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TALENT IN BIODIVERSITY

Report on:

i) E-learning Best Practices on Taxonomy and Biodiversity

ii) Employment and skills for Biodiversity and STEM jobs in general

BELGIUM	Royal Belgian Institute of Natural Sciences (RBINS)
BELGIUM	Consortium of European Taxonomic Facilities (CETAF)
PORTUGAL	Edufor Training Center (EduFor)
HUNGARY	Hungarian Natural History Museum (HNHM)
GREECE	University of Crete (UOC)
GREECE	Natural History Museum of Crete – University of Crete (NHMC-UOC)

BELGIUM
PORTUGAL
HUNGARY
GREECE

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BELGIUM	Consortium of European Taxonomic Facilities (CETAF)

This booklet has been prepared in the frames of the BIOTALENT project
http://biotalent.myspecies.info/

It is a report on national research conducted in all four project countries, in order to identify:
i) existing e-learning training seminars related to Taxonomy and Biodiversity, in connection with the labor market and
ii) skills of job seekers, necessary for the Biodiversity and STEM (Science, Technology, Engineering and Mathematics) labor market.

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museum NATURALSCIENCES.BE

CETAF

eduFor

Hungarian Natural History Museum

Natural History Museum of Crete

University of Crete

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Sideritis syriaca ssp. *syriaca* ©NHMC

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TALENT IN BIODIVERSITY

i) E-learning Best Practices on Taxonomy and Biodiversity

Hyla arborea ©NHMC

INTRODUCTION

E-learning in Europe

E-learning is *"learning that is supported by information and communication technologies (ICT). E-learning is, therefore, not limited to "digital literacy", but may encompass multiple formats and hybrid methodologies, in particular, the use of software, Internet, CD-ROM, online learning or any other electronic or interactive media*." [Cedefop (European Centre for the Development of Vocational Training), 2000].

During the last 15 years, e-learning has changed education and training radically, opened new ways of teaching and increased the ability of people to acquire new skills. Its development has been important for governments looking to widen access to education and training and to increase the qualifications of those entering the labour market and for companies seeking new business opportunities or to maintain or strengthen their competitiveness through continuously improving productivity (Cedefop Reference series; 26, 2001).

Many e-learning programs have being implemented via user-friendly softwares (educational platforms) adjusted to the Distance Learning Principles. The educational platform is a portal through which the electronic classrooms are being managed and through which the users can have access in them. Essential assets to e-learning have been credentials, flexibility of the course program to better fit the needs and profile of the learner, and extensive use of ICT. The courses and modules often engage adult learners with studies in function of future employment, so many tackle subjects such as computer programming, management, languages, construction, nutrition etc. – all topics of great value in a professional context.

Cistus creticus ©NHMC

E-courses on biodiversity and climate change

Searching for innovative e-courses on biodiversity and climate change in the BIO-TALENT partners' countries, very few related e-courses were found, revealing a considerable gap concerning the above topics within European online studies. The dominant suppliers of such courses seem to be Universities and Centres of Vocational Training. However, most of the platforms used and labeled as e-learning platforms are often interfaces supporting real face-to-face courses at higher education institutes. Many of these platforms rather provide links to online information, downloadable documents, self-tests etc. than function as online learning scenes.

Another important issue for e-courses is obtaining credentials, which requires long-term commitment and considerable financial leverage. Those courses, offered either in the form of graduate or postgraduate programs by Universities, or as seminars by vocational institutions, require long-term commitment, regular study, team work and fixed weekly seminars. This might scare off adult learners who feel uncomfortable with, or are unable to complete a full academic program.

Looking for these topics outside of an academic context, it was seen that the topics of biodiversity and climate change were very few, offered by institutions offering related subject matter such as ecology, gardening, sustainability or environmental policy and management. These courses are less costly, but at the same time they lack convincing credentials and seem to offer only a limited "virtual" experience, with few online tools, resources or tutorials.

As a conclusion, there is a considerate potential for a short-term, innovative and multilingual e-learning course on biodiversity and climate change for an adult audience. This is provided that sufficient effort is put into designing an elaborate virtual learning experience, a credible and useful certificate is awarded upon completion, and sufficient attention is spent on the learner's individual needs.

Concerning the E-Learning Best Practices in Portugal, the research of our Portuguese partners has not revealed any significant data, relevant to this analysis.

Anthemis chia ©NHMC

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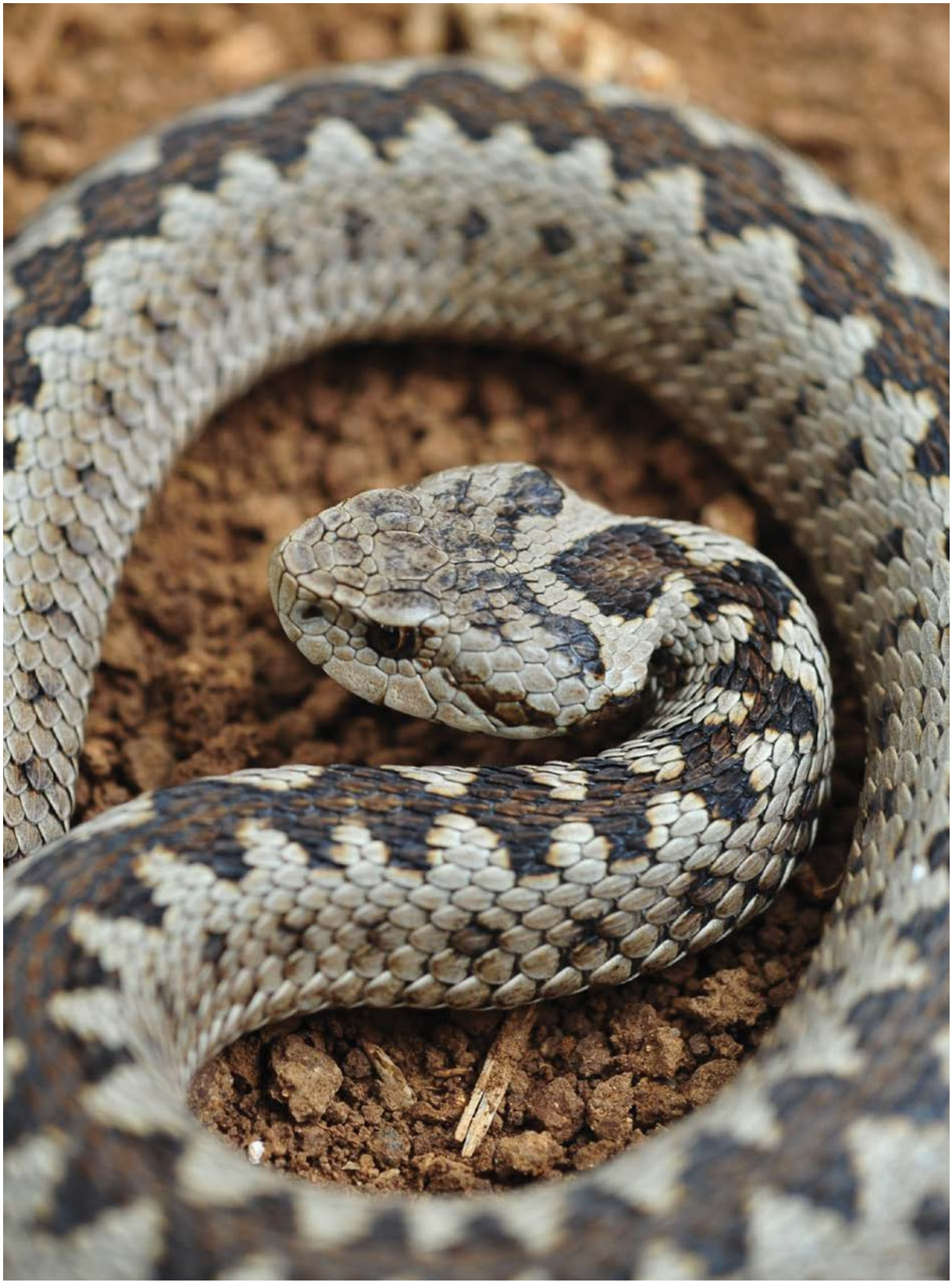
E-learning: Best Practices for Belgium



Vipera ursinii ©NHMC

E-learning: Best Practices for Belgium

Contribution from Partner:	RBINS
Reporting to:	Activity Pole 'Quality Assurance and Validation' – NHMC UoC
Delivery date:	30 January 2017
Reporter:	Tine Geunis

The virtual learning experience in Belgium seems to have developed considerably during the last decade. The Belgian portal for e-learning describes online study as largely or completely 'distant' from the organising institution, while still allowing for (virtual) individual or group tutoring (BFO 2017). Essential assets to e-learning according to the Belgians are credentials in some shape or form, flexibility of the course program to better fit the needs and profile of the (adult) learner, and extensive use of modern communication and information technologies.

The portal lists several regional governmental institutions concerned with the organisation of distance (adult) learning in both Flanders and Wallonia, Belgian's Dutch speaking and French speaking regions respectively. A link to e-courses organised by academic institutions is also provided. The courses and modules on offer engage adult learners mainly with study in function of (future) employment or enjoyment, while a proportion of e-courses also specifically addresses young dropouts. Many e-courses and modules therefore tackle subjects such as computer programming, management, languages, construction, nutrition etc. – all topics of great value in a professional context.

E-courses on biodiversity and climate change in Belgium

Scanning the Belgian educational landscape for innovative e-courses on biodiversity and climate change (cc) then, has provided us with three important insights. Firstly, we have come up with only 6 biodiversity/cc-related e-courses, revealing a considerable 'gap' concerning the above topics within the Belgian field of online study. By far the dominant supplier of e-courses offered are universities, with the Dutch 'Open Universiteit' having the widest range of modules and e-courses.

Secondly, obtaining credentials for most of these e-courses requires long-term commitment and considerable financial leverage, as they are offered in the form of a graduate program. Less costly are the e-courses offered by Belgian vocational institutions, but here too, long-term commitment is key, as well as an appetite for regular study, team work and fixed weekly seminars. This might scare off adult learners who feel uncomfortable with, or are unable to complete a full academic program.

Looking for these topics outside of an academic context, it was seen that the topics of biodiversity and cc were stretched thinner, with only a handful of (smaller) institutions offering related subject matter such as ecology, gardening or sustainability. Less costly, these courses however rather lack convincing credentials and seem to offer only a limited 'virtual' experience, with few online tools, resources or tutorials.

Finally, it would seem that the current offer of e-courses on biodiversity and cc favours Dutch speaking learners, as 4 out of 6 e-courses found are offered in Dutch only. Put together, these three insights allow us to recognise a considerate potential for a short-term, innovative and multilingual e-learning course on biodiversity and climate change for a Belgian adult audience. This is provided that sufficient effort is put into designing an elaborate virtual learning experience, a credible and useful certificate is awarded upon completion, and sufficient attention is spent on the learner's individual needs.

Source:

Belgische Federale Overheidsdiensten 2017 [Online]. Afstandonderwijs. [http://www.belgium.be/nl/Leren/permanente_vorming/afstandsonderwijs]

PRACTICE BE 01 – Vrije Universiteit Brussel (VUB) / OpenUped.eu

TITLE/ABBREVIATION of the e-learning course/ seminar	The Lived Experience of Climate Change
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Fully online without facilitators
Providing Institution/ Organisation/editor	Lech-e/OpenUped
Access (free, in charge)	Free
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	EFQ-level 1

Duration in hours	325 hrs
Certificate/Diploma (ECTS credits)	EU qualifications network EFQ level 1
Technical requirements	(Access to) computer + internet connection
Web address/ link	http://www.leche.open.ac.uk/
Users/ target group	EU postgraduates
Language of the e-learning course/ seminar	English
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	Self-study
Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	The project has developed postgraduate online learning resources and virtual learning communities on the lived experience of climate change -- how individuals and groups experience its local impacts, such as extreme weather or biodiversity changes.
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	virtual mobility platform, including participation in a learning community with practitioners from Europe and beyond
Accessible open content systems or accessible closed content systems	Alleged open content system since May 2012

Other comments (e.x. public data on user ratings of the course/ seminar)	The project experience has led to the LECHe team guest-editing a special issue of the International Journal of Innovation and Sustainable Development: 'From disciplinarity to interdisciplinarity and beyond in higher education on climate change'. The special issue contains seven papers authored by the partners. The provisional key findings of the project are: • Networked curriculum involving diverse Universities and disciplines can be very innovative. • Virtual mobility has distinct advantages when it is not tied to bilateral arrangements and is linked to key competences. • The lived experience of climate change is an important concept, account of which should be taken when communicating and formulating climate change policy.

Findings and conclusions

This project is highly similar to BIOTALENT (EU oriented, focus on CC and biodiversity, free admittance, etc.). However, while useful for postgrad EU students, this course seems rather inaccessible for non-students. It would also seem that, despite being EFQ level 1, the level of study is already quite high, making it even less accessible for a lay audience. Interesting perspective on CC though, and the cross-university approach seems to fit well with the theme. It is unclear whether the course is effectively accessible since 2012. There are no recent postings on the website.

PRACTICE BE 02 - Vives

TITLE/ABBREVIATION of the e-learning course/ seminar	Bachelor in de agro- en biotechnologie, green management
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Mostly online in combination with practical lectures organised on Fridays, as well as internships with partner companies. All students are attributed a tutor, too.
Providing Institution/ Organisation/editor	Vives (vocational education)
Access (free, in charge)	Prices range between € 102 (subsidised students) and € 890 (non-subsidised students) + course fees
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	Upon completion, students will receive a Bachelor's degree (vocational education)
Duration in hours	Model trajectory is 4 years
Certificate/Diploma (ECTS credits)	Bachelor's degree
Technical requirements	(Access too) computer + internet connection, transport to and from internships/practical lectures
Web address/ link	https://www.vives.be/opleidingen/biotechniek/groenmanagement#distance
Users/ target group	Anyone with a high school diploma and sufficient knowledge of Dutch
Language of the e-learning course/ seminar	Dutch

Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	Continuous
Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Fridays include practical seminars, it would seem this is organised on a weekly basis
Brief description, tasks	'Green management' includes learning about plant species/ care, interrelations within ecosystems, learning how to operate garden gear, learning how to insert graphical designs in specialised computer programs, etc..
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	Course books and an online learning platform (Toledo) that includes video material, practice assignments, student forums, etc.. + practical lectures on Fridays
Accessible open content systems or accessible closed content systems	Closed content
Other comments (e.x. public data on user ratings of the course/seminar)	

Findings and conclusions

This course is obviously intended for people that are willing to engage into a long term educational project. It is an official vocational program that aims to prepare its students for more practical, outdoors jobs where biodiversity plays a crucial role. I do not believe this course would be direct competition for BIOTALENT within the Belgian market. Instead, the BIOTALENT project would probably add to the credibility of graduated students, and would assist them into building a stronger theoretical framework concerning climate change mainly, as well as increasing their knowledge of the fauna and flora that is encompassed within these EU ecosystems they learn to manage and protect. Perhaps we should get in touch with the organiser of this course?

PRACTICE BE 03 – De Open Universiteit

TITLE/ABBREVIATION of the e-learning course/ seminar	BSc Environmental – Natural Sciences
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Mostly online, with 4 annual organised theme days
Providing Institution/ Organisation/editor	Open Universiteit
Access (free, in charge)	Charges – between € 160 and € 840 per module
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	Worldwide
Duration in hours	2 yrs – 4 yrs
Certificate/Diploma (ECTS credits)	BSc
Technical requirements	(Access to) computer + internet connection
Web address/ link	https://www.ou.nl/web/open-universiteit/-/BMW_Bachelor-Milieu-natuurwetenschappen-BSc
Users/ target group	Anyone with a high school diploma aspiring to obtain a(nother) BSc

Language of the e-learning course/ seminar	Dutch
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	Continuous
Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	Basic knowledge on natural and environmental sciences, with practical assignments to increase skills in scientific approach to solving environmental problems (hypothesis development, investigative skills, interventional skills, etc.)
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	Digital learning environment
Accessible open content systems or accessible closed content systems	Closed content system
Other comments (e.x. public data on user ratings of the course/ seminar)	De Open Universiteit is a Dutch institution but cooperates with the 6 Belgian universities to offer distance learning courses and programs to Belgian students

Findings and conclusions

This is yet another example of a long term educational engagement for aspiring students. As such, it is most definitely no direct competition for the BIOTALENT project, not in the least because the BSc has a high entrance fee. However, it is also possible to study separate modules of this course and acquire international credits for it. I feel that we must emphasize our focus on the two case studies – the unusual and narrow focus is what makes BIOTALENT unique, attractive and most of all different from modules and courses offered via institutions such as these. A glance through their study material makes me suspect that their study material remains rather superficial.

PRACTICE BE 04 - Laudius

TITLE/ABBREVIATION of the e-learning course/ seminar	Ecologie basiskennis (ecology basic knowledge)
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Either fully online or fully at home, every student is assigned a tutor
Providing Institution/ Organisation/editor	Laudius
Access (free, in charge)	€ 149 online version, € 179 physical course material
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	Regional
Duration in hours	7 months on average
Certificate/Diploma (ECTS credits)	Certificate recognised by Flemish government
Technical requirements	Pen & Paper, or (access to) computer + internet connection
Web address/link	http://www.laudius.be/persoonlijke-ontwikkeling/dieren-planten/singleview/cursussen/basiskennis-ecologie-1.html
Users/ target group	Anyone interested in the environment/ecology. No previous degrees or diplomas needed
Language of the e-learning course/ seminar	Dutch

Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	Continuous
Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	Tasks on classification, ecosystem products and interrelations, symbioses + final exam
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	None that are apparent or advertised
Accessible open content systems or accessible closed content systems	Closed content systems
Other comments (e.x. public data on user ratings of the course/ seminar)	

Findings and conclusions

This is basically a very dry online course *avant la garde* – mostly textual course material, with exercises to test theoretical and practical acquisition of the student. BIOTALENT will most definitely be very different, however I feel that this course might be popular among an older audience – less advanced but also more accessible to a technologically (less) (il) literate audience. Perhaps something to consider when developing BIOTALENT further: how to attract those less comfortable within a virtual environment?

PRACTICE BE 05 – Artevelde Hogeschool

TITLE/ABBREVIATION of the e-learning course/ seminar	Secondary Teacher training Biology
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Partially online, with at least 5 weekly contact hours that include seminars
Providing Institution/ Organisation/editor	Artevelde Hogeschool
Access (free, in charge)	€ 435, spread over 3 yrs
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	National
Duration in hours	Dependent on learner, max 4 yrs
Certificate/Diploma (ECTS credits)	Bachelor's degree
Technical requirements	(access to) computer + internet connection
Web address/ link	https://www.arteveldehogeschool.be/opleidingen/bachelor/leraar-secundair-onderwijs/biologie
Users/ target group	Anyone with a high school diploma
Language of the e-learning course/ seminar	Dutch
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	Continuous

Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	Acquiring scientific and mathematical insights through means of didactic material (module handbooks, dissections, practical assignments, tests, etc..)
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	Online: seemingly none Seminars: many (dissection, physics and chemistry tests)
Accessible open content systems or accessible closed content systems	closed
Other comments (e.x. public data on user ratings of the course/ seminar)	

Findings and conclusions

This is another example of a longer educational program, but this one seems to aim specifically at working parents/ mature students that are already employed. It seems to balance out online-offline offer quite well, and implies to offer a high degree of flexibility to the learner. It is also significantly cheaper than the other universities/educational institutions that offer courses in Belgium. However, again the courses seem quite general and only a few courses dig deeper into the environmental/biodiversity issues. Overall, I don't think this course will attract the learner profiles that BIOTALENT is aiming for (short term, extra-training, etc.).

Lavandula stoechas ©NHMC

PRACTICE BE 06 - EDX

TITLE/ABBREVIATION of the e-learning course/ seminar	Ressources naturelles et développement durable (natural resources and sustainable development)
TYPE of e-learning course/seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Fully online with course instructor
Providing Institution/ Organisation/editor	EDX, an open-source platform
Access (free, in charge)	Free, adding a certificate is optional for an extra $ 50
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	Unclear, certification is provided by EDX and is implied to be recognised globally
Duration in hours	4-6hrs a week for 8 weeks
Certificate/Diploma (ECTS credits)	an instructor-signed certificate with the institution's logo at request and for an extra fee
Technical requirements	(access to) a computer + internet connection
Web address/ link	https://www.edx.org/course/ressources-naturelles-et-developpement-louvainx-louv4x-1#!
Users/ target group	Anyone with an interest in the topic, no prior knowledge or diploma/degree needed
Language of the e-learning course/ seminar	French
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	continuous

Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	continuous
Brief description, tasks	Understanding and using scientific models to tackle specific challenges within the field of natural resource exploitation and sustainable development
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	videos
Accessible open content systems or accessible closed content systems	Enrolment is mandatory
Other comments (e.x. public data on user ratings of the course/ seminar)	

Findings and conclusions

This open-source platform certainly seems to apply a modern and fresh approach to online study – there are many mentions of professional benefits, references to social and professional online network, emphases on the limited amount of study, … As such, it is assumed that this course will certainly appeal to a young(er), audience interested to boost its social/professional network. However, the description remains rather vague, so it is unclear to what extent to course actually contributes to developing a thorough understanding of sustainable development with the learner in 8 weeks. Question is: is this necessary? Are potential future employers content with the effort put in by the learner and/or by the certificate with the logo? These are interesting questions to consider when further developing BIOTALENT as well – allowing more room for appeal might attract a younger, ambitious audience, but could cause the credibility/content to suffer.

Anthemis rigida ©NHMC

Natrix natrix ©NHMC

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TALENT IN BIODIVERSITY

E-learning: Best Practices for Hungary

Crocus sieberi ssp. *sieberi* ©NHMC

E-learning: Best Practices for Hungary

Contribution from Partner:	HNHM
Reporting to:	Activity Pole 'Quality Assurance and Validation' – NHMC UoC
Delivery date:	30 January 2017
Reporter:	Gergely Babocsay

In the field of biodiversity and climate change or in any remotely related field we found no real e-learning course running in Hungary. Most of the platforms used and labeled as e-learning platforms are in fact interfaces supporting real face-to-face courses at higher education institutes. The task of these platforms is rather to provide links to online information, downloadable documents, self-tests etc. than to function as online learning scenes. In addition, these platforms were only remotely related to the topics in scope: they are platforms supporting the teaching of botany, plant ecology and plant physiology.

Source: www.szie.hu, www.unideb.hu

Anguis fragilis ©NHMC

PRACTICE HU 01 - Szent István University, Gödöllő, wwe.szie.hu

TITLE/ABBREVIATION of the e-learning course/ seminar	Plant ecology
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Basically an online evaluation (test) platform
Providing Institution/ Organisation/editor	Hungarian Academy of Sciences – Szent István University, Gödöllő,
Access (free, in charge)	For students of SZIU. Free of charge.
Recognition of the e-learning course/seminar (worldwide, European, national, local)	None. It is itself an evaluation platform.
Duration in hours	Voluntary
Certificate/Diploma (ECTS credits)	None. The face to face course it supports is credited as a normal university course if a student is enrolled in any of the BSc or MSc programme of the SZIU that requires this course.
Technical requirements	Internet connection
Web address/link	http://elearning.szie.hu/course/search.php?search=mk-k&perpage=all
Users/ target group	BSc students, biology
Language of the e-learning course/seminar	Hungarian
Frequency of the e-learning course/seminar: (annual, continuous, regular, specific, only W/E)	continuous

Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	continuous
Brief description, tasks	It is only an evaluation (test) platform.
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	
Accessible open content systems or accessible closed content systems	accessible closed content systems
Other comments (e.x. public data on user ratings of the course/seminar)	

Findings and conclusions

This is not a real course, it is rather an online support platform designed to provide electronic learning material (pdfs, links etc.) other than what presented on the face-to-face courses. It also serves as an information forum for students.

PRACTICE HU 02 – Szent István University, www.szie.hu

TITLE/ABBREVIATION of the e-learning course/ seminar	Botany
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Not a full e-learning course, it is rather a support platform for a face to face course. Some online practicing is possible through the platform, but it is more a collection of support material.
Providing Institution/ Organisation/editor	Department of Botany, Szent István University, Gödöllő, Hungary

Access (free, in charge)	For students of SZIU
Recognition of the e-learning course/seminar (worldwide, European, national, local)	None. Only support for a face to face regular university course.
Duration in hours	Voluntary
Certificate/Diploma (ECTS credits)	None
Technical requirements	Internet connection
Web address/link	http://elearning.szie.hu/course/search.php?search=mkk&perpage=all
Users/ target group	BSc students, biology
Language of the e-learning course/seminar	Hungarian
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	continuous
Day time of the e-learning course/seminar sessions (morning, afternoon, continuous	continuous
Brief description, tasks	Not a full e-learning course, it is more a support platform for a face to face course. Some online practicing is possible through the platform, but it is more a collection of support material.
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	PDFs, Links
Accessible open content systems or accessible closed content systems	accessible closed content systems

Other comments (e.x. public data on user ratings of the course/seminar)	

Findings and conclusions

This is not a real course, it is rather an online support platform designed to provide electronic learning material (ppts, pdfs, links etc.) other than what presented on the face-to-face courses. It also serves as an information forum for students.

PRACTICE HU 03 – University of Debrecen, www.unideb.hu

TITLE/ABBREVIATION of the e-learning course/ seminar	Plant physiology
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Not a full e-learning course, it is rather a support platform for a face to face course. Some online practicing is possible through the platform, but it is more a collection of support material.
Providing Institution/ Organisation/editor	University of Debrecen, Debrecen Hungary
Access (free, in charge)	For students of UNIDEB
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	
Duration in hours	
Certificate/Diploma (ECTS credits)	none
Technical requirements	Internet connection

Web address/link	https://elearning.unideb.hu/course/index.php?categoryid=18
Users/target group	BSc students, biology
Language of the e-learning course/ seminar	Hungarian
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	
Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	
Brief description, tasks	
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	pdfs, ppts, links
Accessible open content systems or accessible closed content systems	closed content systems
Other comments (e.x. public data on user ratings of the course/ seminar)	

Findings and conclusions

This is not a real course, it is more an online support platform designed to provide electronic learning material (pdfs, links etc.) other than what presented on the face-to-face courses. It also serves as an information forum for students.

Natrix natrix ©NHMC

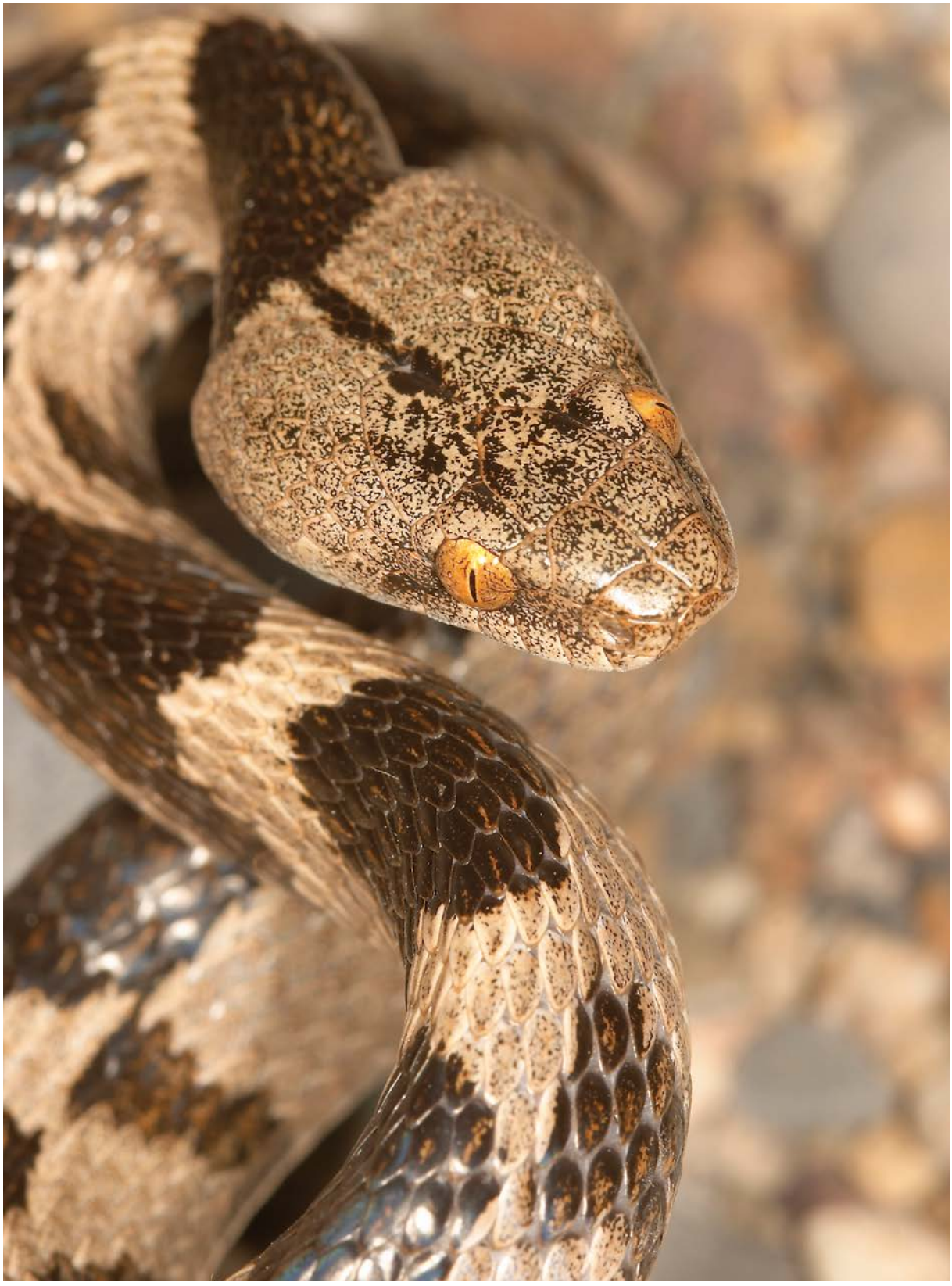
Ophrys candica var. *minoa* ©NHMC

Bufo bufo ©NHMC

Satureja thymbra ©NHMC

biotalent
TALENT IN BIODIVERSITY

E-learning: Best Practices for Greece



Telescopus fallax ©NHMC

E-learning: Best Practices for Greece

Contribution from Partner:	NHMC UoC
Reporting to:	Activity Pole 'Quality Assurance and Validation' – NHMC OUC
Delivery date:	30 January 2017
Reporter:	Iasmi Stathi

Although, in Greece, generally, there are many e-learning courses available, in the fields of biodiversity and climate change or other remotely related field, only a few have been found. Most e-learning platforms are hosted by Greek Universities, or support face-to-face courses at higher education institutes. At the same time, most of the courses are not free of charge.

Salvia pomifera ©NHMC

PRACTICE GR 01 – Hellenic Open University

TITLE/ABBREVIATION of the e-learning course/ seminar	Studies in Natural Sciences
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Fully online with facilitators
Providing Institution/ Organisation/editor	Hellenic Open University
Access (free, in charge)	In charge
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	European
Duration in hours	4 years
Certificate/Diploma (ECTS credits)	Bachelor's degree 240 ECTS credits Classification according to ISCED-2011 of Unesco: based on the level of Education: 6 based on the field of Education: 44 Physical Sciences Classification according to ISCED-2013 of Unesco: based on the field of Education: 0538 Physical Sciences
Technical requirements	(Access to) computer + internet connection
Web address/link	https://www.eap.gr/en/
Users/ target group	Anyone with a high school diploma
Language of the e-learning course/ seminar	English/Greek

Hemidactylus turcicus ©NHMC

Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	Continuous
Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	The course aims to provide students with an introduction to all fields of Natural Science, including Physics, Chemistry and Biology, understanding of Science principles, notions and theories, and to develop problem solving abilities.
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	virtual mobility platform, virtual labs, videos, pdfs, ppts, virtual library, etc.
Accessible open content systems or accessible closed content systems	closed content

Other comments (e.x. public data on user ratings of the course/ seminar)	**Learning Outcomes** On successful completion, among others, the students will also be able to: • Understand and describe the necessity and concepts of basic scientific directions within the framework of a consolidated scientific world perception • Describe the basic principles, concepts, scientific theories and laws of Physics, Chemistry and Biology, as well as their evolution, till today. • Apply analytical and approximation techniques and methods for solving problems modelled through differential equations that describe physical phenomena and/or biological and chemical processes. • They also will be able to describe heredity principles and interpretation of the complex biological relationship between genotype and phenotype, which have influenced the evolution on earth through the process of natural selection. • Deepen the knowledge of laboratory methods and techniques that are employed for the collection, analysis and process of biological, chemical and physical data, and develop the relevant skills.

Findings and conclusions

This is a long term educational engagement for students on Natural Sciences, with no direct competition for the BIOTALENT project, since the specific BSc has a high entrance fee, and does not focus directly to taxonomy, biodiversity and climate change.

PRACTICE GR 02 –E learning University of Athens_ 1

TITLE/ABBREVIATION of the e-learning course/ seminar	Process and Organization of Production of Medicinal and Aromatic Plants (Διαδικασία και Οργάνωση της Παραγωγής Φαρμακευτικών και Αρωματικών Φυτών)
TYPE of e-learning course/seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Fully online with facilitators

Providing Institution/ Organisation/editor	Vocational Training Center of the National and Kapodistrian University of Athens
Access (free, in charge)	In charge (660-700 Euros)
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	local
Duration in hours	100
Certificate/Diploma (ECTS credits)	Certificate of attendance
Technical requirements	(Access to) computer + internet connection
Web address/link	https://elearn.elke.uoa.gr/show_programs.php?catID=all&prID=461
Users/ target group	Agronomists graduates, graduated young farmers, organic farmers, prospective professionals on organic farming, environmentalists, geologists, foresters, researchers, geo-technicians, graduate students of the broader industry of agriculture, business consultants, investment advisors, graduates of Institutes of Vocational Training and technical schools related sectors, managers of companies or/and beverage, food or cosmetics industries and everyone interested in all aspects of Organic Agriculture, not only as a business venture, but for information as well.
Language of the e-learning course/ seminar	Greek
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	5 months
Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous

Brief description, tasks	The program aims at a) the full understanding of the immense perspective in Contemporary Organic Farming, describing several alternative proposals for cultivation, processing and packaging, and b) a sophisticated model of farmer (farmer-entrepreneur) and a constantly evolving scientist (agriculture consultant).
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	virtual mobility platform, videos, pdfs, ppts, etc.
Accessible open content systems or accessible closed content systems	closed content
Other comments (e.x. public data on user ratings of the course/ seminar)	In this program the following cultures are described: pear, aloe vera, Goji-berry, bilberry, stevia, sea buckthorn and pomegranate from their first installation in the field up to the stage of processing and promoting them in the market. Medicinal-Aromatic Plants are also described: thyme, oregano, lavender, mint, basil, savory, marigold, rosemary, hyssop, siderite, chamomile, peppermint, etc. It is a diverse and widely applicable group of plants, appreciated for centuries for their multiple uses and properties. In recent years, they have been cultivated in our country more intensively by new farmers, because of their high profit (especially when the product is processed) in relation to the costs required for their cultivation. A third alternative crop category, as important as the previous two, is also described, the so-called subtropical plants, like avocado, banana, dates, pecans, persimmon and mango.

Findings and conclusions

All the courses provided by the Vocational Training Center of the National and Kapodistrian University of Athens are being implemented via **a user-friendly software** (educational platform) adjusted to the Distance Learning Principles. The educational platform on use is a portal through which the electronic classrooms are being managed and through which the users can have access in them.

In parallel, there is provided **full educational support** since the trainee can address his appointed tutor electronically, through an integrated in the platform online communication system, in case he has lesson and test related questions. Through the communication system, the trainee can also address the Secretariat or the Technical Support services.

There is also provided access to a specially configured electronic library, from which the trainee can **download and print** all the related to the program e-books, as well as additional support educational material for his papers and tests.

Finally, the VTC of the National and Kapodistrian University of Athens has been accredited from the **National Organisation for the Certification of Qualifications and Vocational Guidance** (**EOPPEP**) (http://www.eoppep.gr/index.php/en/), so it provides qualified and certified studies.

The specific course, however, (*Process and Organization of Production of Medicinal and Aromatic Plants*) could not function as competitive with BIOTALENT courses, since a) it is not free of charge and b) it does not cover the thematology of BIOTALENT.

PRACTICE GR 03 – E learning University of Athens_ 2

TITLE/ABBREVIATION of the e-learning course/ seminar	Environment-Culture: Contemporary Theories and Practices on the Direction of Sustainability (**Περιβάλλον-Πολιτισμός: Σύγχρονες Θεωρίες και Πρακτικές στην Κατεύθυνση της Αειφορίας**)
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Fully online with facilitators
Providing Institution/ Organisation/editor	Vocational Training Center of the National and Kapodistrian University of Athens
Access (free, in charge)	In charge (570-600 Euros)
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	local
Duration in hours	60

Certificate/Diploma (ECTS credits)	Certificate of attendance ECVET: 5
Technical requirements	(Access to) computer + internet connection
Web address/ link	https://elearn.elke.uoa.gr/show_programs.php?catID=all&prID=478
Users/ target group	Graduates of Universities or/and Technological Education Institutes of Greece or Europe and secondary school graduates with relevant professional experience
Language of the e-learning course/ seminar	Greek/English
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	4 months
Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	In this program, the student a) will be informed about basic concepts and theories related to the environment and culture and b) will become familiar with ways that promote social empowerment involving wider groups of society as a cultural capital in the direction of sustainability, through the presentation of concrete examples of modern practice management of natural and cultural heritage.
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	virtual mobility platform, videos, pdfs, ppts, etc.
Accessible open content systems or accessible closed content systems	closed content

Other comments (e.x. public data on user ratings of the course/ seminar)	The program is addressed to sensitized and socialized modern citizens, who care about the environment and culture, and look for ways to support cultural development, through cultural creation.

Findings and conclusions

As every course provided by the Vocational Training Center of the National and Kapodistrian University of Athens, this one is both of high standards and under European certification (ECVET). However, it could not function as competitive with BIOTALENT courses, since a) it is not free of charge and b) it does not cover the thematology of BIOTALENT.

PRACTICE GR 04 – E learning University of Athens_ 3

TITLE/ABBREVIATION of the e-learning course/ seminar	Cosmetology: Cosmetics' Preparation Method from Natural Raw Materials and Medicinal Plants (**Κοσμητολογία: Μέθοδος Παρασκευής Καλλυντικών από Φυσικές Πρώτες Ύλες και Φαρμακευτικά Φυτά**)
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Fully online with facilitators
Providing Institution/ Organisation/editor	Vocational Training Center of the National and Kapodistrian University of Athens
Access (free, in charge)	In charge (660-700 Euros)
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	local
Duration in hours	135

Vipera ammodytes ©NHMC

Certificate/Diploma (ECTS credits)	Certificate of attendance ECVET: 11.25
Technical requirements	(Access to) computer + internet connection
Web address/link	https://elearn.elke.uoa.gr/show_programs.php?catID=all&prID=460
Users/ target group	Graduated Biologists, Agronomists, Doctors, Pharmacists, Physicists, Chemists, Estheticians, Physiotherapists, Nutritionists and graduates of Institutes of Vocational Training in related disciplines with professional experience. Basic knowledge of Chemistry is necessary.
Language of the e-learning course/ seminar	Greek
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	5 months

Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	Upon successful completion of the trainee program, students will be able to: • list the main cosmetic products and functions • compare commercial cosmetic formulations and select the optimum for every need • evaluate the different forms of cosmetic formulations and their properties • select the appropriate raw materials for the preparation of his/her own cosmetics • utilizes plants and flowers of Greece for the production of natural cosmetics
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	virtual mobility platform, videos, pdfs, ppts, xlss, quizzes, links, etc.
Accessible open content systems or accessible closed content systems	closed content

Ballota acetabulosa ©NHMC

Other comments (e.x. public data on user ratings of the course/ seminar)	In the sections of the trainee program, the student learns how to extract essential oils, and cultivate herbs, as well as which the main herbs are and what their beneficial properties are. Thus, beyond the theoretical knowledge and definitions, the provided educational material includes tested recipes and step-by-step instructions on how to prepare cosmetics, with these natural ingredients (soaps Face and body creams, shampoos and shower gels, special oils uses and others). Finally, in order for a firm to maintain its competitive edge, it is required to create a business plan with clear form and structure, and to define business objectives. So it is also presented how a company can overcome business difficulties and lead to a successful entrepreneurship characterized by maintaining viability. Crucial functions for this purpose; are the management of human resources and marketing.

Findings and conclusions

As every course provided by the Vocational Training Center of the National and Kapodistrian University of Athens, this one is both of high standards and under European certification (ECVET). However, it could not function as competitive with BIOTALENT courses, since a) it is not free of charge and b) it does not cover the thematology of BIOTALENT.

PRACTICE GR 05 – E learning University of Athens_ 4

TITLE/ABBREVIATION of the e-learning course/ seminar	The Production of Pharmaceutical and Parapharmaceutical (Over The Counter) Products (**Η Παραγωγή Φαρμακευτικών και Παραφαρμακευτικών Προϊόντων**)
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Fully online with facilitators
Providing Institution/ Organisation/editor	Vocational Training Center of the National and Kapodistrian University of Athens

Access (free, in charge)	In charge (520-550 Euros)
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	local
Duration in hours	85
Certificate/Diploma (ECTS credits)	Certificate of attendance ECVET: 7.08
Technical requirements	(Access to) computer + internet connection
Web address/ link	https://elearn.elke.uoa.gr/show_programs.php?catID=all&prID=362
Users/ target group	Graduates of Universities or/and Technological Education Institutes of Greece or Europe and secondary school graduates with relevant professional experience
Language of the e-learning course/ seminar	Greek
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	4 months
Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	It aims to present the competences and knowledge that a manager in various relevant fields should have, such as Chemistry, Economics, and Environment.
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	virtual mobility platform, videos, pdfs, ppts, xlss, quizzes, links, etc.

Accessible open content systems or accessible closed content systems	closed content
Other comments (e.x. public data on user ratings of the course/ seminar)	

Findings and conclusions

As every course provided by the Vocational Training Center of the National and Kapodistrian University of Athens, this one is both of high standards and under European certification (ECVET). However, it could not function as competitive with BIOTALENT courses, since a) it is not free of charge and b) it does not cover the thematology of BIOTALENT.

Thymbra capitata ©NHMC

Pelophylax cretensis ©NHMC

PRACTICE GR 06 – E learning University of Athens_ 5

TITLE/ABBREVIATION of the e-learning course/ seminar	Aromatherapy-Herbal therapy (**Αρωματοθεραπεία-Βοτανοθεραπεία**)
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Fully online with facilitators
Providing Institution/ Organisation/editor	Vocational Training Center of the National and Kapodistrian University of Athens
Access (free, in charge)	In charge (660-700 Euros)
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	local
Duration in hours	120
Certificate/Diploma (ECTS credits)	Certificate of attendance ECVET: 10
Technical requirements	(Access to) computer + internet connection
Web address/link	https://elearn.elke.uoa.gr/show_programs.php?catID=all&prID=633
Users/ target group	Graduated Biologists, Agronomists, Doctors, Pharmacists, Physicists, Chemists, Estheticians, Physiotherapists, Nutritionists and graduates of Institutes of Vocational Training in related disciplines with professional experience.
Language of the e-learning course/ seminar	Greek
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	4 months

Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	The students will be informed about which the aromatic and medicinal plants are and how to use them for therapeutic purposes. Data for both the cultivation of medicinal and aromatic plants, as well as the business prospects of this occupation will also be provided. They will also analyze various herbal medicinal products, as well as materials, appliances and utensils for their successful and safe preparation. Some very important issues will also be described, such as the safety of herbal medicinal products and ways of their proper preparation, following the Pharmaceutic Industries and the corresponding Monographs.
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	virtual mobility platform, videos, pdfs, ppts, xlss, quizzes, links, etc.
Accessible open content systems or accessible closed content systems	closed content
Other comments (e.x. public data on user ratings of the course/ seminar)	

Findings and conclusions

As every course provided by the Vocational Training Center of the National and Kapodistrian University of Athens, this one is both of high standards and under European certification (ECVET). However, it could not function as competitive with BIOTALENT courses, since a) it is not free of charge and b) it does not cover the thematology of BIOTALENT.

PRACTICE GR 07 – E-learning from Nature (Erasmus + project)

TITLE/ABBREVIATION of the e-learning course/ seminar	E-learning from Nature- E-lessons
TYPE of e-learning course/ seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Fully only online without facilitators
Providing Institution/ Organisation/editor	Vocational Training Center (VTC) "Epimorfotiki Kilkis SM llc
Access (free, in charge)	free
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	-
Duration in hours	free
Certificate/Diploma (ECTS credits)	-
Technical requirements	(Access to) computer + internet connection
Web address/ link	http://enature.pixel-online.org/learning_science_EL.php
Users/ target group	The direct target groups of the E-learning from Nature project are Science and English teachers in secondary schools (students aged 14 to 19) and Secondary school students
Language of the e-learning course/ seminar	Greek/English/Dutch/Irish/Italian/Lithuanian/Portugese/ Romanian
Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	Continuous

Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	It is an Erasmus+ Programme which aims to: • Improve students' low achievements in scientific subjects • Motivate secondary school students to learn science • Consolidate student knowledge of science subject Small video lessons about the flora, the fauna, the natural elements and any other human intervention of scientific interest of a specific environmental area. These lessons aim at identifying the connection between the above mentioned natural elements with school scientific curricular activities and the related basic skills to be acquired.
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	videos, photos, drawings, etc.
Accessible open content systems or accessible closed content systems	Open content
Other comments (e.x. public data on user ratings of the course/ seminar)	

Findings and conclusions

This open-source platform with the self-taught video tutorials seems friendly to young people and school teachers, it is free of charge and multilingual. However, the courses are not certified and there is no tutor to guide the learning experience, so it is definitely not competitive with BIOTALENT courses.

Salvia pomifera ©NHMC

Ichthyosaura alpestris ©NHMC

PRACTICE GR 08 –University of Aegean: E – lifelong learning

TITLE/ABBREVIATION of the e-learning course/ seminar	Education for the environment and sustainability (**Εκπαίδευση για το περιβάλλον και την αειφορία**)
TYPE of e-learning course/seminar (fully only online with facilitators, fully only online without facilitators, blended, other)	Fully online with facilitators
Providing Institution/ Organisation/editor	University of Aegean: E – lifelong learning
Access (free, in charge)	In charge (500 Euros)
Recognition of the e-learning course/ seminar (worldwide, European, national, local)	local
Duration in hours	96
Certificate/Diploma (ECTS credits)	Certificate of attendance ECVET: 4.8
Technical requirements	(Access to) computer + internet connection
Web address/ link	http://e-epimorfosi.aegean.gr/course/%ce%b5%ce%ba%cf%80%ce%b1%ce%af%ce%b4%ce%b5%cf%85%cf%83%ce%b7-%ce%b3%ce%b9%ce%b1-%cf%84%ce%bf-%cf%80%ce%b5%cf%81%ce%b9%ce%b2%ce%ac%ce%bb%ce%bb%ce%bf%ce%bd-%ce%ba%ce%b1%ce%b9-%cf%84%ce%b7%ce%bd-%ce%b1/
Users/ target group	Teachers of all educational levels, Educators and members of various organizations and agencies (Development Agencies, NGOs, etc.) interested in implementing Education for Environment and Sustainability in practice.
Language of the e-learning course/ seminar	Greek

Frequency of the e-learning course/ seminar: (annual, continuous, regular, specific, only W/E)	4 months
Day time of the e-learning course/ seminar sessions (morning, afternoon, continuous	Continuous
Brief description, tasks	In the frames of this program students will be able to understand the most important contemporary issues of sustainability, become familiar with the basic features and pedagogical principles of Education for Environment and Sustainability, as well as learn basic strategies and teaching techniques to implement such education both at school and in local communities. With the knowledge and skills to be acquired during the program they will be able to shape educational activities on the environment and sustainability, depending on the sector in which they operate.
Learning tools (Videos, PDFs, PPTs, Links, On line games, Virtual Labs etc)	virtual mobility platform, videos, pdfs, ppts, xlss, quizzes, links, etc.
Accessible open content systems or accessible closed content systems	closed content
Other comments (e.x. public data on user ratings of the course/ seminar)	

Findings and conclusions

All the courses provided by the Vocational Training Center of the University of Aegean are being implemented via **a user-friendly software** (educational platform) adjusted to the Distance Learning Principles. Additionally, **full educational support** with tutor as well as certification are also provided

The specific course could not function as competitive with BIOTALENT courses, since a) it is rather expensive and b) it does not cover the full thematology of BIOTALENT.

Podarcis cretensis ©NHMC

biotalent
TALENT IN BIODIVERSITY

ii) Employment and skills for Biodiversity and STEM jobs in general

INTRODUCTION

The biodiversity and STEM labor market in private or public sector that could very well be BIOTALENT's audience could be generally divided in two main groups: a) Education and b) Other related jobs.

a) **Education** has a personal and individual characteristic. That means that each person learns in his own and unique way. The procedure of learning cannot be finished just through a specific educational system, but it is an endless process that happens lifelong.
The education labor market involves three major pillars: 1) **Formal Education** (Kindergartens, Primary & Secondary Schools, Universities, Polytechnics, Technological Educational Institutes and Academies), 2) **Non-Formal Education** (Schools/Institutes of Vocational Training, Centers of Environmental Education, Centres of Life-long Learning, Colleges, etc.) and 3) **Informal Education** (Educational Institutes, Museums, and Science Centres).

b) **Other related jobs** include scientific, communicational, public awareness, technical, green space and administrative staff of Environmental Conservation and Management Societies and Institutions, Natural History Museums, Science Centres, Zoological gardens, Botanical gardens and Nature Reserves. More precisely they could be STEM scientists, environmentalists, conservation managers, natural reserves' guides and guards, animal feeders, vets, gardeners, agriculturalists, zoologists, nature photographers, environmental policy makers, lawyers on environmental legislation, environmental economists, environmental engineers and many others.

The above is relevant to Biodiversity and Climate change jobs are very demanding and need specialized and well trained people, who should also speak several languages.
Among others, the necessary skills for those job seekers could be:
Specializations: Technical diploma, Bachelor's degree, Master's degree, Ph.D.
Research, teaching and/or professional experience and specialization
Other skills:

- extensive knowledge of, and passion for nature;
- experience of writing and editing copy for communication material, knowledge of mobile and web space content management, ability to organize events addressing multiple national and international target groups, experience of environmental education programs and interpretive activities, qualifications in environmental communication or other environmental qualifications, etc.;
- scientific background in animal care, a good fitness level, the will to learn more about animals each day;
- experience in theatrical play, story-telling, movie making, activities and crafts designing, cultural events, children communication, etc.

In the following pages, the above issues will be demonstrated and analyzed in detail, for each of the BIOTALENT's partners' countries, except Hungary, since the research of our Hungarian partners has not revealed any real data, useful for this analysis.

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TALENT IN BIODIVERSITY

Biodiversity and STEM jobs in Belgium

Cistus salvifolius ©NHMC

Belgian biodiversity labor market: necessary skills for job seekers

Contribution from Partner:	RBINS
Reporting to:	Activity Pole 'Quality Assurance and Validation' – NHMC UoC
Delivery date:	13 February 2017
Reporter:	Tine Geunis

Recent data on benefit allowances seem to show a positive evolution for Belgium, with a considerable decrease of almost 5% in 2016 (RVA 2016). However, recently imposed changes concerning benefit allowances and distributions have surely affected these numbers, and therefore must be read cautiously. Unemployment in Belgium currently remains under the EU mean, but only slightly, with 8.8 % (statbel 2016). Analysing general unemployment in Belgium is far beyond the scope of this document; instead it attempts to summarise findings on job skills required for the Belgian biodiversity labor market specifically, with the aim to identify the potential for BIOTALENT to contribute to the employability of Belgian job seekers.

Doing this has provided us with three major insights. Firstly, it would seem rather premature to make mention of an actual Belgian biodiversity labor market, as the search for jobs concerning this subject only has listed us with very few results (PhD researchers are one example here; however they are not considered further in this document, as the skills required for these positions are far beyond the scope of the BIOTALENT course) . This finding is much in line with the lack of e-courses concerning biodiversity and climate change in Belgium (see e-learning: best practices for Belgium). While the concept of biodiversity has certainly found its way to the general public, a specific job platform concerning biodiversity does not seem to exist (yet).

Given this current reality, it would be sensible to present the BIOTALENT course to the learner as an extra schooling that could improve skills within current employment of the learner, *or* as an added skill for learners when applying for biodiversity jobs oriented towards the natural sciences and environmental management in general, as discussed in the next paragraphs.

Secondly, formal and informal educational institutions seem to harbor a wide variety of jobs that deal with the topic of biodiversity, but it has been difficult to assess the actual number of applications and accompanying skills required, as private institutions especially remain protective over staff numbers and details. It is likely, however, that the majority of potential learners will come from these educational institutions, as increasing attention within Belgian formal education goes to biodiversity and climate change

within scientific modules (see here e.g. the curriculums of GO, Katholiek Onderwijs Vlaanderen and Fédération Wallonie-Bruxelles). Moreover, while the subjects of biodiversity and climate change are elaborated on within Belgium's official curricula, recent research shows that at least Flemish aspiring teachers still lack important insights into climatic processes (Boussemaere 2016).

Additionally, there exists in Belgium a thriving community of conservational organisations, NGOs and even zoological and botanical institutions that contribute to knowledge concerning biodiversity and other topics, both for a general public, as well as within formal education and even within the political landscape in Belgium (see here the attached list of Belgian stakeholders).

Taken together, these educational actors are thought to benefit from a low budget, short term engagement to improve their knowledge and skills concerning biodiversity and climate change.

Finally, it would seem that certification plays a key role in Belgian's job market, as the majority of biodiversity related jobs, whether technical, educational or scientific, required an appropriate degree or certificate. It is therefore suggested to pay specific attention to the future accreditation of the BIOTALENT course, as many of both job seekers and employees are likely to seek out the training that is not only most relevant, but can also boast impressive and relevant EU certification.

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PRACTICE 01 – Formal Belgian education

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Formal Belgian education, ranging from primary school to universities, adult learning organisations, and vocational education.
Public/Private	Public & private
Number of employees	Flanders: 183,835 Wallonia: 100,000
Brief profile of Key actor, Stakeholder or Enterprise	Teachers usually direct and guide pupils within the formal environment of a public or private school, academy or university, on an array of topics including biodiversity and climate change
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/ Place/ Duration (permanent, short term, hourly job) / Work development potential/Other issues	Primary and secondary teachers (natural sciences) **Place**: Throughout Belgium, public and private schools **Duration**: Fulltime or part time
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	Bachelor's degree or higher Teaching experience might be required **Language**: Dutch and/or French and/or German and/or English
Number of positions for this employment	Flanders: 1000 Wallonia: unknown
Other issues	

Type of Employment 2: Description/Objectives/ Place/ Duration (permanent, short term, hourly job)/Work development potential / Other issues	Academy teachers **Place**: Throughout Belgium **Duration**: Fulltime or part time
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	**For artistic modules**: bachelor's degree **Others**: Master's degree or PhD necessary Teaching or professional experience might be required **Language**: Dutch and/or French and/or German and/or English
Number of positions for this employment	Flanders: unknown, applications are sent out irregularly and per institution Wallonia: unknown, applications are sent out irregularly and per institution
Other issues	
Type of Employment 3: Description/Objectives/ Place/ Duration (permanent, short term, hourly job)/Work development potential/Other issues	Professors and university lectors
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	Master degree of PhD necessary Research experience, professional experience and specialisation might be required **Language**: Dutch and/or French and/or German and/or English

Number of positions for this employment	Flanders: unknown, applications are sent out irregularly and per institution Wallonia: unknown, applications are sent out irregularly and per institution
Other issues	

Findings and conclusions

Teachers will undoubtedly make out a large part of our audience. Belgian teachers are given several days and some funding each year for extra training concerning their relevant topic, which may be an extra incentive for them to join the BIOTALENT course. Within schools and academies specifically, the topics of biodiversity and climate change have become increasingly important, too, especially in primary and secondary schools, making it perhaps BIOTALENT's number 1 'market'. A large proportion of the latter also visits the Royal Belgian Museum for the Natural Sciences on a yearly basis, accompanied by their teachers, providing BIOTALENT with easy and continuous access to this market (consider here promotion, feedback, etc..).

Podarcis muralis ©NHMC

PRACTICE 02 – Informal Belgian nature education and conservation societies and institutions

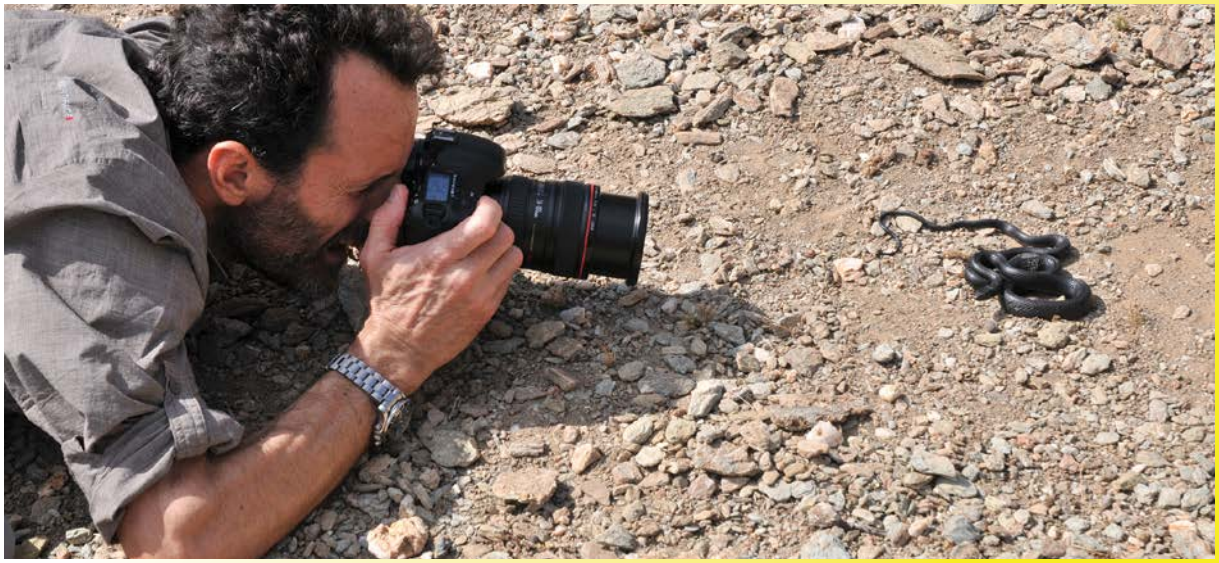
Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Informal nature education and conservation societies encompassing organisations such as Natuurpunt, De Helix, de milieuboot, Leefmilieu Brussel, Gaia, Wervel, WWF, etc..
Public/Private	Public & private
Number of employees	Unknown
Brief profile of Key actor, Stakeholder or Enterprise	
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/ Place/ Duration (permanent, short term, hourly job)/ Work development potential / Other issues	Educational staff **Objectives** include receiving, assisting, educating and communicating with a(n) (visiting) audience concerning the topics relevant for the organisation. Other objectives may to be participate in, prepare for and organise public meetings and debates, write or assist in the preparation of info leaflets, folders, reports, lobbying, etc. **Duration**: undetermined
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/ Teaching experience/ Languages/Other skills	Bachelor's degree or higher Teaching and/or professional experience might be required, especially within the NGO and education sectors **Language**: Dutch and/or French and/or German and/or English
Number of positions for this employment	Unknown
Other issues	

Findings and conclusions

Together with formal education, informal educational institutions will quite likely deliver the majority of potential learners for BIOTALENT in Belgium. As a considerable part of (educational) staff will consist of volunteers, motivation for both work and schooling will be high, but time reserved for extra schooling might at the same time be limited.

PRACTICE 03 – Informal educational institutions/Museums

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	This stakeholder includes informal educational institutions/museums that are at least partially concerned with educational activities on the natural sciences. In Belgium, this includes among others: the Royal museum for the Natural Sciences (RBINS), Brussels; Museum voor Dierkunde, Elsene; Entomopolis, Lieteberg and Hexapoda, Waremme, the Zwin, Brugge, etc. Note here that there is some overlap with n° 04, zoological and botanical gardens/institutions, nature reserves.
Public/Private	Public & private
Number of employees	RBINS: 400+ Others: unknown
Brief profile of Key actor, Stakeholder or Enterprise	The museums listed above aim to, among other, manage (live) collections, facilitate and organise scientific research, and attempt to be a link between scientists and (lay) audiences. In addition, they have been seen to contribute actively to public awareness concerning climate change, biodiversity loss and others. See here e.g. the 'ikgeeflevenaanmijnplaneet' project by the entomolgy department of RBINS, and the Entomopolis' gallery of insects dedicated to the arthropods' pivotal role within the global ecosystem.



Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/ Place/Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Scientific staff (research, collection management)
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/Research experience (publications, participation in conferences etc)/Teaching experience/ Languages/Other skills	Master's degree PhD **Language**: Dutch and/or French and/or German and/or English
Number of positions for this employment	Unknown, applications are sent out irregularly and per institution
Other issues	
Type of Employment 2: Description/Objectives/ Place/Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Volunteers, public sponsors and regular visitors
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/Research experience (publications, participation in conferences etc)/Teaching experience/ Languages/Other skills	No specific skill requirements **Language:** Dutch and/or French and/or German and/or English
Number of positions for this employment	Unlimited
Other issues	

Type of Employment 3: Description/Objectives/ Place/ Duration (permanent, short term, hourly job) / Work development potential/ Other issues	Employees within educational services and scientific staff, communication officers and technical staff occupied with green management or preservation, as well as collection management.
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/ Teaching experience/ Languages/Other skills	Technical diploma Bachelor's degree Master's degree PhD **Language:** Dutch and/or French and/or German and/or English
Number of positions for this employment	Unknown, applications are sent out irregularly and per institution.
Other issues	

Findings and conclusions

Museums and other similar institutions represent here the vast array of informal educational institutions that operate within Belgium. They will undoubtedly come to make out an important 'source' of potential learners for BIOTALENT, as within these institutions a large number of volunteering/educational staff are dedicated to improving public knowledge concerning the natural sciences, biodiversity, conservation and many other topics on a daily basis. This stakeholder differs from the formal educational stakeholder likely, and mainly, when it comes to the background of the learners. Here, a large variety of scientific, educational and communication backgrounds are to be expected.

PRACTICE 04 – Zoological and botanical gardens/institutions, nature reserves

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Key stakeholders here are quite numerous, including 'Zoo van Antwerpen', Antwerpen; 'Pairi Daiza', Cambron-Casteau; 'de Sahara', Lommel; 'Plantentuin van Meise', Meise; Olmense Zoo Antwerpen; Planckendael, Mechelen; Serpentarium, Blankenberge; Public Aquarium, Koekelberg; Forestia, Liège; Domein van de Grotten van Han, Namur; Natuurreservaat De Zegge, Antwerpen; Het Zwin, Brugge; and so on.
Public/Private	Public & private
Number of employees	Zoo van Antwerpen: +/- 360 + volunteers Plantentuin Meise: 150+ employees and volunteers Others: unknown
Brief profile of Key actor, Stakeholder or Enterprise	Zoological and botanical gardens and nature reserves have to some extent overlapping functions that include the management, protection and displaying of endemic and exotic species of plants and animals, whereby particular efforts go into displaying living collections to a public audience. As such, many of these institutions spend considerable effort into educating and informing their audiences about issues that affect many of the species on exhibit, such as global biodiversity loss and climate change.

Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/ Place/Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Green space managers, technical staff **Duration**: undetermined **Objectives** are to manage and maintain flora & fauna, do maintenance work; to educate visiting (lay) public, to assist into maintaining a healthy ecosystem
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/ Teaching experience/ Languages/Other skills	Technical diploma Bachelor's degree Master's degree **Other skills:** So-called **'niche' degrees** are an added plus here: science communication, green management, forester's degree, … Extensive knowledge of, and passion for nature is an added plus here (bird spotting, knowledge of medicinal plants, fungi, etc.) Adequate (good) physical health **Language**: Dutch and/or French and/or German and/or English
Number of positions for this employment	To the most extent unknown; applications are sent out irregularly and per institution. Wallonian Zoo Pairi Daiza is currently looking for 'hundreds' of new (temporary) employees, including guides, kitchen and sales staff, technical staff, etc.
Other issues	
Type of Employment 2: Description/Objectives/ Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Educational and communicational staff Tasks include preparing, receiving, guiding, communicating with and educating visiting (lay) audiences concerning subjects relevant to the specific institution Considering the fast developing fields within natural sciences, extra training is essential for educational, and to a lesser extent communication staff.

Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/ Teaching experience/ Languages/Other skills	Bachelor's degree Master's degree **Other skills:** So-called **'niche' degrees** are an added plus here: science communication, green management, forester's degree, … Extensive knowledge of, and passion for nature is an added plus here (bird spotting, knowledge of medicinal plants, fungi, etc.), especially when it comes to rare and exotic flora and fauna (consider here e.g. the giant pandas currently in the care of Pairi Daiza) **Language**: Dutch and/or French and/or German and/or English
Number of positions for this employment	Unknown; applications are sent irregularly and per institution
Other issues	
Type of Employment 3: Description/Objectives/ Place/ Duration (permanent, short term, hourly job)/ Work development potential/ Other issues	Scientific staff **Duration**: undetermined **Objectives**: perform research in a field relevant to the particular institution, often with a focus on specimens that are part of the collection of the particular institution.
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/Research experience (publications, participation in conferences etc)/Teaching experience/Languages/ Other skills	Bachelor's degree Master's degree PhD **Professional and research experience** might be required, especially when it comes to rare and exotic flora and fauna (consider here e.g. the giant panda's currently in the care of Paira Daiza) **Language:** Dutch and/or French and/or German and/or English
Number of positions for this employment	Unknown; applications are sent irregularly and per institution
Other issues	

Findings and conclusions

Actors operating within these institutions might be taking up a growing role of importance when it comes to biodiversity issues and global climate change, with educational and communication staff in particular. They are in regular contact with (lay) audiences, and due to the often informal and sometimes even exotic nature of their institutions, they might attract audiences that would not easily find their way to more formal, serious bodies of knowledge. It also undoubtedly adds to their credibility to invest more in education concerning biodiversity and climate change, both for their own staff as well as a visiting audience. As such, it would be sensible to invest in communication with these institutions, so that they are and remain fully aware of BIOTALENT.

BELGIUM

Key actor, Stakeholder or Enterprise	Existing and New jobs	Skill requirements	
		Existing and New jobs	New already implemented ideas for enterprises
Formal education	Teachers, academy teachers, professors	Bachelor's degree Master's degree Phd Teaching/research experience	
Informal education	Educational and communication staff	Bachelor's degree Master's degree Phd Teaching/research experience	
Museums	Educational and communication staff, technical staff	Technical degree Bachelor's degree Master's degree Phd Teaching/research experience	
Zoological and botanical gardens/ institutions and nature reserves	Educational and communication staff, technical staff, maintenance workers	Technical degree Bachelor's degree Master's degree Phd Teaching/research experience	

Asphodeline lutea ©NHMC

biotalent
TALENT IN BIODIVERSITY

Biodiversity and STEM jobs in Portugal

Chamaeleo chamaeleon ©NHMC

Portuguese biodiversity labor market: necessary skills for job seekers

Contribution from Partner:	Edufor Training Center (EduFor)
Reporting to:	Activity Pole 'Quality Assurance and Validation' – NHMC UoC
Delivery date:	13 February 2017
Reporter:	Carlos Rodrigues, António Casal

PRACTICE FOR PORTUGAL 1

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade de Aveiro, Departamento de Biologia
Public/Private	Public
Number of employees	45 -50
Brief profile of Key actor, Stakeholder or Enterprise	Teaching and investigation
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Teaching and investigation
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	PhD and speciality in several fields (algae, vascular plants, invertebrates, vertebrates, molecular biology & environment, etc)
Number of positions for this employment	42
Other issues	

PRACTICE FOR PORTUGAL 2

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade do Minho, Departamento de Biologia
Public/Private	Public
Number of employees	35 -45
Brief profile of Key actor, Stakeholder or Enterprise	Teaching and investigation
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/Work development potential/Other issues	Teaching and investigation
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	PhD and speciality in several fields (algae, vascular plants, invertebrates, vertebrates, molecular biology & environment, etc)
Number of positions for this employment	32
Other issues	

PRACTICE FOR PORTUGAL 3

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade de Coimbra, Departamento de Ciências da Vida
Public/Private	Public
Number of employees	93
Brief profile of Key actor, Stakeholder or Enterprise	Teaching and investigation

Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Teaching and investigation
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	PhD and speciality in several fields (biodiversity & plant biotechnology, ecology, molecular biology & environment, etc)
Number of positions for this employment	65
Other issues	

PRACTICE FOR PORTUGAL 4

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade de Lisboa, Faculdade de Ciências
Public/Private	Public
Number of employees	619
Brief profile of Key actor, Stakeholder or Enterprise	Teaching and investigation
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Teaching and investigation in Animal Biology and Vegetal Biology
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	PhD and speciality in several fields (Sea sciences & environment, ecology, evolution, environment changes, molecular biology, plant biotechnology, etc)
Number of positions for this employment	94
Other issues	

PRACTICE FOR PORTUGAL 5

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade de Évora, Departamento de Biologia
Public/Private	Public
Number of employees	20 to 25
Brief profile of Key actor, Stakeholder or Enterprise	Teaching and investigation

Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Teaching and investigation in Biology and Agronomy
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	PhD and speciality in several fields (Ecology, evolution, agronomy, molecular biology, plant biotechnology, Conservation value of natural vegetation, etc)
Number of positions for this employment	16
Other issues	

Tarentola mauritanica ©NHMC

PRACTICE FOR PORTUGAL 6

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade do Algarve, Faculdade de Ciências e Tecnologia
Public/Private	Public
Number of employees	207
Brief profile of Key actor, Stakeholder or Enterprise	Teaching and investigation
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job) / Work development potential/Other issues	Teaching and investigation in Biology and Bioengineering
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	PhD and speciality in several fields (Biological Resources and Mediterranean Foods, molecular biology, Sea & environment, etc)
Number of positions for this employment	48
Other issues	

PRACTICE FOR PORTUGAL 7

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade do Açores, Departamento de Biologia
Public/Private	Public
Number of employees	36
Brief profile of Key actor, Stakeholder or Enterprise	Teaching and investigation
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Teaching and investigation in Biology and Bioengineering
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	PhD and speciality in several fields (Anatomy & zoological taxonomy, molecular biology, Sea & environment, Sea biology, etc)
Number of positions for this employment	26
Other issues	

PRACTICE FOR PORTUGAL 8

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade da Madeira, Faculdade de Ciências da Vida
Public/Private	Public
Number of employees	25 to 30
Brief profile of Key actor, Stakeholder or Enterprise	Teaching and investigation
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job) / Work development potential/Other issues	Teaching and investigation in Biology and Bioengineering
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	PhD and speciality in several fields (Anatomy & zoological taxonomy, molecular biology, Sea & environment, Sea biology, etc)
Number of positions for this employment	18
Other issues	

PRACTICE FOR PORTUGAL 9

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade do Porto, Faculdade de Ciências
Public/Private	Public
Number of employees	403
Brief profile of Key actor, Stakeholder or Enterprise	Teaching and investigation
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/Duration (permanent, short term, hourly job) / Work development potential / Other issues	Teaching and investigation in Biology and Bioengineering

Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/ Languages/Other skills	PhD and speciality in several fields (Biodiversity & Genetic Resources, molecular biology, Sea & environment, Sea biology, etc)
Number of positions for this employment	64
Other issues	

PRACTICE FOR PORTUGAL 10

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade Nova de Lisboa, Faculdade de Ciências e Tecnologia
Public/Private	Public
Number of employees	632
Brief profile of Key actor, Stakeholder or Enterprise	Teaching and investigation
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Teaching and investigation in Biology and Bioengineering
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/ Languages/Other skills	PhD and speciality in several fields (environment & sustainability,, molecular biology, Sea & environment, etc)
Number of positions for this employment	45
Other issues	

PRACTICE FOR PORTUGAL 11

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Instituto Nacional de Investigação Agrária e Veterinária
Public/Private	Public
Number of employees	618
Brief profile of Key actor, Stakeholder or Enterprise	Investigation
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Investigation in genetic resources
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/Research experience (publications, participation in conferences etc)/ Teaching experience/Languages/Other skills	PhD and speciality in genetics
Number of positions for this employment	11
Other issues	
Type of Employment 2: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Investigation in plant improvement
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/ Other skills	PhD and speciality in plant genetics
Number of positions for this employment	15
Other issues	

Type of Employment 3: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Investigation in ecophysiology
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/ Other skills	PhD and speciality in plant ecophysiology
Number of positions for this employment	8
Other issues	
Type of Employment 4: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Investigation in animal improvement and reproduction
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/ Other skills	PhD and speciality in animal improvement and reproduction
Number of positions for this employment	9
Other issues	

PRACTICE FOR PORTUGAL 12

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Instituto da Conservação da Natureza e Florestas
Public/Private	Public
Number of employees	1318
Brief profile of Key actor, Stakeholder or Enterprise	Conservation and sustainable use, valorisation, enjoyment and public recognition of the natural heritage, promoting the sustainable development of forest areas and associated resources
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Senior Technician (management of protected natural areas in Portugal)
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/Research experience (publications, participation in conferences etc)/Teaching experience/ Languages/Other skills	Degree in biology or forest engineering and particular requirements
Number of positions for this employment	509
Other issues	
Type of Employment 2: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Nature guard
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	Secondary school degree, professional course in nature
Number of positions for this employment	121
Other issues	

PRACTICE FOR PORTUGAL 13

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Museu Nacional de História Natural e da Ciência
Public/Private	Public
Number of employees	68
Brief profile of Key actor, Stakeholder or Enterprise	To promote curiosity and public understanding about nature and science
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Senior Technician (Conservation and study of biological collections)
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/ Languages/Other skills	Degree in botanic or zoology and particular requirements
Number of positions for this employment	11
Other issues	
Type of Employment 2: Description/Objectives/Place/ Duration (permanent, short term, hourly job) / Work development potential / Other issues	Nature guard
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/ Languages/Other skills	Secondary school degree, professional course in nature
Number of positions for this employment	121
Other issues	

Thymbra capitata ©NHMC

PRACTICE FOR PORTUGAL 14

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Universidade de Trás-os-Montes e Alto Douro (UTAD), Centro de Investigação e de Tecnologias Agroambientais e Biológicas (CITAB)
Public/Private	Public
Number of employees	80
Brief profile of Key actor, Stakeholder or Enterprise	To investigate and to transfer science and technology, disseminate culture and provide specialized services.
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Investigators
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	PhD (Sustainable Agro-Food Chains, Ecointegrity, Biosystems Engineering)
Number of positions for this employment	78
Other issues	

PRACTICE FOR PORTUGAL 15

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Ministério da Educação, High school biology teachers
Public/Private	Public
Number of employees	5120
Brief profile of Key actor, Stakeholder or Enterprise	To teach natural sciences, biology and geology
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Teaching
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	Degree in Biology and/or geology
Number of positions for this employment	5120
Other issues	

Findings and conclusions

Many biology teachers seek specialized training.

Podarcis cretensis ©NHMC

Ablepharus kitaibelii ©NHMC

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TALENT IN BIODIVERSITY

Biodiversity and STEM jobs in Greece

Origanum scabrum ©NHMC

Greek biodiversity labor market: necessary skills for job seekers

Contribution from Partner:	NHMC UoC
Reporting to:	Activity Pole 'Quality Assurance and Validation' – NHMC UoC
Delivery date:	20 February 2017
Reporter:	Iasmi Stathi

The biodiversity and STEM labor market in private and public sector in Greece could be divided in two main groups: a) teachers/educators and b) other related jobs.
a) **Education** has a personal and individual characteristic. That means that each person learns with his own and unique way. The procedure of learning cannot be finished and successful just through a specific educational system, but it is an endless process that happens lifelong. The Greek teachers/educators are involved in the three pillars of Education in Greece, i.e. formal, non-formal and informal education. Those pillars are analyzed below in practices 1, 2 and 3 respectively.
b) **Other related jobs** include environmentalists, conservation managers, natural reserves' guides and guards, animal feeders, vets, gardeners, agriculturalists, zoologists, nature photographers, environmental policy makers, lawyers on environmental legislation, environmental economists, environmental engineers and many others. The other related jobs group is analyzed in practices 4 and 5.

PRACTICE 01 – Formal STEM education providers in Greece

The Greek formal educational system is mainly divided into three levels: primary, secondary and tertiary, with an additional post-secondary level providing vocational training. Primary education is divided into kindergarten lasting one or two years, and primary school spanning six years (ages 6 to 12). Secondary education comprises two stages: Gymnasio (variously translated as Middle or Junior High School), a three-year school, after which students can attend Lykeion (an academically oriented high school) or Vocational training. Higher Tertiary education is provided by Universities and Polytechnics, Technological Educational Institutes (T.E.I.) and Academies which primarily cater for the military and the clergy. Undergraduate courses typically last 4 years (5 in polytechnics and some technical/art schools, and 6 in medical schools), postgraduate (MSc level) courses last from 1 to 2 years and doctorates (PhD level) from 3 to 6 years.

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Formal environmental and STEM education, i.e. Kindergartens, Primary schools, Secondary Schools, Universities, Polytechnics, Technological Educational Institutes and Academies.
Public/Private	Public & private
Number of employees	~163.000
Brief profile of Key actor, Stakeholder or Enterprise	Within the frames of formal education, teachers teach and approach several STEM topics including biodiversity and climate change.
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Kindergarten, Primary and Secondary school teachers (STEM) **Place**: Throughout Greece in public and private schools. Greek schools all over the world (Europe, USA, Australia, South Africa, etc.) **Duration**: Fulltime or part time
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	**Specialization**: Bachelor's degree, Master's degree, Ph.D. Teaching experience might be required **Language**: Greek and/or English
Number of positions for this employment	~158.000
Other issues	
Type of Employment 2: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Teachers in Adult Learning and Vocational Education **Place**: public and private schools throughout Greece **Duration**: Fulltime or part time

Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	**Specialization**: Bachelor's degree, Master's degree, Ph.D. Teaching or professional experience might be required **Language**: Greek and/or English
Number of positions for this employment	~15.000
Other issues	
Type of Employment 3: Description/Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Educators/Professors of Universities (22 in Greece) and Technological Education Institutes (14 in Greece) **Place**: in public higher education throughout Greece **Duration**: Fulltime or part time
Skills requirements: Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	**Specialization**: Master's degree, Ph.D. Research experience, professional experience and specialisation might be required **Language**: Greek and/or English
Number of positions for this employment	Unknown
Other issues	

Findings and conclusions

The topics of biodiversity and climate change have become increasingly important in formal education in Greece, so teachers in every level of formal education in Greece could make out a large part of BIOTALENT's audience. At the same time, STEM Greek teachers not only they visit NHMC accompanying their students, but they also very often participate in relevant to their interests' seminars, organized by NHMC, which indicate that they will definitely be interested in attending BIOTALENT courses.

PRACTICE 02 – Non-formal STEM education providers in Greece

In non-formal education, the learning takes place in a formal setting, such as an educational organization, but is not formally recognized within a curriculum or syllabus framework. Although there are important differences between formal and non-formal STEM Education, important resemblances between them also exist. Moreover, many times, in order to achieve the aim and the objectives of STEM Education, the combination of these two forms is required.

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Non-formal education on Biodiversity and STEM, in Greece, could be provided by: Schools/Institutes of Vocational Training, Centers of Environmental Education, Centres/Organisations of Life-long Learning, Colleges, several private educational organisations, etc.
Public/Private	Public & private
Number of employees	Unknown
Brief profile of Key actor, Stakeholder or Enterprise	• Schools of Vocational Training provide initial vocational training to compulsory formal education graduates • Institutes of Vocational Training provide initial vocational training in non-compulsory secondary education graduates • Centers of Environmental Education aim at the environmental awareness of the population, which is highly important considering that it cannot be achieved through the deficient EE supplied by formal education and must be applied in every stage of an individual's development in order to enable the individual to be constantly aware of the developments on environmental issues • Centres of Life-long Learning provide ongoing training and general adult education, and • Colleges provide non-formal education in general • Private educational organisations provide non-formal education in specific subjects, e.g. robotics and their use in environmental protection and monitoring

Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/Objectives/Place/ Duration (permanent, short term, hourly job) / Work development potential/Other issues	Educational staff **Place**: Throughout Greece in public and private educational units. **Duration**: Fulltime or part time
Skills requirements: Transcripts/Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills	**Specialization**: Bachelor's degree, Master's degree, Ph.D. Teaching experience might be required **Language**: Greek and/or English
Number of positions for this employment	Unknown
Other issues	

Findings and conclusions

Together with formal education, informal educational institutions could also make out a large part of BIOTALENT's audience, since their educational staff always need extra training in order to receive up-to-date professional education and specialized training to be able to follow the very competitive educational market.

Chalcides ocellatus ©NHMC

PRACTICE 03 – Informal STEM education providers in Greece (Educational Institutions/Museums/Science Centres)

Informal education is a general term for education outside a standard school setting. Informal Education is the wise, respectful and spontaneous process of cultivating learning. It works through conversation and it is based on exploration and enlargement of experience. For example, informal education has activities with children, young people and adults. Sometimes there is a clear objective link to some broader plan – e.g. around the protection of an endangered animal species. It can refer to various forms of alternative education. Informal education refers even to emotions, feelings, beliefs and superstitions.

The individual is situated in the center of informal education concepts. The reaction of different persons to similar information can be different in each case, this is why it can't be predicted or controlled. Informal education is the least controlled, that's why this type of education cannot be excluded from an individual's life. It may be viewed as the learning that comes as a part of being involved in youth and community organizations. In these settings there are specialist workers or educated staff, whose job is to encourage people to think about experiences and situations. This education is a spontaneous process helping people to learn. It helps to cultivate communities, associations and relationships that make for human flourishing.

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Informal education on Biodiversity and STEM, in Greece, could be provided by Natural History Museums, Science Centres, Research Institutes, Zoological Museums , Botanical gardens Zoos, Aquaria, Information Centres of Protected Areas/Parks and many other relevant stakeholders that at least partially are concerned with educational activities on the natural sciences and STEM in general
Public/Private	Public & private
Number of employees	Unknown
Brief profile of Key actor, Stakeholder or Enterprise	Every informal educational unit reported above aims to connect science with society and to provide public awareness concerning biodiversity loss, environmental degradation, environmental protection, climate change, etc.

Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: **Description/Objectives/Place/ Duration (permanent, short term, hourly job)/Work development potential/Other issues**	Scientific staff **Objectives:** Research, collection management/curation, animal/plant care and maintenance **Place**: Throughout Greece in public and private sector **Duration**: Fulltime or part time
Skills requirements: **Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills**	**Specialization**: Bachelor's degree, Master's degree, Ph.D. Professional and/or Teaching experience might be required **Language**: Greek and/or English
Number of positions for this employment	Unknown
Other issues	
Type of Employment 2: **Description/Objectives/Place/ Duration (permanent, short term, hourly job)/Work development potential/Other issues**	Educators (e.g. Museum educators) **Objectives:** Public awareness, design and implementation of educational activities, connection of science with society ("translation" of scientific terminology and aspects in easily comprehensible terms, through interactive exhibits and hands-on activities) **Place**: Throughout Greece in public and private sector **Duration**: Fulltime or part time
Skills requirements: **Transcripts/Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/Languages/Other skills**	**Specialization**: Technical diploma, Bachelor's degree, Master's degree, Ph.D. Professional and /or Teaching experience might be required **Language:** Greek and/or English **Other skills:** experience in theatrical play, story-telling, movie making, activities and crafts designing, cultural events, children communication, etc. might be important

Number of positions for this employment	Unlimited
Other issues	

Findings and conclusions

Museums, Science Centres and other Educational Institutions represent the vast array of informal educational institutions in Greece. They will undoubtedly come to make out an important source of potential learners for BIOTALENT, as within these institutions a large number of scientific and educational staff are dedicated to improving public knowledge concerning the natural sciences, biodiversity, conservation and many other topics on a daily basis.

PRACTICE 04 – Environmental Conservation and Management Societies and Institutions in Greece

There are numerous non-governmental conservation and management organizations, societies and institutions for the protection of wild life and its habitats in Greece. Their **main activities** include scientific research, rescue of endangered animals and their rehabilitation, protection of species and habitats and their management, public awareness and sensitization and environmental education and training. Among others, their **priorities** also include: assessment of changes to ecosystems – including the alterations resulting from non-sustainable human activity, and global climate change – and documentation of policies and measures to avert degradation of ecosystems; halting the loss of biodiversity; restoration/rehabilitation of degraded ecosystems; ensuring adequate quantity and suitable quality of fresh water for human use and ecosystems requirements; wide-ranging transfer of knowledge of functions and values of natural ecosystems, as well as the sustainable practices which must be introduced.

Name/ abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	Non-governmental conservation and management organizations, societies and institutions for the protection of wild animals and their habitats, such as: • GreenPeace (http://www.greenpeace.org/greece/el/) • Biopolitics International Organisation (B.I.O.) (http://biopolitics.gr/biowp/progress/progress-by-country/greece/) • WWF (http://www.wwf.gr/en/) • Friends of the Mountain and the Sea (O.F.V.TH.) (http://omilosfi.gr/) • Η Ελληνική Εταιρία Προστασίας της Φύσης (https://eepf.gr/en) • Hellenic Ornithological Society (http://www.ornithologiki.gr/index.php?loc=en) • The Katelios Group for the Research and Protection of Marine and Terrestrial Life (http://www.kateliosgroup.org/home/about-us/) • ΑΡΚΤΟΥΡΟΣ/ARKTOYROS (http://www.arcturos.gr/) • ARCHELON-The Sea Turtle Protection Society of Greece (http://www.archelon.gr/index_eng.php) • MEDITERRANEAN SOS Network (http://medsos.gr/medsos/medsos-network.html) • Οικολογική Εταιρεία Ανακύκλωσης (http://www.ecorec.gr/ecorec/index.php?lang=en) • MOm/ The Hellenic Society for the Study and Protection of the Monk sea (http://www.mom.gr/displayITM1.asp?ITMID=382&LANG=EN) • Archipelagos Institute of Marine Conservation (http://archipelago.gr/en/) • The Greek Biotope/Wetland Centre (or EKBY by its Greek initials) (http://www.ekby.gr/ekby/en/EKBY_Profile_en.html) • The Society for the Protection of Prespa (SPP) (http://www.spp.gr/index.php?option=com_content&view=article&id=5&Itemid=5&lang=en)
Public / Private	Public & private

Number of employees	Unknown
Brief profile of Key actor, Stakeholder or Enterprise	**Organization Type:** Non-governmental, Non-profit **Activities:** Advocacy, Conservation, Education, Monitoring, Outreach, Research, Stranding
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/ Objectives/ Place/ Duration (permanent, short term, hourly job)/Work development potential/ Other issues	Scientific staff (environmentalists, engineers, STEM scientists) **Objectives:** research, monitoring, analysis, assessment, co-ordination of the environmental education programme in co-operation with the relevant staff, etc. **Duration**: permanent/short term
Skills requirements: Transcripts/ Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/ Languages/ Other skills	**Specialization**: Bachelor's degree, Master's degree, Ph.D. Research and/or professional experience might be required **Language**: Greek and/or English **Other skills:** Extensive knowledge of, and passion for nature is an added plus here (several organisms' spotting and identification, experience in field studies, knowledge of the biology of specific organisms, etc).
Number of positions for this employment	Unknown

Other issues	
Type of Employment 2: Description/ Objectives/ Place/ Duration (permanent, short term, hourly job)/Work development potential/ Other issues	Educational, communicational and public awareness staff (STEM educators, environmentalists, social scientists, awareness-raising officers, etc.) **Objectives:** receiving, assisting, educating and communicating with audience concerning fields and topics relevant to the particular institution. Other objectives may to be participate in, prepare for and organise public meetings and debates, write or assist in the preparation of brochures, newsletters, media articles, info leaflets, folders, reports, lobbying, co-ordinate the environmental education programme in co-operation with the relevant staff, participate in the content development and maintenance of SPP web and social media, etc **Extra training** might be needed **Duration**: permanent/short term/hourly job
Skills requirements: Transcripts/ Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/ Languages/ Other skills	**Specialization**: Bachelor's degree, Master's degree, Ph.D. Research and/or professional experience might be required **Language**: Greek and/or English **Other skills:** practical professional work experience , experience of writing and editing copy for communication material, knowledge of mobile and web space content management, ability to organise events addressing multiple national and international target groups, experience of environmental education programmes and interpretive activities, qualifications in environmental communication or other environmental qualifications, etc.
Number of positions for this employment	Unknown
Other issues	

Papaver rhoeas ©NHMC

Type of Employment 3: Description/ Objectives/ Place/ Duration (permanent, short term, hourly job)/Work development potential/ Other issues	Administrative staff **Objectives**: Administration, secretariat, events' organization **Duration**: permanent/short term
Skills requirements: Transcripts/ Specialization (MSc, PhD)/ Professional experience/ Research experience (publications, participation in conferences etc)/Teaching experience/ Languages/ Other skills	**Specialization**: Technical diploma, Bachelor's degree, Master's degree **Language:** Greek and/or English **Other skills:** professional work experience , experience of writing and editing, knowledge of mobile and web space content, ability to organize events, etc.

Number of positions for this employment	Unknown
Other issues	

Findings and conclusions

The staff of the non-governmental conservation and management organizations, societies and institutions for the protection of wild life and its habitats in Greece, and particularly the educational, communicational and public awareness staff might be taking up a growing role of importance when it comes to biodiversity issues and global climate change. These people are in regular contact with public, and due to the often informal and sometimes even exotic nature of their institutions, they might attract audiences that would not easily find their way to more formal bodies of knowledge. It also adds to their credibility to invest more in education concerning biodiversity and climate change, both for their own staff as well as for their visiting audience. As such, it would be sensible to invest in communication with these institutions, so that they are and remain fully aware of BIOTALENT.

PRACTICE 05 – Natural History Museums, Science Centres, Zoological gardens, Botanical gardens and Nature Reserves in Greece

Natural History Museums (NHMs) or **Museums of Natural History** are scientific institutions with natural history collections that include current and historical records of animals, plants, fungi, ecosystems, geology, paleontology, climatology, and more. The primary role of NHMs is to provide the scientific community with current and historical specimens for their research, which is to improve our understanding of the natural world. Many NHMs also aim at public awareness and sensitization as well as environmental education and training.

Science centers (SCs) or **Discovery centers** or **Science Museums** or **Technology Museums** are scientific institutions that emphasize science and technology through hands-on approach, featuring interactive exhibits that encourage visitors to experiment and explore.

Zoological gardens (ZGs) or **zoological parks** or **zoos** or **animal parks** or **menageries** are facilities in which animals are confined within enclosures, that often attempt to replicate their natural habitats or behavioral patterns, displayed to the public, and in which they may also breed.

Botanical gardens (BGs) or **botanic gardens** are gardens dedicated to the collection, cultivation and display of a wide range of plants labelled with their botanical names. BGs are often run by universities or other scientific research organizations, and often have associated herbaria and research programmes in plant taxonomy or some other aspect of botanical science. In principle, their role is to maintain documented collections of living plants for the purposes of scientific research, conservation, display, and education, although this will depend on the resources available and the special interests pursued at each particular garden.

Nature reserves (NRs) or **natural reserves** or **bioreserves** or **(natural/nature) preserves** or **(national/nature) conserves** are protected areas of importance for wildlife, flora, fauna or features of geological or other special interest, which is reserved and managed for conservation and to provide special opportunities for study or research. NRs may be designated by government institutions in some countries, or by private landowners, such as charities and research institutions, regardless of nationality. Nature reserves fall into different IUCN categories depending on the level of protection afforded by local laws.

Name/abbreviation of Key actor, Stakeholder or Enterprise related to biodiversity issues	In Greece there are numerous Natural History Museums, Science Centres, Zoological gardens, Botanical gardens and Nature Reserves, such as: • Natural History Museum of Crete-University of Crete (Μουσείο Φυσικής Ιστορίας Κρήτης Πανεπιστημίου Κρήτης) (http://www.nhmc.uoc.gr/en) • The Natural History Museum of the Lesvos Petrified Forest (**Μουσείο Απολιθωμένου Δάσους Λέσβου**) (http://www.lesvosmuseum.gr/site/home.csp) • Goulandris Natural History Museum (**Μουσείο Γουλανδρή Φυσικής Ιστορίας**) (http://www.gnhm.gr/en/the-museum/) • Zoological Museum of the University of Athens (**Ζωολογικό Μουσείο**) http://old.biol.uoa.gr/zoolmuseum/introden.htm • Natural History Museum of Axioupolis (**Μουσείο Φυσικής Ιστορίας Αξιούπολης**) (http://axioupolis.aegean.gr/en/index.php) • Museum of Natural History of Meteora & Mushrooms Museum (**Μουσείο Φυσικής Ιστορίας Μετεώρων και Μουσείο Μανιταριών**) (http://meteoramuseum.gr/en/) • Museum of Natural History of the Bee (**Μουσείο Μελισσοκομίας και Φυσικής Ιστορίας της Μέλισσας**) (http://www.mel.gr/en/content.asp?id=87) • Noesis – Thessaloniki Science Center and Technology Museum (**Κέντρο Διάδοσης Επιστημών** & **Μουσείο Τεχνολογίας ΝΟΗΣΙΣ**) (http://www.noesis.edu.gr/en/) • Museum of Science and Technology of the University of Patras (**Μουσείο Επιστημών και Τεχνολογίας Πανεπιστημίου Πατρών**) (http://old.upatras.gr/index/page/id/68/lang/en) • Museum of Typography (**Μουσείο Τυπογραφίας**) (http://www.typography-museum.gr/home-en/) • Hellenic Motor Museum (**Ελληνικό Μουσείο Αυτοκινήτου**) (http://www.hellenicmotormuseum.gr/en/) • The Attica Zoological Park (Αττικό Ζωολογικό Πάρκο) (http://www.atticapark.com/) • Cretaquarium (Θαλασσόκοσμος) (http://www.cretaquarium.gr/en) etc....
Public / Private	Public & private
Number of employees	Unknown

Brief profile of Key actor, Stakeholder or Enterprise	**NHMs and SCs** are places that make Nature and STEM Science accessible and encourage the excitement of discovery. They are an integral and dynamic part of the learning environment, promoting exploration from the first "Eureka!" moment to today's cutting-edge research. **ZGs, BGs** and **NRs** have to some extent overlapping functions that include the management, protection and displaying of endemic and exotic species of plants and animals. Many of these institutions also spend considerable effort into educating and informing their audiences about issues that affect many of the species on exhibit, such as global biodiversity loss and climate change.
Existing and New type of Employments related to biodiversity in the above Key actor, Stakeholder or Enterprise	
Type of Employment 1: Description/ Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Scientific staff (STEM scientists, environmentalists) **Objectives:** collection management, facilitate and organise scientific research, connect scientists with society, proposal and management of National/European/World Projects, assessment, co-ordination of environmental education programmes in co-operation with the relevant staff, etc. **Duration**: permanent/short term
Skills requirements: Transcripts/ Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/ Teaching experience/ Languages/Other skills	**Specialization**: Bachelor's degree, Master's degree, Ph.D. Research and/or professional experience might be required **Language**: Greek and/or English **Other skills**: Extensive knowledge of, and passion for nature (several organisms' spotting and identification, experience in field studies, knowledge of the biology of specific organisms, etc).
Number of positions for this employment	Unknown
Other issues	

Type of Employment 2: Description/ Objectives/Place/ Duration (permanent, short term, hourly job) / Work development potential / Other issues	Educational, communicational and public awareness staff (STEM educators, environmentalists, social scientists, awareness-raising officers, etc.) **Objectives:** receiving, assisting, educating and communicating with audience concerning fields and topics relevant to the particular institution; participate in, prepare for and organise public meetings and debates, write or assist in the preparation of brochures, newsletters, media articles, info leaflets, folders, reports, lobbying, co-ordinate the environmental education programme in co-operation with the relevant staff, participate in the content development and maintenance of SPP web and social media, etc **Extra training** might be needed **Duration**: permanent/short term/hourly job
Skills requirements: Transcripts/ Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/ Teaching experience/ Languages/Other skills	**Specialization**: Bachelor's degree, Master's degree, Ph.D. Research and/or professional experience might be required **Language**: Greek and/or English **Other skills**: practical professional work experience , experience of writing and editing copy for communication material, knowledge of mobile and web space content management, ability to organise events addressing multiple national and international target groups, experience of environmental education programmes and interpretive activities, qualifications in environmental communication or other environmental qualifications, etc.
Number of positions for this employment	Unknown
Other issues	
Type of Employment 3: Description/ Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Green space managers, technical staff **Objectives:** management and maintenance of collections and/or living specimens of flora & fauna, guidance of visiting public. **Duration**: permanent/short term

Skills requirements: Transcripts/ Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/ Teaching experience/ Languages/Other skills	**Specialization**: Technical diploma, Bachelor's degree, Master's degree **Language**: Greek and/or English **Other skills:** scientific background in animal care, a good fitness level, the will to learn more about animals each day.
Number of positions for this employment	Unknown
Other issues	
Type of Employment 4: Description/ Objectives/Place/ Duration (permanent, short term, hourly job)/ Work development potential/Other issues	Administrative staff **Objectives**: Administration, secretariat, events' organization **Duration**: permanent/short term
Skills requirements: Transcripts/ Specialization (MSc, PhD)/Professional experience/ Research experience (publications, participation in conferences etc)/ Teaching experience/ Languages/Other skills	**Specialization**: Technical diploma, Bachelor's degree, Master's degree **Language**: Greek and/or English **Other skills**: professional work experience , experience of writing and editing, knowledge of mobile and web space content, ability to organize events, etc.
Number of positions for this employment	Unknown
Other issues	

Findings and conclusions

The staff of Natural History Museums, Science Centres, Zoological gardens, Botanical gardens and Nature Reserves in Greece, and particularly their educational, communicational and public awareness staff might be very much interested in biodiversity issues and global climate change. These people not only are they in regular contact with public, but they also design, prepare and implement relevant educational material and activities, so they need to be up-to-date, concerning the knowledge about BIOTALENT's thematology. It also adds to their credibility to invest more in education concerning biodiversity and climate change, both for their own staff as well as for their visiting audience. As such, it would be sensible to invest in communication with these institutions, so that they are and remain fully aware of BIOTALENT.

GREECE

Key actor, Stakeholder or Enterprise	Existing and New jobs	Skill requirements	
		Existing and New jobs	New already implemented ideas for enterprises
Formal STEM education providers (Kindergartens, Primary & Secondary Schools, Universities, Polytechnics, Technological Educational Institutes and Academies)	Teachers, Educators, Professors	Bachelor's degree, Master's degree, Ph.D. Teaching, research, professional experience and specialisation	
Non-formal STEM education providers (Schools/Institutes of Vocational Training, Centers of Environmental Education, Centres of Life-long Learning, Colleges, etc.)	Educational staff	Bachelor's degree, Master's degree, Ph.D. Teaching and professional experience	
Informal STEM education providers (Educational Institutes, Museums, Science Centres)	Scientific and Educational staff	Technical diploma, Bachelor's degree, Master's degree, Ph.D. Teaching, research, professional experience and specialization Experience in theatrical play, story-telling, movie making, activities and crafts designing, cultural events, children communication, etc.	
Environmental Conservation and Management Societies and Institutions	Scientific, Educational, Communicational, Public Awareness, Technical and Administrative staff	Technical diploma, Bachelor's degree, Master's degree, Ph.D. Research and professional experience; extensive knowledge of, and passion for nature; experience of writing and editing copy for communication material, knowledge of mobile and web space content management, ability to organize events addressing multiple national and international target groups, experience of environmental education programs and interpretive activities, qualifications in environmental communication or other environmental qualifications, etc.	

Natural History Museums, Science Centres, Zoological gardens, Botanical gardens and Nature Reserves	Scientific, Educational, Communicational, Public Awareness, Technical, Green space and Administrative staff	Technical diploma, Bachelor's degree, Master's degree, Ph.D. Research and professional experience; extensive knowledge of, and passion for nature; experience of writing and editing copy for communication material, knowledge of mobile and web space content management, ability to organize events addressing multiple national and international target groups, experience of environmental education programs and interpretive activities, qualifications in environmental communication or other environmental qualifications, etc.; scientific background in animal care, a good fitness level, the will to learn more about animals each day.	.

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This booklet was prepared in the frames of the BIOTALENT project
http://biotalent.myspecies.info/

It is a report on national research conducted in all four project countries, in order to identify:
i) existing e-learning training seminars related to Taxonomy and Biodiversity, in connection with the labor market and
ii) skills of job seekers, necessary for the Biodiversity and STEM (Science, Technology, Engineering and Mathematics) labor market.

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