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Skills and competence evaluation guide (WP2 – Deliverable 2.3)

Project Acronym:	BUGI
Project Full Title:	Western Balkans Urban Agriculture Initiative
Project No.:	586304-EPP-1-2017-BA-EPPKA2-CBHE-JP
Funding Scheme	Erasmus Plus
Coordinator:	University of Sarajevo
Project Start Date:	October 15, 2017
Project Duration:	36 months



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DOCUMENT CONTROL SHEET

Title of Document:	BUGI
Work Package:	WP 2 - Development
Last Version Date:	10/06/2019
Status:	Final
Document Version:	v.02
File Name:	Deliverable2._Skills and competence evaluation guide.docx
Number of Pages:	17
Dissemination Level:	Internal

VERSIONING AND CONTRIBUTION HISTORY

Version	Date	Revision Description	Partner responsible
v.01	22/10/2018	First draft version	Francesco Orsini, Giuseppina Pennisi, Pier Giacomo Sola (UniBO)
v.02	10/06/2019	Final	SC



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LIST OF ABBREVIATIONS

EU	European Union
FAO	Food and Agricultural Organization (United Nations)
HEI	Higher Education Institute
LLL	lifelong learning
NGO	Non-government organisation
UDG	University Donja Gorica
UHZ	University "Haxhi Zeka" of Peja
UNIBO	University of Bologna
UNMO	University "Džemal Bijedić" of Mostar
UNSA	University of Sarajevo
UP	University of Prishtina
SME	Small and medium-sized enterprise
SWUAS	South-Westphalia University of Applied Sciences
UL	University of Ljubljana
UNDP	United Nations Development Programme
WB	Western Balkan
WP	Work Package



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1. INTRODUCTION WP2 “CURRICULUM MODULES AND LLL CENTER PROGRAMS DEVELOPMENT”: GENERAL DESCRIPTION AND OBJECTIVES

WP2 “Curriculum modules and LLL center programs development” includes the activities necessary for design and implementation of new master study curriculum and LLL programs on urban agriculture. The curriculum is two years study program with 120 ECTS with basic obligatory modules and closed list of elective modules to provide specialization. Study contents are organized in 5 modules: introduction to UA, food production systems, UA entrepreneurship, urban planning and resources, and use of technologies and ICT in UA. Modules meet objectives and priorities for each partner countries’ needs based on results delivered in WP1. Needs analysis (see Deliverable 1.2) named communication a required soft skill for urban agriculture entrepreneurship and an issue to be covered in urban agriculture entrepreneurial education. Other soft skills considered important were creativity, time management, and flexibility. Considering hard skills, all subjects (plant production, machinery/engineering, marketing/trading, project planning, business planning, communication and networking, urbanity) are named by more than 40% of the surveyed people to be of value for UA entrepreneurial education. About two thirds named plant production (68%) and project planning (65%) followed by marketing/trading (53%), urbanity (51%), communication/networking (50%), and business planning, administration and finances (50%). Also specific training needs among these topics were investigated. Crop protection, plant nutrition and cultivation practices were the most required skills in the topic of plant production. Irrigation, greenhouse technology and precision agriculture were the most required skills in the topic of machinery/engineering. Quality management and customer relations were the most required skills in the topic of marketing/trading. Business, project planning and project management were the most required skills in the topic of business, administration and finances. Urban economy and urban planning were the most required skills in the topic of urbanity.

Within WP2 modules and modes (basic or advanced), objectives and learning outcomes for master study and LLL program are defined through the development of a curriculum draft (Deliverable 2.1). Each of modules 2, 3,4 and 5 are offered in two modes: basic and advanced. Basic mode provides more theoretical education, while advanced is based on Problem Based Learning system (PBL) and Experiential Learning (EL). Thanks to a specific guide (Deliverable 2.2), a methodology for PBL and EL with regard to defined learning outcomes and competencies is established. A guide for students’ skills and competence evaluations is created to define and describe a competence inventory and link it to the skills (Deliverable 2.3). This reference system is the core instrument both for planning and for the validation of the competence oriented learning. Module Placement Guide (Deliverable 2.5) assess student’s current readiness to register for advance mode courses within the modules. This is necessary due to the interdisciplinary nature of new curriculum. Since module



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advance mode is based on PBL and EL, students are expected to have theoretical knowledge regarding field of the study prior to the course registration. Diploma supplement providing a standardized description of the nature, level, context, content and status of the studies is created for partner HEIs (Deliverable 2.6). Besides standard context, a special part includes descriptions of acquired competencies according to the EUROPASS cluster: social and organizational competences described in the field of study. A multilateral inter-institutional agreement (Deliverable 2.7) ensures credit mobility, virtual and physical students and staff mobility between the partner HEIs.



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2. ABOUT THIS DOCUMENT

Deliverable 2.3 “**Skills and competence evaluation guide**” is prepared on the basis of several sources, namely: Deliverable No. 1.1 Survey guide (that delivered methodological framework and instruments, as well as provided common research methodologies within different experts groups); Deliverable 1.2 Regional and EU action plans and strategies report (presenting the preparatory activity for development of curriculum and LLL programs); Deliverable 1.3 Farms models in region (that analysed existing business models in partner countries, their characteristic, success factors and problems, providing a better idea of UA economic strategies in general and characteristic patterns of UA business models in the region); Deliverable 1.4 Food supply chains analysis (that identified food supply chains in region and their characteristics, advantages and disadvantages); Deliverable 1.5 Consumers preferences surveys (that identified and analysed the consumer preferences regarding price, attitudes and habits, distribution, products and promotion, in order to shape the BUG curriculum for the practical exercise and for subjects dealing with new products development); Deliverable 1.6 City-adjusted farm strategies in Bosnia-Hercegovina, Montenegro and Kosovo (that analysed and proposed different business models for UA in partner countries and explored their advantages and disadvantages), and mainly on Deliverable 2.1 Curriculum Draft. All these sources form the basis for D2.3 that aims to become a guide for people that has to evaluate students’ skills. Reference systems will be developed by each WB Partner University for learning outcomes and the level of competence in accordance to their modules. This reference system should be the core instrument both for planning and for the validation of the competence oriented learning, monitor progress and create description of competence in student Diploma Supplement.



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3. PURPOSE OF THE GUIDE

This guide intends to provide a guide for students' skills and competence evaluations. It starts defining the competence inventory, starting from the learning outcomes identified by the draft curriculum, in accordance with the master study to be developed. Furthermore, the document starts from the consideration that evaluation in experiential and problem does not only taken into account the instrumental competences, but also the interpersonal and systemic ones.

It is then crucial to raise awareness of teachers about the importance of acquiring the evaluations skills necessary for this complex task. Efforts have been made to simplify the evaluation competences, while ensuring that they remain sufficiently specific so that they can be clearly applied within different systems. This document also provides potential usages of the competencies and common and specific competencies for the evaluator team. Evaluations should be conducted with professionalism and integrity. Professionalism should contribute towards the credibility of evaluators, as well as the evaluation function. Key aspects include access to knowledge; education and training; adherence to ethics and to these norms and standards; utilization of evaluation competences; and recognition of specific knowledge, skills and experience. This should be supported by an enabling environment, institutional structures and adequate resources.

Competences can be defined as "clusters of related knowledge, skills, abilities and other requirements necessary for successful job performance." Every position has its own set of competences. In an educational context, performance development tools are used to assess the strengths of individuals and to determine areas that need development.

In our analysis, an evaluator is anyone who is directly involved in planning and conducting an evaluation. The work of an evaluator includes elaborating the evaluation design, proposing the evaluation approach and method, collecting and analysing data, drawing appropriate conclusions, making recommendations and communicating evaluation findings.

4. EXPECTED SKILLS AND COMPETENCES TO BE ACQUIRED BY THE STUDENTS

The learning outcomes identified by the curriculum draft (Deliverable 2.1) have been grouped according to the three main categories of competences:

- Instrumental: i.e. cognitive, methodological, technological, communication competences
- Interpersonal: i.e. individual, social competences
- Systemic: i.e. organisation, enterprising spirit, leadership competences

In particular, we can better detail some of the previous items, in order to better clarify their meaning:

- Cognitive: analytical, critical, reflective, creative
- Methodological: time management, problem solving, decision making, learning strategies, planning
- Social: interpersonal communication, teamwork, conflict management, negotiation

Starting from this scheme, at the end of the BUGI curricula, the students will:

-acquire and develop knowledge and skills related to urban agriculture, urban ecology and urban planning	instrumental
- identify and assess entrepreneurial opportunities and innovation possibilities related to urban agriculture activities	systemic
- understand and explore the multifunctionality of urban agriculture in order to redesign and redefine urban spaces	systemic
-understand design and transition of food sociotechnical systems (STS) in context of urban agriculture	systemic
- organize and lead multi-disciplinary groups with experts, including planning, setting up, coordinating, team working, business development, problem-solving skills	interpersonal
- plan green areas within the city framework	instrumental
- write a business plan for development and management of economic activities	systemic
- analyse urban food supply system and be able to shorten the food supply chain	instrumental
- identify the constrains related to the food supply chain and the main limiting factors for developing	instrumental
- identify actors and stakeholders of urban food system and food supply chain	systemic
- understand small-scale production system in small areas	instrumental
- understand traditionally rural-based enterprises adapted farm strategies to a more urban environment	instrumental

- understand large-scale farms and agro-enterprises in local economic development and urban food security at the city level	instrumental
- identify potential of alternative food supply chain	instrumental
- identify opportunities offered by the city in terms of market potential and access to inputs and infrastructure	systemic
- identify entrepreneurs in Urban Agriculture	systemic
- detect customer groups relevant for the business idea	systemic
- analyse the demands and behaviours of customer groups	systemic
- choose the right market research approach to get insights into customers' thinking and decision-making	systemic
- describe the urban ecological issues	systemic
- evaluate the impacts of humans in the urban environment	systemic
- describe the link between cities and biodiversity	systemic
- argue about UA advantages besides production	systemic
- identify functions and services from UA	instrumental
- evaluate factors of UA sustainability	instrumental
- plan and manage ecological agricultural systems	systemic
- identify and understand modern information technology trends in the context of urban agriculture	systemic
- understand the basic concepts of Internet Technology to identify the possibilities of application in precise urban agriculture and food production	instrumental
- understand the development and current status of precise agriculture and smart food production;	instrumental
- identify and understand the application of information technologies for smart logistics;	systemic
- Identify the opportunities and risks associated with the application of modern information technologies in urban agriculture;	instrumental
- understand the goals, the main steps, and challenges in implementing the systems for precise agriculture and smart food production in the urban environment	instrumental
- identify and adapted definition and major concept of sustainable agriculture	instrumental
- understand existing and define new sustainability indicators in urban agriculture	instrumental
- understand the difficulty of plant production in terms of sustainable use of environmental resources	instrumental
- analyse interventions in agriculture, which undoubtedly affect the environment, and make them sustainable, and also economically, socially and ethically acceptable	instrumental
- describe and interpret contemporary trends in sustainable cultivation of plants, particularly Integrated, Biological and Organic methods	systemic

- understand how the changes to sustainable management affect economic policy and rural development	systemic
- monitor and implement the most important current FAO and EU agricultural programs and programs of scientific research in EU agriculture	instrumental
- identify and assess specific problems within a holistic approach and apply	interpersonal
- recommend guidelines for sustainable development in policy practice at local, national and global levels	instrumental
- use basic principles of fruit growing (pruning, nutrition)	instrumental
- understand the importance and implementation of fruit growing production in the conditions of Urban farming	instrumental
- understand the requirements of specific fruit plants	instrumental
- be able to transfer the acquired knowledge to others	interpersonal
- identify a customized definition of urban agriculture, depending on the purpose and context	instrumental
- understand the development and current status of crop and vegetable urban agriculture production worldwide	instrumental
- understand the development of different types of urban agriculture depending on the level of development, goal and context	instrumental
- understand historical and contemporary models and types of vegetable production in urban agriculture, and their role and significance	instrumental
- identify classical and modern production systems	instrumental
- use tools and methods for crop and vegetable production in urban agriculture	instrumental
- understand the concepts, types and goals of specialization and diversification of crop and vegetable production in urban agriculture, and understand their advantages and disadvantages	instrumental
- introduce and use ICT tools and methods for producing vegetables in urban agriculture and automation of production	instrumental
- know the most modern and most successful business examples based on innovation	systemic
- understand specific factors that affect crop and vegetable food safety and quality of food produced in urban agriculture	instrumental
- self-diagnose a possible lack of certain nutrients	instrumental
- implement the necessary measures for improving soil fertility and plant nutrition in urban conditions	instrumental
- apply appropriate methods of irrigation and drainage in urban conditions	instrumental
- get knowledge about how pathogens affect the physiological functions of plants	instrumental
- learn about the genetic bases plant diseases	instrumental
- learn about the major groups of plant pathogens	instrumental
- recognize specific injuries and symptoms on the most important groups of cultivated plants	instrumental

- get familiar with characteristics and modes of action of individual groups of pesticides	instrumental
- determine their health status of plants	instrumental
- manage food production	instrumental
- master the most important knowledge of floristry.	instrumental
- master the basic knowledge of the possibilities of using ornamental plants in accordance with the Florentine Classification	instrumental
- realize the possibilities for organizing the basic processes of production and maintenance of ornamental plants.	instrumental
- classify and identify aromatic and medicinal plants for UA	instrumental
- understand the production technology and effectively applying current methodology for problem solving	instrumental
-know the procedures of post-harvest processing and impact of drying and storage on quality of aromatic and medicinal plants	instrumental
- learn the most important active components of selected aromatic and medicinal plants	instrumental
- identify the useful application of selected plants in nutrition, pharmacology, cosmetic etc...	instrumental
- manage smaller number of colonies (hives)	instrumental
- recognize the anatomy, physiology and the development of bee colonies	instrumental
- demonstrate the ability for independent appearance on the market of bee products	instrumental
- understand the economic environment of the bee products	instrumental
- create the business plan for small number of bee colonies, calculates the cost of bee products, preparing products for market;	instrumental
- use the basic technology of production, packing, storage and transport of bee products	instrumental
- analyse and interpret the results of the basic physical and chemical analysis of honey	instrumental
- recognize importance of mutual cooperation with other branches of agriculture	instrumental
- explain the relationship with other agricultural production (fruit, crop production) and the implications of beekeeping production	instrumental
- define appropriate ways to protect beekeeping production	instrumental
- understand the biological and engineering principles of biogenic waste materials recovery into useful substances, biogas, organic fertilizer, compost or soil improver, and growing media	instrumental
- realizes both the benefits and potential dangers in the use of biogas, organic fertilizer, compost or soil improver, and growing media	instrumental
- understand the principles of holistic management of biogenic waste	instrumental
- know how to analyse the quality of the products and how to design new commercial products	instrumental

- be able to lead an industrial composting or biogas plant	instrumental
- get the essential functional skills that are needed for environmental management of agricultural or horticultural holdings	instrumental
- understand the basic concepts and problems of sustainable farm management	instrumental
- understand basic techniques and skills in the design and use of GIS in agriculture/urban agriculture	instrumental
- produce vegetative and generative material in different types of plant production	instrumental
- use different sensors and their agricultural application;	instrumental
- understand the basic concepts of smart agricultural systems and their networks	instrumental
- understand the basic working principles of microcontrollers and development of web and mobile applications in field of the agriculture	instrumental
- know future trends including drone applications	instrumental
- define the concept of Smart Sustainable Cities from the perspective of various disciplines and cultures	instrumental
- name and structure key elements and fields interlinked in SSC, their coverage in further course modules and future employment options	instrumental
- know the general outline of the history and existing EU policy context on Smart Sustainable cities	instrumental
- understand the general current economic, social and environmental trends that jeopardize sustainable growth of cities.	instrumental
- describe critically the (future) sustainability challenges (needs) cities are/will be confronted with. Application	instrumental
- apply various models, methods, techniques for measuring / monitoring smart sustainable cities analysis	instrumental
- analyse / compare sustainability / sustainability aspects of cities by applying models for measuring sustainable cities	instrumental
- prepare a business plan	systemic
- demonstrate the basics of bookkeeping	systemic
- prepare budget and forecasting statements	systemic
- implement production / inventory management tactics	systemic
- summarize business financing options	systemic
- produce marketing strategies	systemic
- analyse the implication of taxes	systemic
- forecast and develop business strategies to sustain and grow a landscape design company	systemic
- understand the importance of using renewable energy sources	systemic
- understand of the advantages of using renewable energy sources in relation to conventional systems	systemic
- identify ways of using renewable energy sources in agriculture	systemic

- identify possible barriers to the use of renewable energy sources	systemic
- be able to estimate investment and exploitation cost of renewable energy systems	systemic
- understand terms and practice of urban agriculture	systemic
- understand how urban resource systems function	systemic
- identify specific ways that urban agriculture can be applied	systemic
- describe and debate the feasibility of urban agriculture and its role in our urban food system	systemic
- recognize the limitations and benefits of urban horticulture production	instrumental
- analyse major issues and constrains on urban engineering	instrumental
- identify the constrains related to the agricultural power and machinery	instrumental
- identify agricultural electrification and application	instrumental
- understand small-scale production system and agricultural structures in small area	instrumental
- understand soil and water conservation and conservation structures	instrumental
- understand surveying equipment, hand and power tools, measuring devices, tools, and diagnostic equipment	instrumental
- improve field efficiency, matching machine size and capacity: theoretical, effective, and actual field capacities	instrumental
- identify and understand planning and urban design	systemic
- understand the application of basic urban design	systemic
- identify and apply planning and design methodologies that contribute to urban sustainable development, including tools for assessment	systemic
- identify main characteristics of different city districts and analyse these in relation to urban sustainable development	systemic
- understand the goals, the main steps, and challenges in planning and urban design	systemic
- identify and characterize main actors of urban sustainable development	systemic
- understand general principles of the agronomy and cultivation of aromatic and medicinal plants and the tools for their application	instrumental
- understand to read, analyse, and discuss research literature dealing with medicinal and aromatic plants	instrumental
- identify evidence-based information for the cultivation and use of medicinal and aromatic plants	instrumental
- analyse and appraise correct information	interpersonal
- describe the concept of the Information Science and Communication	interpersonal
- describe the characteristics of scientific and technical information	interpersonal
- describe the main digital library catalogues	systemic
- know the electronic journals and full-text databases	interpersonal
- know the bibliographic data editing in text processors	interpersonal
- have basic knowledge of bee morphology and physiology	instrumental
- associate apiculture with local agriculture products, ecosystem services	instrumental

and human history	
- understand the importance of honey bees as critical pollinators for both natural environments and crops productions	instrumental
- start and maintain an apiary	instrumental
- control bee diseases and pests	instrumental
- have a broad idea of international research in apiculture	instrumental
- be familiar with general classes of insects, diseases and weeds in urban agriculture	instrumental
- know how to determine the pests, diseases and weeds in urban agriculture	instrumental
- recognize the morphology, anatomy, biology and ecology of pests, diseases and weeds in urban agriculture	instrumental
- know the ways of causing damages to urban agricultural crops	instrumental
- determine the most appropriate measures for the prevention and management of these pests in crops	instrumental
- apply the gained knowledge into the praxis	systemic
- identify and understand urban agriculture production systems;	systemic
- understand the basic concepts of urban agriculture and production systems	systemic
- identify and understand the application of productions systems in urban agriculture;	systemic
- understand the goals, the main steps, and challenges in application of production systems in urban agriculture	systemic
- understand to read, analyse, and discuss research literature dealing with urban agriculture production systems	systemic

5. EVALUATING STUDENTS' COMPETENCES

One of the best documents outlining the methodology to be used when assessing competence in several different circumstances where an evaluation design and processes is taking place, has been issued by UNEG, the United Nations Evaluation Group, in June 2016.

As far as the scope of the BUGI project, it is relevant to consider that the evaluators are requested not only to have strong competences on the scientific and technical domain concerned with the Urban Agriculture sector (professional foundations), but must be provided with four more key skills, in order to assess the students not only about their instrumental competences, but also concerning the interpersonal and systemic ones. In particular the evaluator should have the following additional skills:

- Technical Evaluation Skills
- Management Skills
- Interpersonal Skills
- Promoting a Culture of Learning for Evaluation

Technical Evaluation Skills

Technical evaluation skills are fundamental to ensuring high-quality evaluations that are relevant, reliable and that support the translation and use of evaluation findings to inform and influence future programme and policy decisions. Technical evaluation skills include: knowledge on identifying evaluation needs and developing evaluation designs with focused evaluation questions; solid knowledge on evaluation approaches and methods; and the analytical skills to interpret findings and to formulate conclusions and, if relevant, recommendations that are clearly related to the findings and conclusions.

Management Skills

Management skills are critical to leading teams conducting evaluations (e.g. to be the evaluation team leader) and to manage or in other ways supervise evaluation implementation. While management skills include many of the skills required to manage any project, management skills for evaluation relate to skills specific for managing evaluations.

Interpersonal skills

Interpersonal skills are important in ensuring that engagement with stakeholders involved in the evaluation process at all stages is effective and that the subsequent use of evaluation is strengthened. These skills are often referred to as 'soft skills' that help improve the influence that the evaluation has with its stakeholders. Skills include communication, facilitation, negotiation and knowledge sharing.

Promoting a culture of learning for evaluation

Skills to promote a culture of learning for evaluation within an organization, to engage users and beneficiaries in evaluation processes and to broaden the use of evidence in decision-making are important, as some of the main purposes of evaluation.



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For more information, we suggest to read the *Evaluation Competency Framework*, UNEG, 2016, at: <http://www.unevaluation.org/document/download/2610>.