

## **A quantitative research on teachers' attitudes towards Universal Design for Learning during COVID-19**

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### **Abstract**

As Universal Design for Learning (UDL) appears in the relevant literature as a pedagogical approach which responds to inclusive and equitable education, our research is an attempt to investigate teachers' attitudes of Greek secondary education towards UDL through a quantitative research method this of the questionnaire. More specific, 225 participants took part in our survey which was held from 01/03/21 to 30/06/21. Through our research we have highlighted key points regarding teachers' attitude towards UDL, such as the obstacles to its implementation as well as the effects of it. Due to the current conditions i.e. the implementation of online learning as an emergency measure due to COVID-19 a main question to answer was whether UDL is considered feasible even in online learning.

**Keywords:** online learning, teachers' attitudes, Universal Design for Learning

### **Introduction**

The educational reality in Greece, as in other countries too, is consisted of a significant heterogeneity regarding the student population. Students of all educational levels are characterized of different features and needs. Global geopolitical and financial conditions as well as the emergence of the pandemic COVID-19 affected deeply the social composition creating specific needs and requiring relevant management methods. As far as education is concerned, the effects of the above conditions are obvious and consisted of students' differentiation in demographic, socio-economic, cultural and ability level. School as the mirror of the wider society reflects new needs and requirements and is called upon to respond to modern circumstances.

As student population is highly differentiated according gender, culture, language and ethnicity, abilities, socio-economic background, students' needs are accordingly differentiated. Respectively teachers seek for pedagogical methods that correspond to students' needs. In this context Universal Design for Learning (UDL) appears in literature (Meyer et al., 2014) as an efficient philosophy that promises free, accessible and equal education for all. UDL is the educational framework that responds to the modern requirement for students' inclusion, regardless of differentiating characteristics, aiming to equal access to learning without any exclusion (Pace & Schwartz, 2008; Rose & Meyer, 2002).

Especially during the school years 2019-2020 and 2020-2021, when the presence of COVID-19 was dominant, teachers and students had to deal with new challenges with prominent this of online learning and the difficulties which entails as schools of any level were closed for long periods. Issues such as equal access and equal opportunities for all were raised (Markou & Noguera, 2020) since online learning was an emergency measure and it was not the required time to be organized on the basis of inclusive education (Mavrou, 2020). Also the learning environments (educational platforms) were not accessible to all (McCall, 2020). In addition, 10% of the student population belonged to the category of children with special needs/disability and it was the need for facilities that were not planned in the context of such an emergency implementation (Armitage & Nellums, 2020; Petretto et al., 2020).

Consequently, the education system needs radical reforms and the UDL framework supports the most viable foundation for beginning this redesign process (Basham et al., 2020).

#### **UDL context**

UDL is a philosophy that started in the field of architecture and was extended to the field of education, which advocates that all contexts are designed in such a way as to empower students regardless of differentiating characteristics to participate in the learning process as much as possible (Izzo & Baker, 2015), eliminating any obstacles regarding infrastructure, educational material, curriculum or teaching methods (Arabatzis et al. 2011).

The element that differentiates UDL from other educational approaches is that recognizes and accepts diversity a priori, so that no retrospective adjustments or modifications are required. UDL does not claim that there is a universal solution that works for everyone. Instead, it is based on the design of learning that addresses the different needs of all students through the integration of alternative and flexible proposals and practices. It can be applied in every learning process, in every educational level and subject without exception, in special education, intercultural education, adult education, both in live and distance education.

It is an organized framework of educational practices which is based on three main pillars according to CAST (2011):

- Multiple ways of representing information
- Multiple means of action and expression
- Multiple means of engagement

UDL is based on neuroscience findings on how the human brain works and is related to the learning process (Meyer et al., 2014). It therefore focuses on the networks of the brain that are connected to the learning process, namely the emotional networks, the recognition networks and the strategy networks, to which the three pillars of the UDL correspond to.

UDL as an educational approach provides the right framework to meet the different needs of all students, not just those with special educational needs (King-Sears, 2009) based primarily on the need for respectively flexible learning environments and secondly on the different learning styles. Online education with a variety of digital tools auxiliary for students ensures the required flexibility and is a fertile ground for the implementation of UDL (Dawson et al., 2019; Ok & Rao, 2019). In particular, nowadays due to COVID-19 pandemic, the application of effective pedagogical practices in online education becomes imperative (Rao & Meo, 2016). UDL can benefit students not only in a traditional classroom but also can provide high challenges to maximize online teaching and learning (Coombs, 2010; He, 2014; Lancaster, 2008).

#### **UDL in Greece**

For the Greek government, inclusion in education is a matter of policy and a key pillar and strategic goal (Eurydice, 2020). Accordingly, the relevant Greek ministry, this of education, proceeded to a series of laws aiming to ensure inclusion (Eurydice, 2020) favoring UDL in the Law for special education (Law 4415/2016). However, as far as the Greek educational system is concerned we cannot claim that UDL holds the appropriate position in pedagogical issues despite the fact that it is acknowledged as an effective, inclusive practice in the international literature (Al-Azawei et al., 2016; Dymond et al., 2006; Lieberman et al., 2008; Rose & Meyer, 2002; Sailor & McCart, 2014; Shogren & Wehmeyer, 2014; Thoma et al., 2009). The relevant Greek studies and the recorded UDL implementations as well are incredibly limited (Akogiounoglou et al., 2019; Chalkiadaki & Akogiounoglou, 2019; Riviou et al., 2014; Tzivinikou, 2014).

At this point, it is worth mentioning two projects concerning UDL in Greece. We refer to UDLnet (<http://www.udlnet-project.eu>), funded by the European Union, aiming to develop a systematic methodology and good practice criteria around UDL (Giannelos & Mathioudaki, 2017). Furthermore, the project “Universal Design and Development of Accessible Digital

Education Material” (<http://www.prosvasimo.gr>), funded by the European Union and national financial resources as well, provided for the development of universally designed printed and digital educational material for students with special educational needs/disabilities (Gelastopoulou & Kourbetis, 2017).

### **UDL and online learning**

There is confusion as regards definitions and distinction of the terms e-learning, distance learning, online learning and other related but it is something that does not concern the present work. However, we will refer briefly to the above terms. When we talk about distance education we are referring to courses that are studied without being necessary for teachers and students to be physically present at school or college or other educational institute (Guilar & Loring, 2008; Volery & Lord, 2000), while existing distance is overcome by using technological resources (Casarotti et al., 2002). So, we can perceive it as “a process to create and provide access to learning when the source of information and learners are separated by time and distance, or both” (Honeyman & Miller, 1993). Online learning, e-learning and similar terms refer to 100% online courses taking place over the internet (Oblinger & Oblinger, 2005). It is a type of distance learning, so we understand that distance learning functions as an umbrella for any learning process that takes place across distance and not in the context of a physically classroom (Stern, n.d.). Therefore, we can claim that distance learning is simply a wider term that includes among other and e-learning.

During the COVID-19 pandemic, a rapid online teaching and learning transition become a common reality for many countries including Greece (Bartlett, 2020; UNESCO, 2021). The COVID-19 pandemic has affected and resulted in schools and educational institutes’ closure as well as in online learning rise, recognizing it as the only feasible measure for the continuum of education. As a result, education reality has changed dramatically as well as the whole reality. The consequences of corona virus might stay as it is unlikely to return to the past way of life, before COVID-19 (Daniel, 2020). The adoption of online learning will continue to persist post-pandemic but it should be adjusted to educational and pedagogical terms in order to be an effective and quality way of education. It should follow the relevant policy, this of inclusion, that is not only a social imperative but also a political issue for Greece (EURYDICE, 2021). We seek for inclusive classes where equity and fair are the dominant axioms.

In this context UDL comes to the fore as an educational framework that embraces inclusion maximizing learning and minimizing barriers for all students (Bernacchio & Mullen, 2007; Rose & Mayer, 2008). UDL creates fair and equity providing multiple equal opportunities for all students according their needs (Black et al., 2014). In fact, UDL, according the relevant literature (Coombs, 2010; He, 2014; Lancaster, 2008), responds to the challenges of distance learning and can be implemented effectively not only to face-to-face environments but as well in entirely digital environments of education. Of course, UDL cannot address all the obstacles of online learning but can motivate learners to achieve the learning goals in a more effective or enjoyable way (Al-Azawei et al., 2016).

The potential and effectiveness of designing accessible curricula by using online learning has been discussed in literature concluding that e-learning ought to be blended with pedagogical contexts in order to ensure access for all students and meet their needs (Bongey et al., 2010; Seale & Cooper, 2010). As far as UDL is concerned, many researchers identify the effect of using educational technologies on designing and implementing UDL courses (Bühler & Fisseler, 2007; CAST, 2011; He, 2014; Kumar & Wideman, 2014; Rose & Strangman, 2007; Smith & Harrrey, 2014). Technology based environments and digital tools provide effective means to put UDL into action (Meyer & Rose, 2005; Ok & Rao, 2019). And vice versa, UDL based blended e-courses can lead to positive effects for the learning procedure and the students as well (Dallas et al., 2016; Morra & Reynolds, 2010).

## **Methodology**

The current research aims both to analyze attitudes that teachers of Greek secondary schools have towards UDL as well as to identify the variables that affect these attitudes. The research method is quantitative; a questionnaire is used as a research tool.

### *Necessity and usefulness of the educational research*

This educational research contributes significantly to the development of the relevant educational scientific fields, as the use of its findings can lead to further development by the responsible educational organizations and the teachers themselves (Altricher et al., 2001). In fact and given the very limited research activity in this area the usefulness of the current research is even greater.

### *Research questions*

The research is guided by the following research question: What is teachers' attitude towards UDL in Greek secondary education? Subsequently the following sub-questions emerge:

- Do teachers know the most current educational terms, these of UDL, intercultural and inclusive education?
- To what extent do teachers consider UDL as a necessity nowadays?
- Do they implement UDL in their instruction?
- What are the obstacles for UDL implementation?
- To what extent are they personally satisfied from its implementation?
- Under the special conditions of the research, i.e. the complete provision of distance learning due to the pandemic Covid-19, do they consider UDL implementation feasible in a digital environment as well?

### *Research design and data analysis*

For our research we used as a quantitative tool the questionnaire choosing simple random sampling. It is about a web-based surveying on the advanced online *survey* system of lime survey (<https://www.limesurvey.org/>). After the questionnaire's initial design and before its distribution, issues of validity and reliability were examined. More specific we tried to access the validity of our questionnaire through face validity in order to detect errors and proceed to modifications in a quick way. Then the questionnaire was distributed to a convenience sample (25 respondents) in order to confirm whether

- The terms used are easy to understand
- The order of the questions does not cause tendencies of possible confusion
- The wording of the questions allows the collection of the desired data
- The estimated time to complete the questionnaire
- The reliability of the questionnaire.

The first sector of the questionnaire included seven questions of demographic interest, while the second one titled "*The views of secondary school teachers on UDL and its contribution to the promotion of intercultural and inclusive education*" included twenty-five questions. The questionnaire consisted of questions that were closed, of single or multiple choices, with predefined answers leading to data collection.

In order to encode the data and analyze / interpret the results we used the statistical package of SPSS (Statistical Package for Social Sciences). We also used descriptive statistics to present the data of the statistic research and conduct relevant conclusions. The presentation of the quantitative data was performed through graphs.

*Sample and data collection*

To select the sample, we addressed to secondary schools and Second Chance Schools having received the relevant permits from the competent bodies, i.e., IEP (Educational Policy Institute) and INEDIVIM (Foundation for Youth and Lifelong Learning). To be more specific, a total of 101 secondary schools and 19 SCSs, from the regional units of Attica, Peloponnese, Central Macedonia and Central Greece, participated in the survey. The sample was made up of a total of 225 teachers of secondary education that work either in lower secondary education (gymnasium), either in upper secondary education (lyceum) or in SCSs, adult schools that provide a diploma equivalent to this of secondary education. Of these, 149 teachers serve in general secondary education, 38 in special education as parallel support or in integration departments, and other 38 in SCSs. The most of them are women while the majority of the whole participants are 20 to 45 years old. In addition, in a very satisfactory rate and more specific 57, 8% have a master’s degree.

**Table 1. Demographic Summary of Study Participants**

Sample data			
Total Sample		n=225	100%
		n	%
Gender	Women	162	72%
	Men	63	28%
Age	20-45	131	59,2%
	Over 45	94	41,8%
Teacher of	General education	149	66,2%
	Special education	38	16,9%
	SCSs	38	16,9%
Educational level	Diploma	78	34,7%
	Master’s degree	130	57,8%
	Doctoral	17	7,6%

*Implications and limitations*

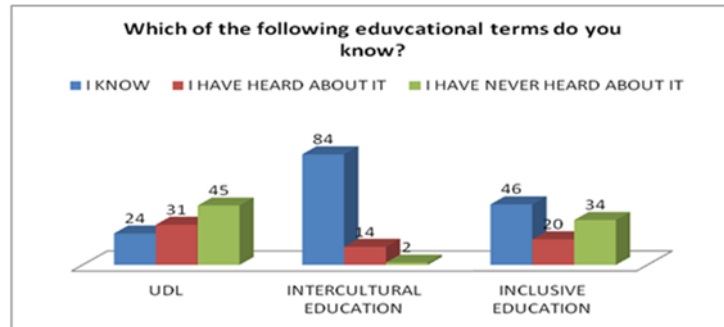
Our survey was completed according to the original schedule without any problems. The candidates were informed about the research (information protocol) as well as about issues of anonymity and security of personal data (Cohen et al, 2008). The protocol and the questionnaire link were sent via email as an attached file accompanied by a brief information material related to the UDL philosophy. We considered necessary to send this material in order to have answers to basic questions, e.g., necessity of UDL even by respondents who did not know the term.

The participants answered the questionnaires from 01/03/21 to 30/06/21 without any problems. However, the small sample size does not allow for generalizations to the wider population of teachers which is much larger. So, we avoided generalization for reliability reasons.

**Findings**

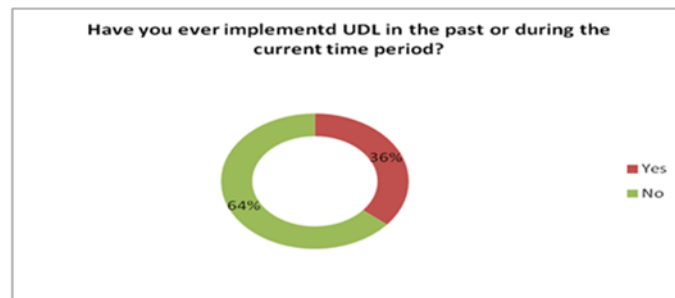
*Teachers’ attitudes towards UDL*

The research data demonstrate teachers’ attitudes towards UDL which is the main issue of our research. On the one hand, we find out that there is a difficulty in adoption and implementation of new educational philosophies by teachers. It is worth noting that most of them (98%) know or have heard about intercultural education, while to a lesser extent (66%) inclusive education and UDL (55%). The percentage of 55% corresponds to 123 participants from the total number of 225.



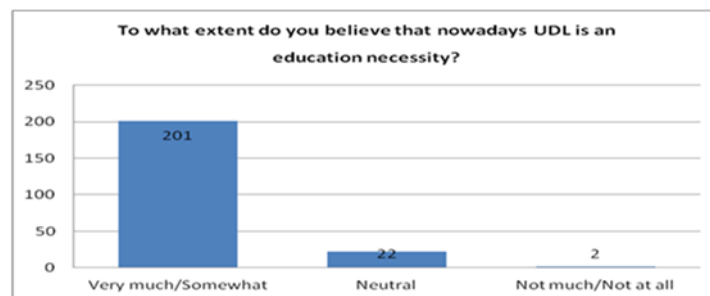
**Figure 1. Teachers’ knowledge for UDL, intercultural and inclusive education**

The 123 participants were asked whether they have ever implemented UDL in the past or during the current time period, this of school closure due to COVID-19 (school year of 2020-2021). The 36% of them (44 participants) answered positively while the other 64% (79 participants) responded negatively.



**Figure 2. Teachers’ percentage of implementing UDL**

On the other hand, despite the fact that only the 55% of the sample knows/has heard about UDL, an overwhelming number, 201 out of 225 teachers, believes that UDL is an educational necessity against 22 teachers who answer neutrally and 2 who do not consider it necessary. Their opinion is based on the information material that was at their disposal from the first moment and they were asked to study it before completing the questionnaire.

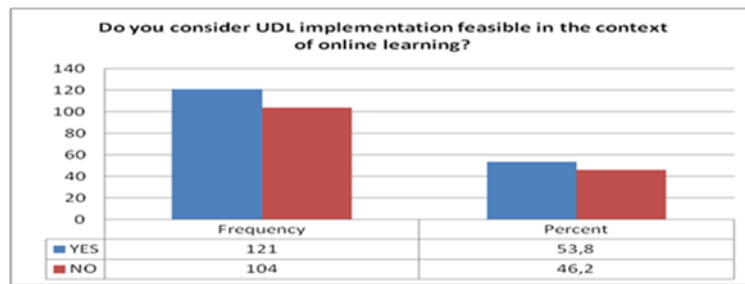


**Figure 3. UDL as an education necessity**

Despite that fact that not all the participants know UDL and consequently are not able to implement it even in a physical class, they all asked to answer the question “Do you consider UDL implementation feasible in the context of online learning?” with the rationale that it is an educational philosophy and as they are aware of digital learning environments due to current



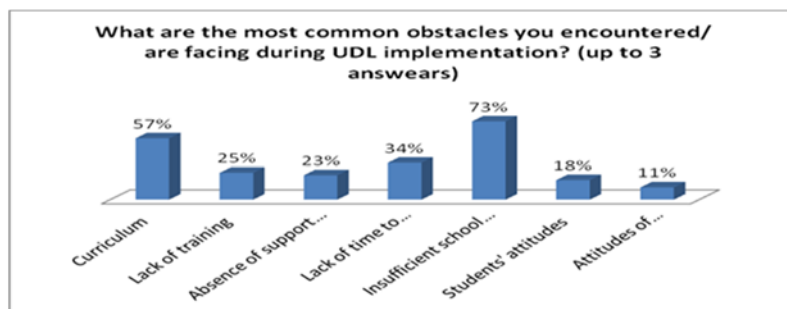
circumstances they can form a relevant opinion from their experience. From the total number of 225 participants, 121 responded positively while the other 104 negatively.



**Figure 4. UDL in online learning**

*Obstacles in UDL implementation*

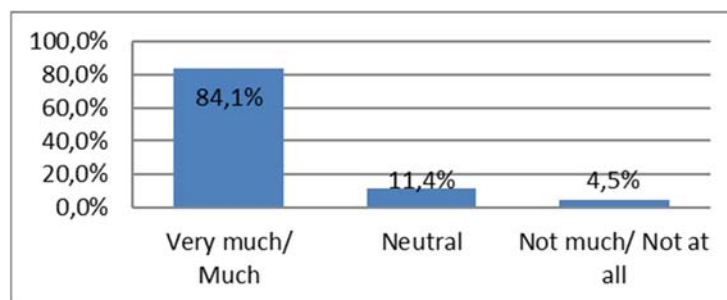
According to teachers' answers on the question "What are the most common obstacles you encountered/ face during UDL implementation?" the majority of them claims that the insufficient school infrastructure (facilities, technological equipment) and the current Curricula are the main difficulties they face. "Lack of time to prepare", "Lack of training", "Absence of support (from PEKES / PRINCIPAL OF SCHOOL UNIT / COLLEAGUES)", follow as answers in the above question. A smaller percentage refers to students' attitudes or their guardians' attitudes as a difficulty in implementing UDL.



**Figure 5. Obstacles in implementing UDL**

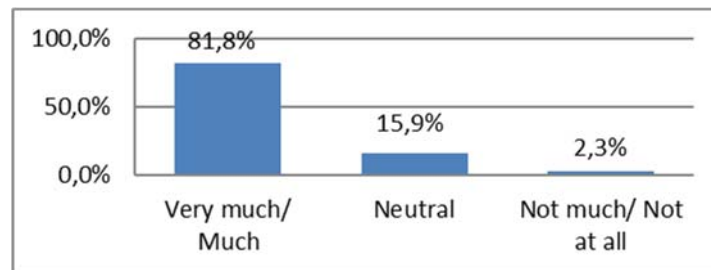
*UDL impact on teachers and students*

The 44 teachers, who have implemented UDL, answered the question whether the application of UDL provides them with personal satisfaction and a sense of self-esteem. In percentages, the 84,1% claimed that yes, UDL implementation gives them satisfaction and a high sense of self-worth.



**Figure 6. Teachers' personal satisfaction by implementing UDL**

Likewise, as regards UDL effect on the students, positive data were drawn from the teachers' responses to the relevant question "Does the implementation of UDL contribute to the motivation/participation of all students and improve their performance?". The majority (81, 8%) claimed that UDL implementation contributes to students' motivation and participation as well as to the improvement of their performance.



**Figure 7. Students' motivation/participation and performance**

### Discussion

Studying the data of our research we interpret them as follows. The teachers of our sample are more acquainted to practices such as intercultural and inclusive education while are not too keen on new philosophies like UDL. Certainly this attitude is attributed to the fact that UDL is not promoted as much as the other terms and it also requires some perquisites, compatible curricula and relevant training. The teachers of our sample refer to several factors that function as obstacles to UDL adoption and implementation, which are also recorded in the international literature. To be more specific, the lack of infrastructure, the incompatible to UDL curricula, the extra required planning time as well as the lack of relevant training are recognized as main barriers to UDL adoption and implementation (Cooper et al., 2008; Kumar and Wideman, 2014; Markou & Diaz-Noguera, 2022; Mavrou, 2012; Rose et al., 2006; Riviou et al., 2014; Tzivinikou, 2014;).

It is worth mentioning that teachers are amenable to UDL as a significant percentage, who have implemented UDL, claim that have a high sense of personal satisfaction and recognizes positive effects to student's performance as well. Therefore, even teachers that they are not acquainted to UDL accept that UDL is a necessity for educational systems like the Greek one. Probably teachers, evaluating the educational situation and mainly students' diversity, look for new teaching methods that meet the contemporary educational requirements. However, the adoption of new pedagogical approaches also requires a corresponding cognitive background, compatible curricula and infrastructures. So, reforms are required, radical reforms consistent with UDL framework for a well-organized and systematic adoption in the Greek educational system. Until now, the necessary decisions and actions have not been made by the relevant Ministry for both the systematic training of teachers and curricula adaptation in this direction (Markou & Diaz-Noguera, 2022).

Encoding our research data and interpreting the findings we reach the conclusion that there is an oxymoron as despite the fact that almost half of the teachers know/have heard UDL and even a smaller percentage implements UDL in Greek secondary education, in their overwhelming majority they believe that UDL is nowadays an education necessity. As it was mentioned our sample relied on information related to UDL that was received before filling in the questionnaire.

The low percentage of teachers who know and therefore implement UDL as extracted from the survey data is due to insufficient training and the other mentioned obstacles, i.e. the existing curricula, the lack in school infrastructure and the lack of a well-coordinated effort by the Ministry of Education in this direction.



The fact that the majority of teachers, who have implemented or implement UDL, feel satisfied, it also indicates the positive impact of UDL to teachers themselves. As regards UDL in online learning, teachers are divided. A bit more than the half has a positive attitude while the corresponding percentage answers negatively. So, the very close percentages require further investigation.

### **Conclusions**

UDL is an educational framework that addresses the current demand for inclusion. Due to its characteristics, those of variety and flexibility can be an effective learning approach. Even in special conditions like digital educational environments or blended courses (face to face and online learning) UDL can be implemented providing equal access to learning for all despite any differentiating characteristics.

Our research comes to confirm the positive impact of UDL both for teachers and students. Furthermore, according to our sample answers we come to the conclusion that UDL is feasible in online learning. However, in Greece, based on our research findings, we conclude that UDL implementation is in an embryonic stage as only a low percentage of secondary teachers, who participated in our research, really knows and respectively implements UDL. Of course, due to the small sample we cannot proceed to arbitrary generalizations. On the contrary our conclusions concern only our sample and we consider necessary a further research on the subject.

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