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**UNIVERSAL DESIGN IN TEACHING AND LEARNING:  
APPROACHES, DEFINITION AND USE**

*The article outlines the key elements of universal design in teaching and learning that include appropriate use, flexibility in use, effective teaching, multiple means of presenting curriculum content, and ways of perceiving the content irrespective of sensory and motor abilities. The use of universal design in inclusive education helps to ensure individualized approach that respects diversity and facilitates progress and achievement for every learner.*

**Key words:** *universal design, inclusive teaching and learning, accessibility, education, educational environment*

The concept of universal design (UD) has been defined as an essential principle in the UN Convention on the Rights of Persons with Disabilities. The principles of universal design were elaborated in 1997 by a group of architects, product designers, engineers

and environmental design researchers chaired by Ronald Mace from the Center for Universal Design at the North Carolina State University. Following the studies conducted by the Centre, universal design involves altering products, connections and surrounding buildings to ensure that they may be used by as many people as possible and such alterations will not cost much, if anything at all. Universal design creates benefits for people of all ages and abilities. Later the UD principles were extended to the field of education to include physical as well as cognitive and social accessibility of curricula and learning environment.

The meaning of UD principles and their practical implications in relation to teaching and learning are described below.

1. *Equitable use: equitable curriculum*

Ensuring equitable and accessible environment by providing the same means to all users to avoid segregating specific groups. The design should be easy to understand and use by people with diverse abilities.

The instruction is based on the single curriculum which is accessible for learners with different abilities, does not segregate them or overemphasize their 'differences'. The curriculum is developed so as to engage all students.

2. *Flexibility in use: flexible curriculum*

The design should provide for a broad range of individual accommodations and suit a variety of needs, preferences and abilities of users.

The curriculum design provides opportunities to deliver it in a flexible way and adapt to a wide spectrum of individual abilities. Furthermore, it respects disorders in mental, sensory and motor development, different learning styles, etc.

3. *Simple and intuitive use: simple and intuitive teaching*

The design should provide for easy and intuitive use of a product of service. Any person regardless of their experience, education, language skills, or present concentration level should be able to understand the use of the product of service.

Teachers' instructions need to be clear and provided in different ways taking into account students' individual differences. The language and complexity of presenting curriculum content should be adapted to their individual abilities. Student progress is measured on an on-going basis, and learning goals and teaching methods are adjusted as required.

4. *Perceptible information irrespective of user's sensory abilities: multiple means of presenting curriculum content*

The design should communicate the information effectively to user regardless of their ability to understand it or ambient conditions.

The curriculum provides for different means of presentation to help convey information in the most effective way independently of the learner's sensory abilities, levels of understanding, or focus.

5. *Tolerance for mistakes: success-oriented curriculum*

The design should minimize hazard to life, possible risks, and adverse consequences of any accidental or unintended actions by users.

The teacher encourages all students to engage with the curriculum by reducing unnecessary barriers and creating a supportive learning environment.

6. *Low physical effort: appropriate level of student effort*

The design should foster efficient and comfortable use of a product or service with minimum fatigue. It should require little physical effort on the part of the user.

The overall learning environment provides for easy access to curriculum materials, ensures easy use and fosters student motivation and engagement. The new content is presented based on the results of on-going assessment.

7. *Size and space for approach and use: appropriate environment for learning*

The design should consider the required size and space for approach, reach and various manipulations taking into account user's body size, condition and mobility.

The learning environment and the way curriculum materials are organized allow for different types of cognitive and physical access by students; the classroom setting enables students to work in small groups and encourages learning.

When applying the concept of universal design to teaching and learning, it should be borne in mind that universal design in education context means providing information in a range of formats to suit different ways that individual students perceive and express information.

This in turn will make the curriculum more accessible for all students, including those with disabilities and special needs, in the course of their learning. For instance, for a student who is visually-impaired or blind and has difficulty downloading reading materials from a website, the materials should be printed in large font size or in Braille, so that he or she will not encounter significant inconveniences. For teachers such adaptations may be very time-consuming. The concept of universal design in relation to learning assumes that such materials are available and accessible, which would not require any additional adaptations or modifications by the teacher.

When a student with learning problems had difficulty reading texts in class, this would render the curriculum less accessible for them. One of the solutions is to record the information or ask the parents, other students or volunteers to read it aloud. According to the UD concept, in addition to the text being available in digital format, the relevant assistance is provided and the degree of such assistance varies, e.g. from a computer application that reads aloud individual words or phrases to presenting the same content in easy-to-understand language. Sometimes other options may be helpful as well, e.g. graphic organizers built into the text or a brief description provided automatically. Thus, students are given additional cues about core material when mastering the general curriculum.

Universal design also relates to how information is taught or presented and involves using a range of methods and strategies. With contemporary technology information can be easily converted from one format into another. Curriculum materials and teaching methods that are based on UD concept may contribute significantly to students' learning achievements.

- Respecting diverse needs of different student groups in curricula ensures and improves their accessibility and help avoid the need for further adaptations. For instance, the curriculum material on electronics may take into account its compatibility with assistive devices to enable lay persons program these devices easily with minimum content knowledge.

- Providing opportunities to adapt materials and their formats gives students an opportunity to choose formats that are best suited to their learning needs. For example, using a digital text will enable learners to convert written text into audio and vice versa, change the font size, colour etc. Students may also find digital materials helpful in such activities as decoding information, problem solving, seeking information about unfamiliar concepts, etc.

- Using video and audio multimedia will allow for different ways of presenting new concepts and enable students to assess the content using different sense organs. Thus, computer simulation exercises can include video descriptions to help students, including learners with special needs and disabilities, visualize challenging concepts.

- Providing complex three-dimensional teaching and learning materials suitable for student ability and developmental levels. For example, students with dyslexia (difficulty in learning reading skills) may benefit from supports that convert printed text to sound - this will enhance their ability to perceive information.

- Presenting information in different ways to support diverse learning styles and intelligences, e.g. presenting information orally, visually, through drawings and photographs, kinesthetically (modeling, demonstration) to encourage student interaction with the new concepts.

However, there is an important difference between access to information and access to learning. A student with access to information may know learning strategies, whereas a student who has access to learning knows how to apply them. This opens the way to independence and further success in life. Therefore, the purpose of universal design in relation to teaching and learning is to ensure effective learning process that:

- respects a broad spectrum of student differences, e.g. different developmental levels, diverse interests and needs;

- is based on the general curriculum that is delivered with a certain flexibility, i.e. at the level that is appropriate for a particular student and that challenges them at the same time;

- ensures progress and achievement for every student in the framework of general learning goals, rather than create separate sets of goals and curricula; this approach implies the highest possible expectations for all students;

- is designed to be inclusive, i.e. teaching methods and assistive technologies are considered at the early stage of developing the curriculum and don't need to be incorporated additionally.

To summarize, universal design creates solutions to empower active and full participation in society and contributes to independent living. It is predicated on the assumption that human diversity is natural and not something necessarily related to limitations. No two people are exactly the same, and similarly no two people have exactly the same abilities. Abilities may differ depending on the activity each individual is involved in or the environment where that activity takes place. Therefore, the UD concept respects person's individual abilities and serves to implement the accessibility principle.

#### REFERENCES:

1. UNESCO. Guidelines for inclusion: Ensuring access to education for all [Electronic resource] - Retrieved from <http://www.unesdoc.unesco.org> (12.08.2011); UNESCO. The flagship on education for all and the rights of persons with disabilities: Toward inclusion.[Electronic resource] - Retrieved from: <http://www.unesco.org> (12.08.2011).

2. Kolupayeva A., Taranchenko O., Danilavichute E. (2014), Special Education Today in Ukraine, in Anthony F. Rotatori, Jeffrey P. Bakken, Sandra Burkhardt, Festus E. Obiakor, Umesh Sharma (ed.) Special Education International Perspectives: Practices Across the Globe (Advances in Special Education, Volume 28) Emerald Group Publishing Limited, pp. 311 - 351

3. Tim Loreman, Joanne Deppeler, David Harvey «Inklusive Education. A practical guide to supporting diversity in the classroom». RoutledgeFalmer, London and New York, 2005

4.EADSNE. Special needs education in Europe. [Electronic recourse]. - Retrieved from -<http://www.european-agency.org> (12.08.20).

5. Kolupayeva A.A., Taranchenko O.M. Osvita ditei z osoblyvymy potrebamy za chasiv nezalezhnosti Ukrayiny': etapnist u strategichnomu vymiri [Education of children with special needs during the independence of Ukraine: stage in a strategic dimens]/ A.A. Kolupayeva, O.M. Taranchenko // Osoblyva dytna : navchannya i vyhovannia. - № 3(79). - 2016. - S. 7 - 18.

***Алла Колупасєва, Лариса Наконєчна Універсальний дизайн у підготовці та навчанні: підходи, визначення та використання***

*В статті представлено основні чинники універсального дизайну, який застосовується у навчанні, серед яких: доцільне використання, гнучкість у користуванні, дієве викладання, множинні засоби представлення матеріалу, можливості сприйняття матеріалу незалежно від сенсо-моторних можливостей. Використання універсального дизайну у процесі інклюзивного навчання забезпечує індивідуальний підхід на основі врахування різноманіття та забезпечує прогрес і успішність кожного учасника навчального процесу.*

*Універсальний дизайн створює умови для розширення можливостей особи з інвалідністю до активної та повної участі в суспільній взаємодії та сприяє самотійному життю. Він базується на припущенні, що різноманіття людей є природним, і не обов'язково пов'язане з тими чи іншими обмеженнями. Жоден з двох людей не є однаковими, і жоден з двох людей не має однакових здібностей. Здібності можуть відрізнятись залежно від діяльності, задіяної кожною особою, або в середовищі, де така діяльність відбувається. Тому концепція універсального дизайну поважає індивідуальні здібності людини та слугує для реалізації принципу доступності*

***Ключові слова:*** універсальний дизайн, інклюзивне навчання, доступність. освіта, освітнє середовище.