

The Alpha Generation and its Learning Style. Insight within a Central Asia Micro Training Courses Project

Luis M. Sánchez-Ruiz, Ph.D. , Nuria Llobregat-Gómez, Ph.D. , Javier Rodrigo-Illari, Ph.D. 
 Universitat Politècnica de València, Spain, < LMSR, nllobre, jrodrigo>@upv.es

Abstract– *The Bologna Process keeps evolving and nowadays it goes much further from the initial collaboration and recognition within Europe, and it encourages international collaboration and capacity building with non-European Union (EU) partners. Through one of such projects, meant for Central Asia partners and relevant environmental issues, a special attention has been paid to the development of new learning hubs which will exploit the micro-credential structure, and most interestingly, the new learning style of the alpha generation is considered as a must when teaching and learning methodologies are going to be implemented.*

Keywords– *Bologna Process, Micro-credential, AROHA learning style, iScholar.*

I. INTRODUCTION

The Bologna Process started with a series of European ministerial meetings and agreements to ensure comparability in the standards and quality of higher-education qualifications. Its denomination comes after the University of Bologna, which was founded by a student guild (studiorum) in 1088, and is considered to be the oldest one in continuous operation in the world. This process started with the Magna Charta Universitatum, issued on the occasion of celebrating its 900th anniversary in 1988 [1]. Initially, the France, Germany, Italy and United Kingdom education ministers signed the Sorbonne declaration in Paris in 1998 with the goal of "harmonising the architecture of the European Higher Education system" [2]. One year later the initial four countries were increased to a total of 29 countries joining the Bologna Process, which has been expanding and becoming more ambitious.

This process has meant a shifting of the European Universities educational guide and assessment towards a competencies and outcomes oriented education, [3-7].

The European, Education and Culture Executive Agency (EACEA) has evolved enriching the ties between European institutions, and new programs have emerged such as the Capacity Building in Higher Education (CBHE) action aimed at supporting international cooperation projects based on multilateral partnerships in the field of higher education. The proposals look for the relevance, quality, modernisation and responsiveness of higher education in third countries not associated to the Erasmus + programme for socio-economic recovery, growth and prosperity, between others [8].

One of the CBHE financed by the EACE is the project LESLIE (Land management, Environment & SoLid-Waste: inside education and business in Central Asia, ERASMUS-EDU-2023-CBHE-STRAND-1), [9].

Even though LESLIE is concerned with environmental

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issues, it has developed a whole work package to the new learning style of the alpha generation [10-13], the so-called AROHA style by Llobregat-Gómez [14] as the new learners are Active, perform Research actions, are Open-minded, and utilize Haptic devices.

In this paper we insight this new learning style is indeed what we call a Bi-AROHA style since in addition to the above characteristics that focus on the learner's attitude, we may recognize it as an Adaptive, Reflective, Open, Hands-on, and Authentic learning style, i.e. here we focus on the characteristics of the learning style itself.

II. THE LESLIE PROJECT

The LESLIE project brings together 14 partners from 5 countries, within a multidisciplinary consortium with complementary skills. The consortium is formed by Universities, Research centers and Ministries of Higher Education of Kazakhstan and Uzbekistan guaranteeing both feasibility of the outputs and sustainability of the project results, [9]. LESLIE partnership comprehends institutions in the field of higher education from three EU countries (Spain, Italy, Cyprus) and two Central Asian countries (Kazakhstan and Uzbekistan), with the following institutions involved:

- EU partners: Universitat Politècnica de València (UPV), University of Cassino and Southern Lazio (UNICAS), University of Cyprus (UCY)
- Kazakh partners: Sh. Ualikhanov Kokshetau University, Kokshetau (KOKSU), Al Farabi Kazakh National University, Almaty (KAZNU), Akhmet Yassawi University, Turkestan (AYU), Regional Environmental Centre for Central Asia (CAREC), Ministry of Science and Higher Education of Kazakhstan (MSHERK)
- Uzbek partners: Fergana Polytechnic Institute (FPI), Tashkent Institute of Irrigation and Agricultural Mechanization Engineers - National Research University (TIAME-NRU), Bukhara Institute of Natural Resources Management of the National Research University of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (BINRM-TIAME-NRU), Bukhara State University (BSU), International Agricultural University, Tashkent (IAU), Ministry of Higher Education, Science and Innovations of Republic of Uzbekistan (MHESIRU)

The management of the project is coordinated by UPV, with the close support of KAZNU in Kazakhstan and FERPI in Uzbekistan. These three partners coordinate the work with the rest of partners inside their correspondent areas of influence so solid management arrangements are foreseen.

Therefore, LESLIE partnership is formed by 11 universities, 1 international research center (CAREC) and the ministries in charge of the High Education systems of Kazakhstan and Uzbekistan. The active participation of the ministries in the activities developed by the project ensure that the outcome of the project is supported by the national administration while fulfilling all the required quality assurance processes.

The overall objective of the project focuses on designing and producing a set of Micro-credentials and digital educational tools on Sustainable Land Management (SLM), defined as the use of land to meet changing human needs (agriculture, forestry, conservation), while ensuring long-term socioeconomic and ecological functions of the land that will be introduced in Central Asian universities (Kazakhstan and Uzbekistan), updating their current academic offer at BSc and MSc levels, while ensuring that the needs of regulators and industries are fulfilled under the most recent and strict international standards.



Figure 1. LESLIE logo

The LESLIE logo shown in Fig. 1 with its brown, blue and dark blue colors, reflects the connection and interaction between land, water resources and environmental conditions and consequences.

The region's population of 77 million keeps growing at the rate of almost 2% per year, augmenting from the 1.4 factor of population increase since 2000. According to UN estimates, the average annual population growth rate in the region is projected at 1.1% until 2040. Demographics definitely favor economic growth in Central Asia.

In addition, the region's GDP has been increasing at an average rate of 6.2% per year in real terms. As a consequence, Central Asian countries are trying to find their place in the world economy, and SLM in Central Asian countries rises simultaneously as a risk and as an opportunity to guarantee the economic and sustainable development of the area.

This sustainable development is linked to a balanced approach to attracting external financial resources and implementation of regional programs.

The following challenges arise: lack of access to the sea, climate change, resource dependence and low level of

financial development, and of coordination in the water and energy complex

High Education Institutions (HEIs) in Central Asia are willing to confront these challenges by adapting their old educational programs and methodologies to a modern up-to-date educational tools which provide students with the required capacities inside a digital world. The Ministries of High Education of Kazakhstan and Uzbekistan (both partners of the LESLIE proposal) coordinate all bachelor (BSc) and Master's (MSc) Programs. Following Kazakh and Uzbek Ministries strategies, Sustainable Land Management (SLM) is one of priority to work on in their countries, comprising all components such as climate change, land management, water management, recycling, solid waste management, etc., the goal being to coordinate the preparing of specialists, as well as to meet the needs of future university students in 2030.

Only very recently, since 2022, many Central Asian universities have started introducing online education in their educational programs. Following this new trend, students are just starting to use online tools to get new digital skills. Many universities have built its own media centers to create high quality video materials for students, while the ministries coordinate and help to establish online/distant education through Higher Education Management Information System (HEMIS) and Course Management Systems (CMS) such as Moodle. However, there is still a clear gap between the needs of the modern students and the availability of specific scientific material for SLM educational programs.

The original LESLIE proposal obtained information from the Ministries and HEIs which are partners in the project consortium. A total of 4 HEIs partners in Kazakhstan and 5 partners in Uzbekistan were consulted to understand their needs (in central Asian countries). The following information comes from the specific questionnaires that were designed.

There is a need of improving SLM in Kazakhstan, following the Regional Environmental Centre for Central Asia (CAREC), which is involved into the establishment of education and training activities. All thematic programmes provide capacity building opportunities to their target groups represented by governmental and non-governmental actors from education, environment, water, climate and energy sectors. CAREC initiated its programme "Education for Sustainable Development" (ESD) in 2003 to promote sustainable development (SD) and ESD targets and principles in the formal, non-formal and informal learning in Central Asia.

Environmental challenges in Central Asia are mostly connected with limited level of education, capacity and competences of target stakeholders. There are many shortcomings in the educational systems of CA states, but the lack of understanding of the role of ESD in greening the economy and lack of funds for development of skills, capacities and competences for ESD of educators as well as of modern multimedia educational and learning materials are the ones that CAREC helps to improve, becoming an experienced partner in the education field.

It is worthwhile pointing out the environmental initiatives related to:

- Climate Change and Sustainable Energy (CCSE). The main objective of the programme is to support national policies of the Central Asian countries on climate change and sustainable energy, using approach of low carbon development, carbon sequestration, promotion of energy efficiency and deployment of renewable energy sources. Meanwhile, the Programme also foresees the capacity building for the national specialists and information exchange with regional and international experts as a crucial contribution for any interventions.

- Water Initiatives Support (WIS). Currently, the Central Asian countries are facing challenges in both water governance and water management systems. These are characterized by inefficient irrigation and drainage network, outdated legislative and normative documents and agreements at all levels, lack of awareness on the most pressing issues in water management and their solutions, insufficient involvement and participation of local communities in water management, and lack of incentive-based economic tools to support basin ecosystems. In Central Asia, there are hundreds of small transboundary river basins (STR), which accommodate about 1/7 of total population and provide 30-35% of water for irrigation. However, issues of STRs are not considered in the existing system of joint transboundary water management.

- Environmental Management Program (EMP). The Environmental Management Program (EMP) was launched to support the Central Asian Initiative (CAI) – a regional effort by five Central Asian states to get ready for the World Summit on Sustainable Development in Johannesburg in 2002. As a continuation of the initial process, the Program has been promoting the Shared Environmental Information System (SEIS) aimed to enhance the quality and comparability of environmental indicators and state-of-the-environment reporting of CA countries. The Program is also actively involved in the UNECE working groups like the Joint Task Force on Environmental Indicators and the Working Group on Environmental Monitoring & Assessment. Starting 2009, the Program has been implementing projects on payments for ecosystem services (PES) as well as economic valuation of ecosystem services (ES).

The needs of improving SLM in Uzbekistan are connected with the creation of cartographic resources, for example, creating thematic maps of areas with high ecological risk or showing the areas where they are located on the map for waste recycling. It is for hydrometeorological specialists that it is necessary to describe the changing conditions on the map and to develop a plan of measures to obtain climate variables in this area in the future. Today, many regulatory documents have been developed on the management of land resources. In the preparation of cadastral documents of land resources indicated in these documents, it is envisaged to create orthophoto plans of land resources in the area through remote sensing data, to develop a methodology for creating

content elements of digital maps, based on which the land data bank is compiled.

Further, developing the content of large-scale thematic atlases and introducing them to the public by placing them on websites. It is for each keyword that we are taught how to create themed cards in our specialty. Also, we will contribute to the increase of educational materials on the creative approach in explaining the modules to students, in their independent work.

The goal of sustainable development is to provide all resources for the future of humanity, to create a clean ecological environment, and to use natural resources effectively and rationally while determining the points of sustainable growth through systematic development with the help of modern information technologies and intelligence. Creating a digitized public land resource use database and access system for future generations and introducing it first to higher education and then to production.

In the process of creating a methodological guide for the undergraduate and graduate stages of education on land resources management, relying on the modern optimized approach of management, defining the methods and directions of sustainable management of land resources, and putting them into practice by modeling the system for the implementation of future strategic goals.

Climate change affects the economy in many places and the ability to use the right resources, helps people to get ready to adapt to change.

Water resources management increases the efficiency of water resources use in general. Also, through the digitalization of system management, it is possible to target the use of water resources, prevent excessive spending, avoid wasting water, and instill in the public the need to use the system wisely.

Some other issues that must be addressed and improved in Uzbekistan are as follows:

- Solid waste management - based on a comprehensive approach and strategic planning, processing solid waste, preparing products necessary for life or disposing of it in places that do not harm the population.

- Waste processing - improving the ecologically safe system of waste-related activities, for example, burying waste for growing agricultural products, making humus from it, and using it as fertilizer.

- Environmental hazards - priority use of the least ecologically hazardous materials, products, production facilities, and other objects, development of didactic resource cartographic projects: orthophoto plan and interactive maps to show the areas of environmental hazards to students and the general public.

- Environmental planning - preservation and quality of environmental objects (atmospheric air, water, land, soil, subsoil, biodiversity, protected natural areas) from anthropogenic influence and other negative influencing factors

- Legal aspects - whether the land is a resource or other resources, it is necessary to protect them based on the law, that

is, to protect them from a legal point of view, to preserve and improve their quality for future generations.

The overall LESLIE objective to design and produce a set of Micro-credentials and digital educational tools on SLM in Central Asian universities (Kazakhstan and Uzbekistan), is developed through FIVE specific actions:

1. To create a Hub on Sustainable Land Management in Kazakhstan and Uzbekistan, integrating High Education Institutions (HEI), such as universities and research centres, together with regulators, private professionals, industries and stakeholders

2. To jointly design and implement a set of Micro-credentials on Sustainable Land management (SLM) to be offered to BSc and at MSc students of Kazakh and Uzbek universities, following the most recent and strict international standards

3. To produce a set of didactic tools in digital format that can be integrated as support material in the SLM BSc and MSc ONLINE educational programs

4. To integrate all the educational material inside a Single Online SLM Repository (Toolbox)

5. To develop a Pilot Future Learning Incubator which includes the application of new educational techniques using a STEHEAM approach to promote and disseminate SLM to the future 2030 university students.

Here STEHEAM refers to Science, Technology, Humanities, Ethics, Aesthetics and Mathematics. By doing this we are changing the original meaning of the term coined by Llobregat-Gómez [14] to expand the narrower perspective of STEM studies as a consequence of the irruption of the new digital citizens in our societies, and originally standing the letter “E” in reference to the relevance of acquiring bilingual skills in English language for non-English native speakers through the use of modern digital tools.

Furthermore, we understand that Ethics is an essential transversal competency in technology and engineering to foster responsible innovation and decision-making, particularly when dealing with environmental issues. Indeed, Ethics plays a major role to understand, empathize, and commit to the UN Sustainable Development Goals SDG, [15].

The other two letters added to the already well-known STEM perspective refer to the importance of integrating Humanities to help students understand the societal context and implications of technological advancements, and promote Aesthetics to Encourage creativity and design thinking by integrating arts into the curriculum. This nurtures innovation and helps students appreciate the aesthetic dimensions of technology and engineering.

This STEHEAM expanded perspective becomes a fully student-centered approach to education, having in mind the new digital environment as well as the special peculiarities of environmental engineering with its concern on pressing environmental issues such as climate change, pollution, and sustainable development which fit within SDG.

The LESLIE project specifically contributes to the Green Deal overarching priority of the European Commission, to the

external dimension of EU internal policies in the field of education and to the Digital transformation of the HEI in Central Asia. LESLIE will be developed during a 3-year period and is organized in six work packages: Project Management, SLM International Hub, SLM Future Learning incubator, SLM-Microcredentials, SLM Online-Toolbox, Impact and Dissemination.

III. MICROCREDENTIALS

The arising of European Higher Education Area (EHEA) brought up the implementation of new degrees, and even new structures such as the European Universities Initiative, [16].

Despite sharing a basic common three-cycle structure in the EHEA participating countries, there has been room for diversity to special national circumstances as depicted by Cattani et al. [17].

In addition to the standard organization of higher education studies and quite likely motivated by the awareness of the so-called Third Mission of universities, and its general contribution to society in a broad sense, new types of activities have appeared [18-22].

One of the new contributions is the development of micro-credentials, a concept not universally accepted or even defined in some countries even though some universities are already offering micro-credentials, [23, 24].

The common sense and understanding is that micro-credentials concept refers to short courses that certify some type of knowledge, skill or competency in a specific area.

The LESLIE project aims at developing this concept within the context of Central Asia.

It is worth while pointing out that even though this concept has not been defined in Spain, yet, UPV has developed some training courses in collaboration with partners from Bulgaria, Romania, and Lithuania what might be considered some pilot experiences of micro-credentials awarding within another Erasmus+ Programme action, namely the KA 202 - Cooperation partnerships in higher education, with the project called Boosting the Green Future via University Micro-Credentials B-Green-ED, [25].

IV. CURRICULUM DEVELOPMENT

Undoubtedly, the COVID19 brought out a generalized use of blended digital methodologies to cope with the online education that the unexpected circumstances forced, and teachers, tutors and parents were able to go through it with its aid, [26-27]. In any case, these new methodologies would have arrived, earlier than later, due to the new student needs, and the new digital technologies all around the world, [28-31].

The field of engineering is characterized by constant technological advancements and emerging challenges. To prepare students effectively, curricula must incorporate the latest scientific knowledge, technological innovations, and industry practices. Consequently, a regular updating of the curriculum ensures that students acquire current knowledge and skills necessary for solving real-world problems.

In this line, the rise of artificial intelligence, machine learning, and sustainable technologies is bringing profound implications for engineering practice, [32-35].

Global issues such as climate change, resource depletion, and environmental degradation demand innovative solutions from engineers. The curriculum must evolve to address these challenges, emphasizing sustainability, resilience, and ethical considerations. For example, incorporating sustainability-focused projects and case studies in environmental engineering courses can enhance students' understanding of sustainable practices and their role in addressing global challenges.

To prepare students for a complex modern world, higher education must foster critical literacies, including critical viewing skills, digital literacy, and ethical reasoning. These literacies will help to educate well-rounded, responsible, and thoughtful engineers.

In an information era, overloaded with all type of informational, authentic and fake, the ability to evaluate media and digital content is essential. Critical viewing skills enable students to discern credible information, recognize biases, and understand the implications of media representations.

In this line, engineering students should get used to analyzing media portrayals of technological innovations or environmental issues, evaluating their accuracy and potential impacts on public perception and policy.

Digital literacy encompasses the ability to use digital tools and platforms for research, communication, and problem solving. As technology becomes increasingly integral to engineering practice, digital literacy is a foundational skill. Incorporating training on advanced software tools, coding, and data analysis in the curriculum can enhance students' digital competencies, preparing them for modern engineering challenges.

V. THE NEW LEARNING STYLE

The Alpha generation—formed by those born from 2010 onwards—has found a world where digitalization in the common standard marking a significant shift in higher education. This generation, also named HapGen or Haptic Generation in [10-13], is characterized by their expert command of haptic interaction and a proactive approach to learning in which process they are Active, perform Research actions, in an Open-minded form, and utilize Haptic devices from where the AROHA acronym was coined, [14].

This learning style means a major challenge, at such a point that the LESLIE project considers it in one of its work packages. The project has doubled this AROHA style by considering new features of the learning style that the Alpha generation requires, namely this style should be characterized by being:

- Adaptive: Tailoring educational content to individual needs ensures that each student can learn at their own pace and according to their unique strengths and weaknesses. Adaptive learning platforms like Smart Sparrow can provide

personalized engineering coursework that adjusts in real-time based on student performance.

- Reflective: Encouraging students to reflect on their learning experiences helps them develop critical thinking and self-assessment skills. Engineering courses can include reflective journals or discussion forums where students analyze their progress and identify areas for improvement.

- Open: Promoting openness in education by using open educational resources and collaborative platforms, e.g. taking advantage of free online resources, such as MIT OpenCourseWare, to supplement their learning.

- Hands-on: Providing practical experiences is crucial for mastering engineering concepts. Haptic devices and virtual labs can simulate real-world engineering challenges, allowing students to gain practical skills in a controlled environment.

- Authentic: Connecting learning to real-world applications makes education more relevant and engaging, e.g. by incorporating industry projects, internships, and case studies, so that students might enjoy the opportunity to apply their knowledge to real-world problems.

Hence we may think about a Bi-AROH style as the acronym AROHA style gets doubly relevant since it refers to the learner's attitude, as well as to the characteristics of the learning style itself.

In addition to the above, Alpha learners should benefit from immersive learning experiences, providing a rich, interactive learning platform that enhances their understanding and retention, [35-36].

New environments taking advantage of artificial intelligence and virtual reality are to come if we aim at educating the Alpha generation with tools that are close to the way in which they are used to learning.

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