

A network of peers and practices for addressing Learner Variability: UDLnet

Katerina RIVIOU^{a,1}, Georgios KOUROUPETROGLOU^b and Nikolaos OIKONOMIDIS^b

^a*Ellinogermaniki Agogi, Athens, Greece*

kriviou@ea.gr

^b*Speech and Accessibility Lab., Department of Informatics and Telecommunications, National and Kapodistrian University of Athens, Greece*

koupe@di.uoa.gr

Abstract. Grounded on new research in neuroscience and the Design for All principles, Universal Design for Learning (UDL) constitutes an educational approach that promotes access, participation and progress in the general curriculum for all learners. The difficulty is in all cases translating the UDL principles and guidelines into practice. Though the UDL policy context supports a shift to inclusion, professionals need more support to develop their practice. In order to bridge the gap between policies and practice the UDLnet network aspires to address this necessity collecting and creating good practices under the framework of Universal Design for Learning. This paper presents the UDLnet project, its aims, the methodological framework, as well as the envisaged themes. UDLnet is a European network that aims to contribute to the improvement of teachers' practice in all areas of their work, combining ICT skills with UDL-based innovations in pedagogy, curriculum, and institutional organization.

Keywords. Universal Design for Learning, Design for All, inclusive education, accessible learning

1. Introduction

Following the European Year for Combating Poverty and Social Inclusion (2010), the adoption of a headline target under the Europe 2020 Strategy [1] on the reduction of early school leaving and the 2010 Council conclusions on the education of migrants and on the social dimension of education and training, social inclusion is promoted through education. For the school sector particularly, the issues of early school leaving and special needs are particularly important. European legislation addresses disability in a broad range of areas: Treaty of Amsterdam on discrimination against disabled citizens; Article 26, EU Charter of Fundamental Rights on 'the right of persons with disabilities to benefit from measures designed to ensure their independence/social and occupational integration/participation in the life of the community.' Mainstreaming accessibility in EU policies is part of the Commission's wider drive to facilitate people with disabilities to play their full part in society. Disability is also at the core of the UN Convention on the Rights of People with Disabilities, to which the European

¹ Corresponding Author.

Community is a signatory. The EU's Europe 2020 strategy has, as a priority, accessibility and economic/social participation of people with disabilities through the elimination of existing barriers. According to the EU Commission Staff Working Document Analysis and mapping of innovative teaching and learning for all through new Technologies and Open Educational Resources in Europe Accompanying document Communication 'Opening Up Education' [2], the wider use of new technology and open educational resources can contribute to alleviating costs for educational institutions and for students, especially among disadvantaged groups. This equity impact requires, however, sustained investment in educational infrastructures and human resources

The right to inclusive and quality education for all has come a long way over the last decades. Since the UNESCO Salamanca Statement of 1994, there is a political will within the 27 EU Member States to carry out the necessary changes in the field of legislation and school organisation. Both on European and national levels, authorities worked on the realisation of legal frameworks facilitating inclusive education for all within the framework of their competence. These declarations and policy documents clearly state that all children and adults have the same right to high quality and appropriate education. While there have been numerous successful efforts to reduce barriers to access, participation, and progress within the general education curriculum, students with disabilities still experience significant difficulty obtaining accessible and usable educational resources in a timely manner. As a result, students with disabilities are chronically at high risk for school failure and under-performance [3, 4].

Over the last twenty years, educators have been searching for ideas and techniques to address access and equity issues that create barriers to effective learning for a variety of students. Educators recognise that every child has unique strengths and needs not served well by a traditional, standardized instructional approach. The challenge, according to Universal Design for Learning (UDL) is not to change the students, but rather to redesign, adapt and personalize curricula and instructional methods and create a learning environment that helps each student develop his or her full potential. Thus, Designing for All (D4All) and promoting inclusion benefits all children and not only those with disabilities. "Universal Design for Learning is a "research-based set of principles that forms a practical framework for using technology to maximize learning opportunities for every student [5]. UDL along with the associated Guidelines is grounded on the D4All principles and constitutes a quite generic framework that has not significantly been introduced in Europe.

In this paper we present the UDLnet project, its aims, the methodological framework, as well as the envisaged themes. UDLnet aims to contribute to the improvement of teachers' practice in all areas of their work, combining ICT skills with UDL-based innovations in pedagogy, curriculum, and institutional organization

2. State of the art

Grounded on new research in neuroscience [6] and the Design for All (D4All) principles [7], Universal Design for Learning (UDL) constitutes an educational approach that promotes access, participation and progress in the general curriculum for all learners [8]. Individuals bring a huge variety of skills, needs, and interests to learning. Neuroscience reveals that these differences are as varied and unique as our

DNA or fingerprints. Three primary brain networks come into play: Recognition Networks, Strategic Networks and Affective Networks [5].

UDL recognises the need to create opportunities for the inclusion of diverse learners through providing curricula and instructional activities that allow for multiple means of representation, expression, and engagement [9].

Three primary principles, based on neuroscience research, guide UDL and provide the underlying framework for the Guidelines:

- Principle I: Provide Multiple Means of Representation (the “what” of learning). Learners differ in the ways that they perceive and comprehend information that is presented to them.
- Principle II: Provide Multiple Means of Action and Expression (the “how” of learning). Learners differ in the ways that they can navigate a learning environment and express what they know.
- Principle III: Provide Multiple Means of Engagement (the “why” of learning). Affect represents a crucial element to learning. Learners differ markedly in the ways in which they can be engaged or motivated to learn.

In fact, two aspects in UDL can be identified: a) a conceptual model from which a set of principles (see above) and practices are derived and b) a set of specific practices and guidelines by which universal design is actually accomplished. In the first decade of its development, the emphasis in the domain of UDL was on the use of technology to inclusive education and accessibility for the disabled. Rose and Meyer [5] proposed that UDL is a research-based set of principles that forms a practical framework for using technology to maximize learning opportunities for every student.

The UDL Guidelines are organized according to the three main principles of UDL (representation, action and expression, and engagement). These are arranged differently depending on the purpose of the representation, but the content is consistent. To provide more detail, the principles are broken down into Guidelines, which each have supporting checkpoints.

2.1. Needs being addressed by the UDL

When educators hear the term UDL, most associate it with technology [10]. However, UDL is not solely about the use of technology in education. It is also about the pedagogy, or instructional practices, used for students with and without disabilities [9]. New developments on the theory and practice of UDL that have emerged underline the importance of instructional pedagogies that facilitate accessibility for diverse learners [11]. Recent research findings have proved that UDL can support access, participation and progress for all learners [9, 12, 13, 14]. However, few have provided a comprehensive framework to put the UDL pieces together, in a practical, research grounded and efficient way [15]. UDL is much more complex than we originally thought [16].

Understanding the potential of UDL is seductively easy. Its exponential growth indicates that it may be the right idea at the right time. However, it has proven far easier to help the various stakeholders understand the potential of UDL than it has been to implement UDL on a large scale. Now that more people are “doing UDL,” it is not clear what the outcomes are. Udvari-Solner et al. [17] illustrate ways to apply UDL principles to provide all students with multiple means of representation, multiple means of engagement, and multiple means of expression. To initiate a universal design approach, they advise secondary educators to think about three distinct curriculum

access points: content, process, and product. UDL requires collaborative planning amongst teachers with different curriculum knowledge and skills [18]. Complaints that are often raised include lack of time to co-plan and lack of resources to teach a differentiated curriculum. With the term Web 2.0 we describe a broad spectrum of digital tools to create, edit, share, discuss, engage, collaborate, and communicate in online media sharing spaces [19]. These tools are used to edit, mix, remix, record, and publish content. Web 2.0 tools are interactive and multisensory. These technologies, therefore, are ideal for teachers wishing to apply UDL, i.e. craft flexible, scalable, differentiated activities that are accessible and engaging for reluctant and eager learners alike [20]. The Open Discovery Space portal [21] is a repository, harvester, a place to search and build resources, lesson plans and learning scenarios collaboratively among teachers' networks with the use of the ODS Authoring tool. CAST UDL Exchange [22] is a Web 2.0 base place to browse and build resources, lessons and collections. These materials can be used and shared to support instruction guided by the UDL principles. UDL Exchange facilitates the power of networking to create, remix, and share UDL-informed lessons and activities. According to Edyburn [16] "as we head into the second decade of doing UDL, it is time for a new generation of thinking about UDL. We need to clarify the core stakeholders (developers or teachers) who will be trained to create UDL products. We need to understand what it means to implement UDL. We need to understand how to measure the outcomes of UDL. Finally, we need to renew our commitment to equitably serving all students in the event that our UDL efforts fall short".

While UDL emerged in the context of disability, disability (and the associated services provided for people with disabilities) has come to be viewed in the context of a wider rights and equality agenda. This agenda addresses the whole range of exclusionary and discriminatory practices that marginalize other kinds of groups. Disability has much to learn from locating itself in this wider context of social exclusion. This applies both to the understanding of social injustice and differential access in Europe and to the creation of innovative methods to combat discrimination.

3. The UDLnet network

In order to bridge the gap between policies and practice in applying UDL and to face the associated obstacles identified above, we present here the design and development of the UDL Network –UDLnet [23]. UDLnet aspires to address the necessity of collecting and creating good practices under the framework of UDL from a wide range (generic guidelines down to more specific ones) of four envisaged themes: inclusive learning environments, accessible resources, teachers' and school leaders' competences, examination of barriers and identification of opportunities. Moreover, it investigates current needs related to the use of mobile devices in UDL practice. Furthermore, accessibility options emended in the mobile devices under the D4All approach is explored along with the application of the UDL framework in real inclusive educational practices. UDLnet targets 3,500 users in seven countries across Europe (Greece, Ireland, Cyprus, Finland, Netherlands, Germany, Spain) and in six languages.

In general, UDLnet aims to improve teachers' practice in all areas of their work, combining ICT skills with UDL-based innovations in pedagogy, curriculum, and institutional organization. It is also aimed at in-service and pre-service teachers' use of ICT skills and resources to improve their teaching, to collaborate with colleagues, and

perhaps ultimately to become innovation leaders in their institutions. In addition, it aims to train school leaders and other school staff about the ways they can adapt, personalize and select some of the existing, easy-to-use, and free-of-cost software tools that various organizations around Europe offer. The purpose of this is to set up tailor-made learning tools and lesson designs (at their institutional or regional level) and to interconnect these with existing infrastructures. The overall objective is not only to improve classroom practice, but also to raise awareness of the European educational community on the need for UDL based teaching and learning practices. The innovation of UDLnet lies within the connection of good practices from various European countries on school/university education and training, open to wide teacher and student communities who will then effectively provide UDL in education.

3.1. UDLnet Methodology

The envisaged procedure of UDLnet Network consists of the following basic phases:

- Good Practice Thematic Search and Organization: good practices shall be collected from partner countries, as well as from affiliated institutions in the areas of inclusive education all over Europe with emphasis in UDL, through focus groups, as well as through the practice exchange forum. A set of guidelines and criteria will be set and followed in order to ensure the quality of these practices.
- Implementation: a number of events shall be organised for the exchange, validation and evaluation of the collected UDL good practices: such as training sessions, contests, summer schools, webinars, as well as workshops organized in local and European level. The specially developed web-based inventory that will allow all interested parties to access ideas and good practices on effective use of accessible eLearning resources will contribute to this. All these actions aim to create a European network of teachers discussing, testing, implementing and eventually even developing inclusive practices.
- Valorisation: The formation of a set of recommendations to policy makers and regional authorities shall indicate ways European policy makers can use the UDLnet Inventory and UDL good practices to support the inclusive education and training of their citizens. Moreover, a concrete guide of good practices for teachers (Pathway to Universal Design for Learning) will be disseminated through teacher communities across Europe.

3.2. Themes addressed by UDLnet

Methodologically, UDLnet addresses the following four main themes

- a) UDL-based learning environments,
- b) UDL resources,
- c) Teachers' and school leaders' competences,
- d) Examination of barriers and identification of opportunities.

3.3. UDLnet evaluation methodology framework

An evaluation methodological approach will be set in order to assess the impact of the major intervention designed and implemented in the context of UDLnet on the

participating school communities and in order to identify barriers to adoption. Evaluation will have both a formative and summative nature. The formative evaluation component will be related to the monitoring activities of the project. Summative evaluation will focus on assessing the impact of the project activities. UDLnet is going to achieve the objectives addressed by the following coordinated actions:

- By contributing to the openness and inclusiveness of education in Europe;
- By letting teachers and students acquire Competences;
- By stimulating the demand for accessible eLearning resources, designed based on the UDL approach.

In order to measure the impact of using learning resources in aspects that need to be addressed, UDLnet will measure impact on the three axes: on students - teachers; on school level (mainstream and special); on educational systems.

The UDLnet approach includes the following steps:

- Development of a detailed and systematic methodology to define the criteria for identifying good UDL practices and then operate as the frame for collection and formation of exceptional UDL based teaching and learning approaches
- Design and development of the Web 2.0-based UDLnet Inventory (<http://udlnet.di.uoa.gr/>), with a collection and categorization of UDL good practices that can support a learning community where users will be able to find, exchange and adapt inclusive teaching and learning practices and exchange ideas and good practices (Fig. 1).
- Establishment of a constantly-expanding network of educational communities informed on the necessity of UDL based innovative teaching and learning practices and trained accordingly [24]. This network will operate in an independent way, with teachers supplying the educational material and ultimately being responsible for the preservation and further enhancement of the inventory and through Web 2.0-based approaches and tools (Fig.1).
- Collection and development of innovative, relevant and multilingual content that will support the UDL approach, which is described and stored in the UDLnet Inventory. So far 32 good practices, 88 media resources and 4 collections are available to the members of the UDLnet community.
- Development of teachers, school leaders, school staff skills and attitudes to ensure the access to and use of UDL based teaching and learning practices under the umbrella of community building. Community building is critical component that enables their success in learning programs by reducing isolation, mentoring success, transforming experiences of exclusion to ones of inclusion, offering encouragement and hope, and fostering group dialogue and peer learning. To this end, a Teacher Training Academy on the theme of UDL is available through the ODS portal [24].

4. Conclusion and further work

It has proven far easier to help the various stakeholders understand the potential of UDL than it has been to implement UDL on a large scale. UDL requires collaborative planning amongst teachers with different curriculum knowledge and skills. We have presented the methodological approach of the UDLnet project along with the current

development and achievements of the UDLnet Inventory and the UDLnet Community portal. UDLnet is in the process of collecting good practices of universal design for learning with focus groups where stakeholders and experts might attend and contribute and we hope that the recommended approach will contribute towards creating and sharing inclusive open educational resources.

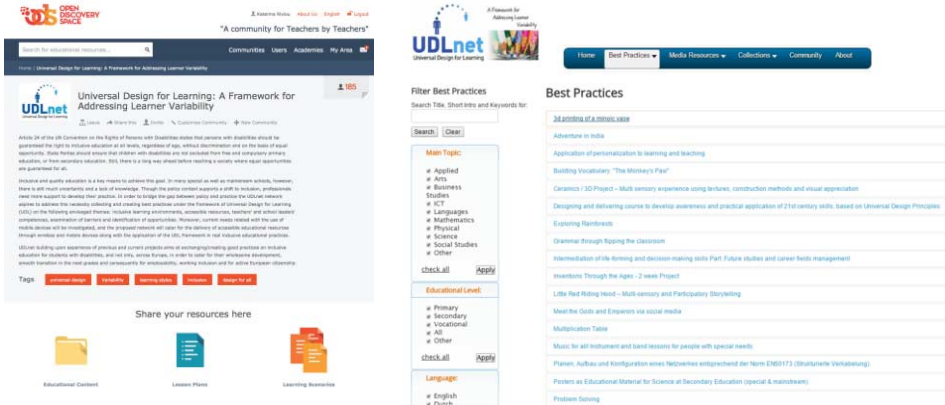


Figure 1. UDLnet Community (left) and UDLnet Inventory (right) first pages.

Acknowledgement

This research has been undertaken under the project UDLnet: Universal Design for Learning: A Framework for Addressing Learner Variability (540659-LLP-1-2013-1-GR-COMENIUS-CNW) [www.udlnet-project.eu] funded with support from the European Commission. This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

References

- [1] Communication from the Commission: Europe 2020 - A Strategy for Smart, Sustainable and Inclusive Growth. COM(2010) 2020; <http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%202007%20-%20Europe%202020%20-%20EN%20version.pdf>
- [2] Commission Staff Working Document Analysis and mapping of innovative teaching and learning for all through new Technologies and Open Educational Resources in Europe Accompanying the document Communication 'Opening Up Education' {COM(2013) 654 final} <http://ec.europa.eu/digital-agenda/en/news/commission-launches-opening-education>
- [3] J. Blackorby and M. Wagner, *Overview of findings from wave 1 of the Special Education Elementary Longitudinal Study (SEELS)*, Menlo Park, CA: SRI, 2004 http://www.seels.net/designdocs/seels_wave1_9-23-04.pdf
- [4] L. Frieden, *Improving educational outcomes for students with disabilities*, Washington, DC: National Council on Disability, 2004. <http://www.ncd.gov/newsroom/publications/2004/educationoutcomes.htm#execsummary>
- [5] D.H. Rose and A. Meyer, *Teaching every student in the digital age: Universal design for learning*, Alexandria, VA: Association for Supervision and Curriculum Development, 2002.
- [6] T. Hall, A. Meyer and D. Rose, *Universal Design for Learning in the Classroom*, The Guilford Press: New York, 2012. ISBN 978-1-4625-0631-6.

- [7] C. Stephanidis, *Designing for all in the Information Society: Challenges towards universal access in the information age*, 1999 http://www.ics.forth.gr/files/ICST_Report.pdf
- [8] CAST, 20014, <http://www.cast.org/udl/>
- [9] M. King-Sears, Universal design for learning: Technology and pedagogy, *Learning Disabilities Quarterly*, **32** (2009), 199-201.
- [10] V. Zascavage and K. Winterman, What middle school educators should know about assistive technology and universal design for learning, *Middle School Journal*, (2009), 46-52.
- [11] S. Burgstahler, *Universal Design in education: Process, principles and applications*, 2012, <http://www.washington.edu/doiit/Brochures/PDF/ud.pdf>
- [12] T.C. Jimenez, V.L. Graf and E. Rose, Gaining access to general education: The promise of universal design for learning, *Issues in Teacher Education*, **16**, (2007), 41-54.
- [13] K. J. Kortering, T.W. McLannon and P.M. Braziel, Universal design for learning: A look at what algebra and biology students with and without high incidence conditions are saying, *Remedial and Special Education*, **29**, (2008), 352-363.
- [14] G. Meo, Curriculum planning for all learners: Applying Universal design for Learning (UDL) to a high school reading comprehension program, *Preventing School Failure: Alternative Education for Children and Youth*, **52**, (2012), 21-30.
- [15] J. Katz, The Three Block Model of Universal Design for Learning (UDL): Engaging students in inclusive education, *Canadian Journal of Education*, **36**, (2013), 153-194.
- [16] D. Edyburn, Would you recognize universal design for learning if you saw it? Ten propositions for new directions for the second decade of UDL, *Learning Disability Quarterly*, **33**, (2010), 33-41.
- [17] A. Udvari-Solner, J.S. Thousand, R.A. Villa, A. Quiocho, A. and M. Kelly, *Promising practices that foster inclusion*. In R.A. Villa & J.S. Thousand, *Creating an inclusive school*, 2nd ed., Alexandria, VA: Association for Supervision and Curriculum Development, 2005.
- [18] A. Nevin, C.A. Falkenberg, S. Nullman, L. Salazar, and M.C. Sillio, Universal Design for Learning and Differentiated Instruction: Resolving Competing Mandates of the Individuals with Disabilities Education Act and No Child Left Behind” Proceedings COERC: Third Annual College of Education Research Conference: pp.92-97, 2004.
- [19] G. Solomon and L. Schrum, *Web 2.0: New tools, new schools*, International Society for Technology in Education, 2007.
- [20] K.V. Kingsley and J. Brinkerhoff, J. (2011): Web 2.0 tools for authentic instruction, learning, and assessment, *Social Studies and the Young Learner*, **23** (2011), 9-12.
- [21] Open Discovery Space (ODS) portal (2013), <http://portal.opendiscoveryospace.eu/>
- [22] CAST UDL Exchange, <http://udlexchange.cast.org/home>
- [23] UDLnet, <http://www.udlnet-project.eu/>
- [24] UDLnet Community Portal, <http://portal.opendiscoveryospace.eu/community/udlnet-universal-design-learning-framework-addressing-learner-variability-669613>