

WaSec selected as Best Model Project

By Saed Khayat (PTUK)



Fig 1. Dr. Saed Khayat

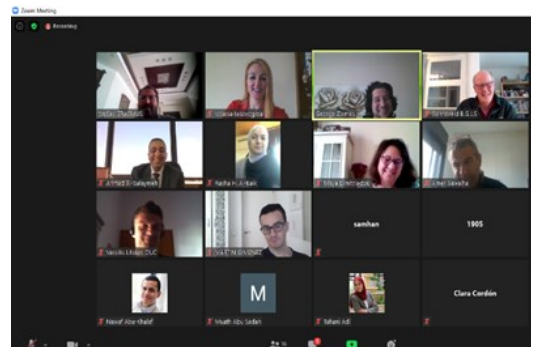
The year 2020 began with a hope. A hope that brought out opportunity of strengthening our new projects and consolidating the learnings in ongoing projects. Little did one expect a global pandemic to strike and the entire world pushed into lockdown. However, WaSec did continue to move forward despite these obstacles. The original design of the WaSec project is based on construction of Virtual Learning platform with innovative teaching approach, based on blended learning system, before the pandemic forced all the world to go for online teaching system. That's why the innovative techniques in water education cover instant needs, and thus expressed a best model that the education systems worldwide could adopt in response to global pandemic. Despite these difficulties WaSec continue its activities, and achieved its objectives successfully. Selecting WaSec as a **best model project from the 55 projects funded in Palestine since 2015 by ERASMUS +**, reflect the high quality of the project design and the selection upon needs. Cooperation between consortium partners was unique, distinguished and effective.

We believe that integrated collaborations between partners, is the main reason why the WaSec project has been **so successful**.

Thank you, WaSec Consortium, for such fruitful synergetic work.



Fig 2. Four different meetings of the Wasec partners in four different countries



Climate Change and Water Resources in the Mediterranean

By George N. Zaimes (IHU)



Figure 3. MedECC scientific team

This brief is based on the report prepared by “MedECC (2020) Climate and Environmental Change in the Mediterranean Basin – Current Situation and Risks for the Future. First Mediterranean Assessment Report [Cramer, W., Guiot, J., Marini, K. (eds.)] Union for the Mediterranean, Plan Bleu, UNEP/MAP, Marseille, France, 632pp. ISBN: 978-2-9577416-0-1 DOI: 10.5281/zenodo.4768833 (see <https://www.medecc.org/first-mediterranean-assessment-report-mar1/>).

This report was prepared by the independent network of Mediterranean Experts on Climate and environmental Change (MedECC). The report was written by 190 scientists from 25 countries, all contributing in individual capacity and without financial compensation. The author of the brief was also one of the scientists as a Lead Author that contributed in the writing of this very important report for the Mediterranean.

The purpose of this brief is to present the major results of the report on water resources.

1. Water resources in the Mediterranean are scarce. The reason is because they are limited, unevenly distributed and in some areas not accessible.
 - 1.1 The northern Mediterranean has the majority of water resources (72-74%) that means 180 million people in the southern and eastern Mediterranean countries suffer from water scarcity and 80 million people from extreme water shortage.
 - 1.2 River discharge is characterized by high temporal - seasonal and inter-annual - variability and groundwater is the main source of freshwater for some Mediterranean countries.
 - 1.3 The transboundary nature of many river basins and aquifers in the region further complicates their sustainable management.
2. The scarcity of water resources causes conflicts for the different sectors of water use (agriculture, tourism, industry, people, also biodiversity conservation).
 - 2.1 In southern and eastern countries, agricultural use reaches 76-79%. In the northern part, the four sectors are much more balanced.
 - 2.2 The irrigated land of the total cultivated area in the Mediterranean is about 25% (but more than 70% in Egypt, Israel, Lebanon, Greece).
 - 2.3 The trend towards more efficient irrigation systems does not always generate water savings due to the cultivation of more water demanding crops (e.g., vegetables).
 - 2.4 Tourism activity is at its highest in summer, the same period with peak demands by irrigated agriculture, creating tensions for water resources.
 - 2.5 Municipal water use is already constrained in several Mediterranean countries exacerbated by demographic and migratory phenomena. Several northern countries have managed to reduce their municipal withdrawal while several southern and eastern countries have the opposite trend.
 - 2.6 Water-related intersectoral conflicts are likely to be exacerbated in the future because of the interactions between climate change (increasing droughts) and ongoing socio-economic and demographic trends.



3. Disastrous flash floods are frequent affecting mainly the coastal areas, where population and urban settlements are growing in flood-prone areas. These will likely become more frequent and/or intense due to climate change.
4. Climate change, in interaction with other drivers (mainly demographic and socio-economic developments including unsustainable agricultural practices), will reduce runoff and groundwater recharge, increased water requirements for crops, increase conflicts among users, and increased risk of overexploitation and degradation.
 - 4.1 Moderate global warming will reduce precipitation and with increased evaporation, leading runoff water will decline. In many regions, this will likely increase low flow periods in summer and the frequency of no-flow events will increase.
 - 4.2 At current extraction rates, overexploitation of groundwater is likely to continue having a greater impact on decreasing groundwater levels than climate change.
 - 4.3 Important challenges to groundwater quality in coastal areas are likely to arise from salt-water intrusion.
 - 4.4 The probability of more extreme and frequent meteorological, hydrological and agricultural droughts will likely increase substantially.
5. Despite an important potential for adaptation to reduce freshwater resource vulnerability, climate change exposure cannot be fully and uniformly counterbalanced. Socio-economic developments will have in many cases greater impact on water availability compared to climate-induced changes.
 - 5.1 Strategies and policies for water management and climate change adaptation are strongly interconnected with all other sectors (e.g., the water-energy-food nexus).
 - 5.2 Most adaptation and water management strategies rely on the principles of Integrated Water Resources Management (IWRM), which is based on economic efficiency, equity and environmental sustainability.
 - 5.3 Technical solutions are available to improve water availability and the efficient use of water resources.
 - 5.4 Technology is also expected to contribute significantly to the reduction of wastewater volume, its reclamation and reuse and the reduction of impacts on sea water quality.
 - 5.5 Dams for water storage or hydropower exist in most countries, and rivers are diverted for water management in some countries. Large dams often generate social and environmental impacts.
 - 5.6 The strategy of trading commodities that cannot be produced due to lacking water (virtual water trade) can be considered a form of adaptation.
 - 5.7 Most Mediterranean countries (e.g., Portugal, Spain, Italy, Greece, Israel, Turkey) have high footprints in terms of national consumption.
 - 5.8 Water demand management, i.e., methods used to save (high quality) water, may reduce water consumption or water losses.
 - 5.9 The reduction of water losses in all sectors of water use in the Mediterranean is crucial for sustainable management and adaptation strategies.

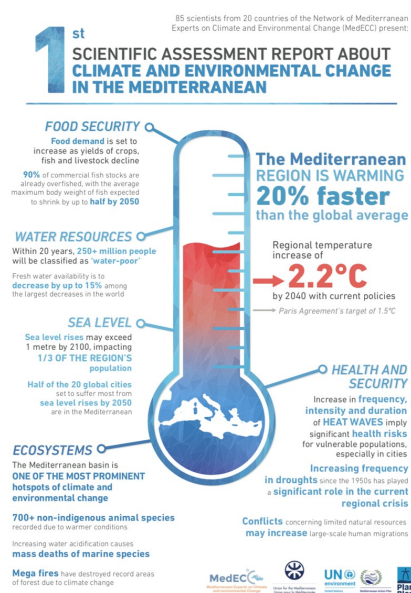


Figure 4. First scientific assessment report about climate change



The WaSec Virtual Learning Portal (VLP)

<https://vlp.wasec.net/>

by Sameer Hijazi (AQU)

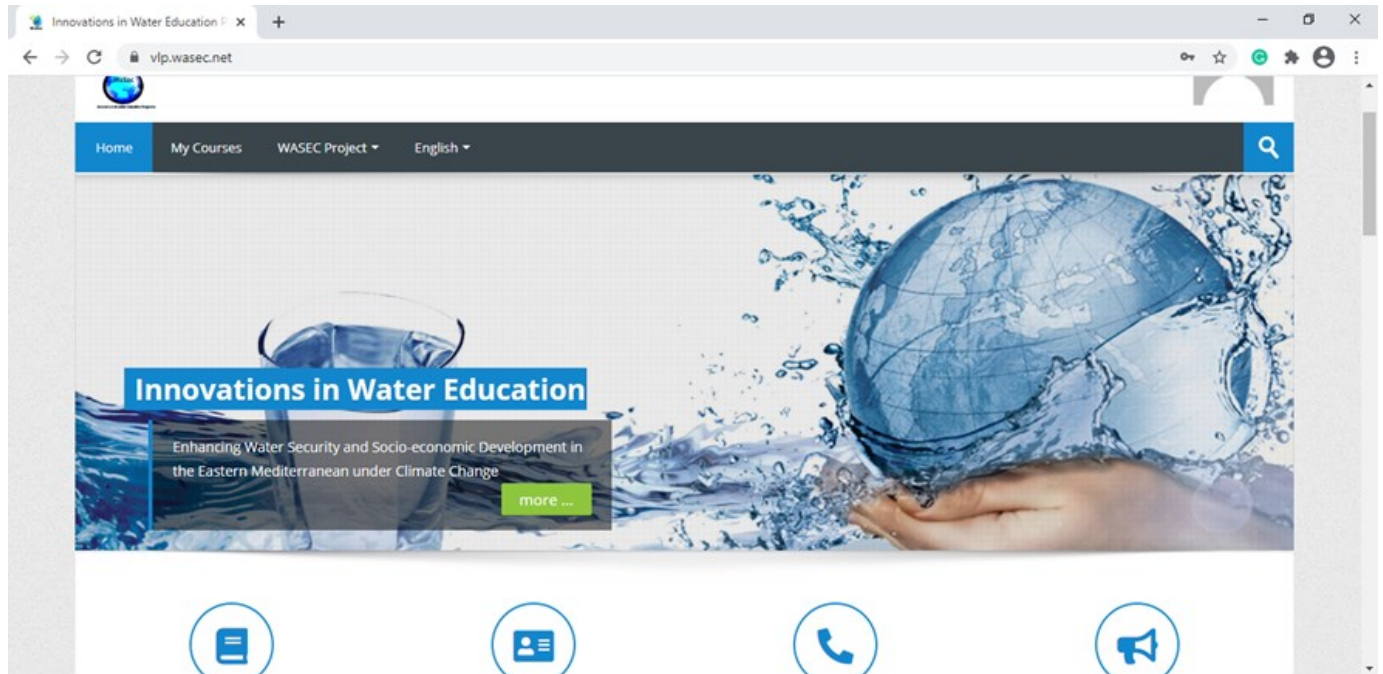


Figure 5. The main interface of the VLP

The new courses and other related material that were designed through WaSec project are available through a Virtual Learning Environment on a Virtual Learning Portal. This will allow to pilot these new courses to local & international students and teachers to further assess their utility and user-friendliness. The development of the portal is an innovation for the region and should allow the development of distance learning that could be very important for education in rural areas. The Platform and Portal allow anyone with a username and password to have access to the material as long as they have internet access. The new teaching approaches should also attract interest from enterprises, establishing the necessary cooperation's' to further make the course meet the job market's needs.

The Virtual Learning Portal contains all of the information regarding the new courses and is the main repository of the learning materials. It is able to be used simultaneously by at least 100 users and is capable of allocating roles to different type of users (lecturers, students, visitors). It also includes e-mailing abilities, discussion groups, and offers the possibility of being tailored to each courses needs and particularities. The Virtual Learning Portal will be in Arabic and English.

The objective is the implementation of these courses at all partner universities of the project. For this to be feasible supporting guidelines for their implementation were necessary. These guidelines are also be useful for new institutions that decide to adopt the courses.

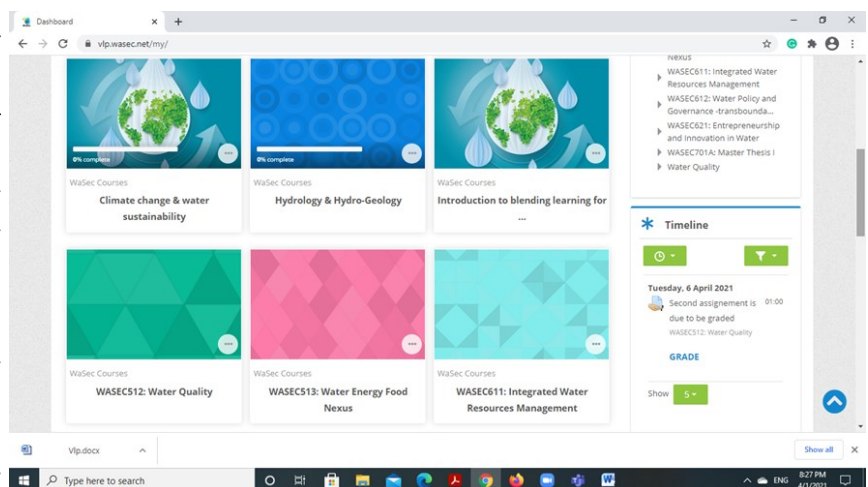


Figure 6. The different courses included in the VLP

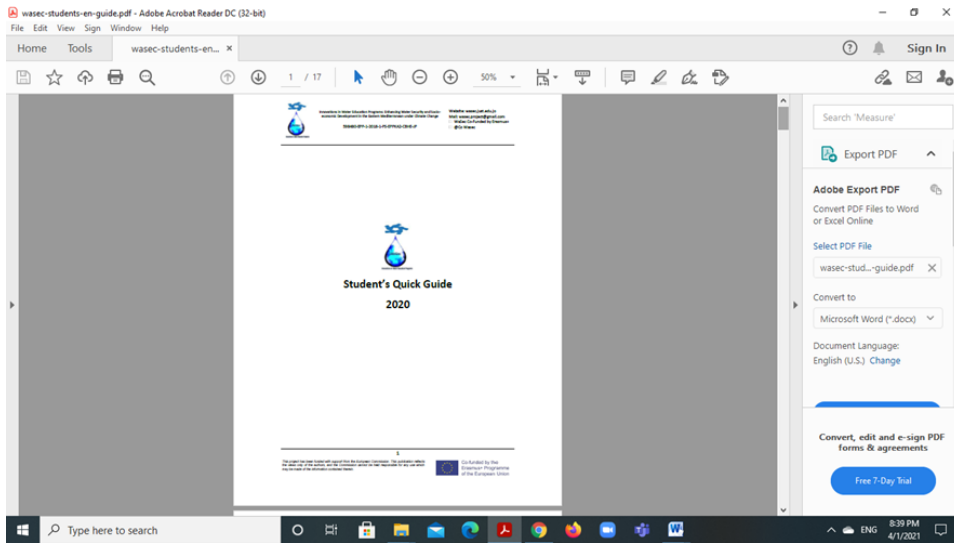


Figure 7. Student's quick guide has been developed and included in the VLP

Some of sections of the courses have been piloted in the Jordanian and Palestinian partner universities to test their effectiveness and adoptability to the culture of the region. The users participating in the piloting of the water management courses include both professionals and students. Based on these pilot runs an assessment report is being developed on the results and the best delivery of these courses in the Eastern Mediterranean and how to sustain the university enterprise cooperation.

The VLP is a web-based platform that is considered being a major tool to facilitate the Distance Learning innovation of this project. Using this VLP allows the consortium to create, use, promote & disseminate innovative technology for Teaching and Learning. The VLP supports a community of users from university partners and other consortium involved in this project, that can practice interactive online lectures and discussions, offering access to teaching and learning materials, provides communication possibilities for designing courses, discussing T&L strategies, approaches, and assessments with partners & colleagues from other countries. It will function as a virtual education environment for sharing teaching practices and experience among participants.

Its main functions are: a) The Learning Portal will provide a distance learning tool that contains learning materials, methodologies and assessments. B) Provide an e-learning and teaching environment that corresponds with 21st century educational approaches and needs. c) Multifunctional repository that contain multiple educational Water-domains that consist of modules & ILO's which allow each partner to design as needed courses or training materials. d) Create teaching communities and provide them with discussion forums. Finally, the target groups are: a) water-related teaching staff of partner universities and other involved consortium. b) Students of Partner Universities and other involved consortium.

Overall, this an innovation in the region that can enhance education in water resources management and promote sustainability and security and climate change adaptation in the region.

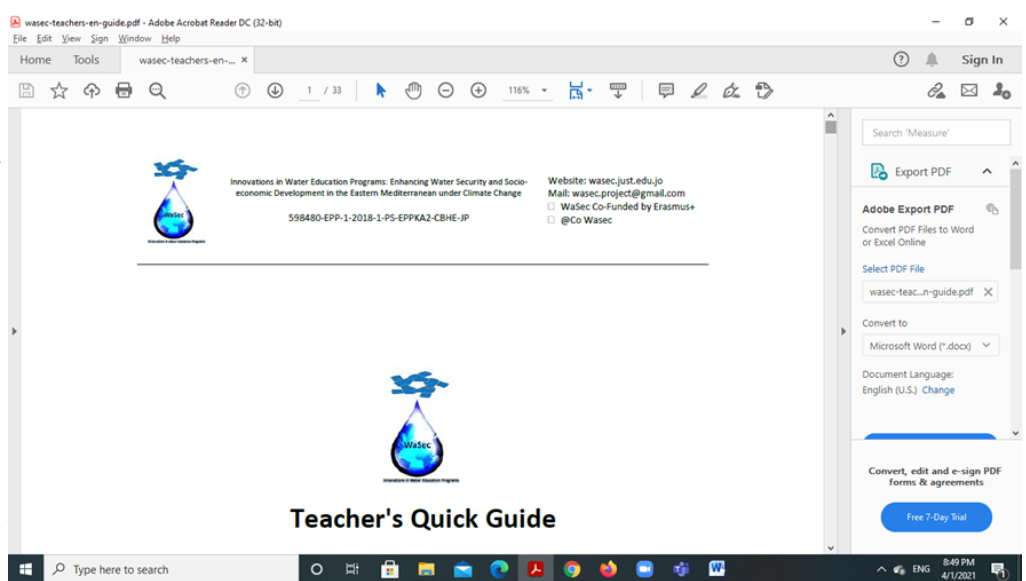


Figure 8. Teacher's quick guide has been developed and included in the VLP



Showcased WaSec Course

Entrepreneurship and Innovation in Water

By Clara Cordón Trujillo, Carmen Avilés, José L. García Rodríguez & Martín C. Giménez (UPM)

Sustainable entrepreneurship is one of the goals of the WASEC project, to cover a lack of knowledge, technologies, and entrepreneurship in the field of Water management and education, trying to get a business model based on the balance between economic performance, social justice, and conservation of the natural environment. We are facing an unprecedented situation to achieve this balance, since there is a broad consensus of agents involved in achieving the Sustainable Development Goals (SDGs). These objectives have specific goals to be achieved in 2030, to face the challenges of the 21st century.

WASEC tries to teach students about new technologies and methods, which will be incorporated into water resource management plans and eventually adopted in relevant water organizations and companies. Another important concern facing this project is the different services that water can provide, since poor management, in many cases, can generate conflicts among stakeholders, making water management a difficult task to face.

Aim of the course

As mentioned above, the course 'Entrepreneurship and Innovation in Water' aims to provide students' knowledge on topics such as the value chain of organizations related to water, the design of appropriate management strategies for the company, the elaboration and management of business plans and studies of profitability of investments in water matters, and finally the market research processes related with water. This course was designed by the Business Organization Teaching Unit at the School of Forest Engineering and Natural Resources (UPM-Madrid-Spain), and led by Prof. Carmen Avilés.

Course outline

The course is divided into three units, the first dedicated to the entrepreneurial and innovative ecosystem, the second dedicated to the analysis of opportunities and the third, which consists of the development of a business model idea by each student. Focusing on the theoretical units:

The **unit one** comprises three videos, which descriptions runs as follows:

SUSTAINABLE ENTREPRENEURSHIP

In order to promote the entrepreneurship and innovation, the first thing it must be known is the definition of entrepreneur and innovator, and how are the subtle differences between them. This unit is focused on sustainable entrepreneurship, trying to get a business model based on the balance between economic performance, social justice, and conservation of the natural environment. All this, from an ethical and responsible approach, creating conscious companies.

TOOLS FOR BUSINESS MODELS	
PESTEL	To acquire information from the external environment that influences the business model.
SWOT	Analyze and relate the external environment with the internal environment of the entrepreneurship project.
PORTER FORCES	Allow knowing the business relationship with the environment.

Figure 9. Tools to develop business models

SUSTAINABLE DEVELOPMENT GOALS

Sustainability is the most desired and sought quality by new conscious companies and new business models. It is difficult to define since it can be treated from different perspectives. Although what we can venture is that sustainability is the tool to create sustainable value.

Currently, the achievement of sustainable value is relatively simple, as we are faced with an exceptional environment for action, the Agenda 2030, and the Sustainable development Goals (SDGs). The situation is favorable for the development of sustainable entrepreneurships, since it highlights the challenges and actions that must be addressed to achieve the proposed goals for SDGs and exposes a wide range of opportunities to create business models and sustainable entrepreneurial ideas. The SDGs are an ecosystem of innovation and entrepreneurship.

FRAMEWORK FOR ENTREPRENEURSHIP

It's required to solve this question: how to develop an idea? The answer is found in the development of a business model that allows to describe the value proposition, and it is necessary to establish what strategies are going to be used for the value proposition and what are the elements that are going to be used, to carry them out.

Finally, it must be known the environment where the business model is going to be developed, using the following tools:

The **unit two** is focused on the terms related to the creativity and innovation in terms of entrepreneurship, in the framework of water challenges, and is delivered in four videos regarding business plan, canvas and creativity:

CREATIVITY, HOW TO GENERATE IDEAS?

Creativity is an innate ability in all people and is the basis for innovation and the generation of ideas. To encourage the creation of ideas it is necessary to be clear about the following guidelines: Open Mind, Copy (but not copying in any way, it applies an improvement and always from legality and ethics), Listening, tangible or intangible products, and creation of culture of innovation.

CREATIVITY. CREATIVE PROCESS

After generating the idea, the creative process is as follows: Generate ideas, From ideas to opportunities, From opportunities to projects, From projects to prototypes, Implementation, Evaluation.

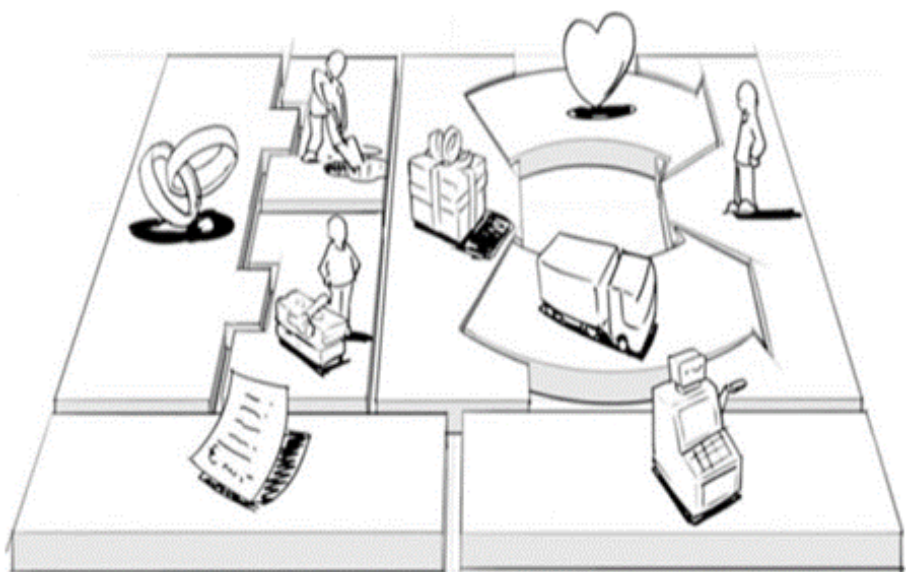


Figure 10. Canvas method

CANVAS

One way to visualize a business plan is through the CANVAS Model. This model encourages strategic innovation and consists of creating a "CANVAS" to design businesses. Its objective is to graphically identify, on the one hand, all the resources and activities entrepreneur need to develop the idea and, on the other hand, the customers and the distribution of the product or service. All this information allows the identification of the costs and income of the project.



BUSINESS PLAN

The last part of the process is to shape the idea, give structure to it, and turn it into an entrepreneurial project. For this, the entrepreneur needs to develop a business plan that allows to know which is the potential market, which are the interest groups or the material, and the needed human resources. In short, to have all the relevant information to develop a business plan.

The teaching material is available mainly in digital format. There are video-lectures in Spanish language with English translation available therein.

UNIT 1: ENTREPRENEURIAL AND INNOVATIVE ECOSYSTEM	UNIT 2: OPPORTUNITY ANALYSIS	UNIT 3: PREPARE YOUR OWN IDEA
VIDEO 1: Unit 1.1. Sustainable entrepreneurship	VIDEO 1: Unit 2.1. Creativity	
VIDEO 2: Unit 1.2. Sustainable Development Goals	VIDEO 2: Unit 2.1. Part ii. Creativity. Creative process	
VIDEO 3: Unit 1.3. Framework for entrepreneurship	VIDEO 3: Unit 2.2. Canvas	
	VIDEO 4: Unit 2.3. Business plan	

Figure 11. Entrepreneurship course design

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The purpose of WaSec “is to bring together and strengthen the cooperation between companies and HEIs through the development of courses in Water Resources Management, while taking into consideration potential climate change impacts, with adaptive learning and teaching methods”.

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