient actions avoid discrimination at the same time.
- **Demonstrate how services that are provided along the life cycle** reduce waste, energy and the use of financial resources while better addressing the needs of all individuals.
- **Develop city strategic policies and actions** that do not require big economical efforts but rather capitalize on a paradigm shift among politicians and civil servants, aiming for the improvement of life conditions for all citizens and visitors.
- **Invest in the development of participative processes of change and improvement** that engage the citizens in their design and dissemination (Design for All Foundation, n.d.).

7.2. For Education Policy Makers

- Ensure all members of the educational community promote equal opportunities to access to educational activities for all students (non discrimination).
- Consultation and meaningfully involvement of families is necessary when promoting inclusive education and UDL.
- Distinguish between Design for All (as a tool to ease access to basic education and lifelong learning despite individual differences) and differentiating instruction according to the characteristics of a particular group (Design for All Foundation, n.d.).
- Explicitly advocate for UDL within teacher training (pre- and in-service- UDL is a feature of inclusive education that can only be successfully implemented in conjunction with other features. UDL requires trained teachers that can be flexible in the ways they get their students to reach the appropriate goals. (based on Meyer et al., 2014).

7.3. For Education Professionals

- Utilize UDL principles as a whole-classroom strategy and not as a differentiation method.
- Demonstrate that UDL, accessibility and reasonable accommodations are all necessary features of inclusive education but are not inter-changeable.
- Collaborate with other professionals to learn about UDL and apply it in the classroom. Because it requires creativity and a deep understanding of pedagogy, the practice of UDL will evolve over-time with teaching experience. When possible, pair novice and experiences teachers in developing UDL strategies.

7.4. For Civil Society

Despite their varied aims, civil society organizations (unions, humanitarian, political, professional, cultural, ecological, Non-Governmental Organizations, etc.) play an important role in Design for All. Their objectives and core features - respect for diversity, ethical values, equality, solidarity or fighting for individual rights - are usually aligned with Design for All (Design for All Foundation, n.d.):

- Ensure that civil society organizations have a basic understanding of Design for All/Universal Design and how the principles of DA/UD can explicitly or tacitly expand the reach of their constituencies in practice and advocacy.
- Ensure that civil society organizations can successfully engage, network and support each other and their governments around issues related to Universal Design.

7.5. For Organizations of Persons with xisabilities and IDA Membership

As detailed in the Flagship Report, "all OPDs have a role to play in policy development, accessibility advisory, effective implementation, teacher preparation, parent support, providing psycho-social support, etc." (IDA Inclusive Education Task Team, 2020, p.37)

- Ensure that all OPDs have a basic understanding of Design for All/Universal Design and how the principles of DA/UD can explicitly or tacitly expand the reach of their constituencies in practice and advocacy
- Train all OPD education focal points on UDL and how it situates within the framework of an inclusive education system
- Collecting the voices of persons with disabilities who are/have been educated in environments that have, to some extent, operated under UDL principles.

By tapping into their extensive networks, OPDs can fill in one of the most evident gaps in research related to UDL.

- Develop a common set of advocacy messages related to UDL that all OPD representatives can successfully use to advocate for UDL in their context - for all - in addition to their own constituency accommodation requests
- Ensure that civil society organizations can successfully engage, network and support each other and their governments around issues related to Universal Design.

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