COMPASS: STANDARDS-BASED TOOLS AND SERVICES FOR BUILDING LIFELONG LEARNING PATHWAYS

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Abstract

COMPASS consists in the integration and extension of European standardization achievements in the field of learning opportunity and learning outcomes/competence information for the creation of models, open technology infrastructure and meaningful services within a higher education context that target (a) the improvement of quality and relevance of offered learning opportunities to current and emerging labour market needs, (b) the enhancement of mobility, making learning opportunities more visible and understandable for students that want to gain additional skills (c) the strengthening of cross-border cooperation of HEIs in the definition of quality flexible learning pathways for their learners, (d) the increase of social responsibility of HEIs through the transparent descriptions of their offerings, (e) the implementation of sustainable infrastructure for all European HEIs and for the EU to leverage in the enhancement of existing or the creation of new related services.

Abstract in Greek

Το COMPASS συνίσταται στην ενσωμάτωση και επέκταση των επιτευγμάτων της ευρωπαϊκής τυποποίησης στον τομέα των μαθησιακών ευκαιριών και των μαθησιακών αποτελεσμάτων ή/και δεξιοτήτων για τη δημιουργία μοντέλων, υποδομών ανοιχτής τεχνολογίας και σημαντικών υπηρεσιών εντός ενός πλαισίου εκπαίδευσης που στοχεύει: (α) στη βελτίωση της ποιότητας και της συνάφειας των προσφερόμενων ευκαιριών μάθησης στις τρέχουσες και αναδυόμενες ανάγκες της αγοράς εργασίας, (β) στην ενίσχυση της κινητικότητας, καθιστώντας τις ευκαιρίες μάθησης πιο ορατές και κατανοητές για τους σπουδαστές που επιθυμούν να αποκτήσουν πρόσθετες δεξιότητες, (γ) στην ενίσχυση της διασυνοριακής συνεργασίας των ΑΕΙ με τον καθορισμό ποιοτικών ευέλικτων οδών μάθησης για τους σπουδαστές τους, (δ) στην αύξηση της κοινωνικής ευθύνης των ΑΕΙ μέσω διαφανών περιγραφών των προσφορών τους, (ε) στην υλοποίηση βιώσιμων υποδομών για όλα τα ευρωπαϊκά ΑΕΙ και για την ΕΕ, ώστε να αξιοποιήσει την ενίσχυση των υφιστάμενων ή τη δημιουργία νέων συναφών υπηρεσιών.

Keywords: lifelong learning pathways, learning opportunities, learning outcomes and competences, learning technology standards

Introduction

The decade that we have embarked upon presents enormous challenges for Europe. The 2020 strategy for smart, sustainable and inclusive growth recognises the key role higher education must play if the ambitions for Europe in a fast-changing global reality are to be realised (Eurydice, 2011). This implies widening access to lifelong learning to as many European citizens as possible and it is vital that measures are implemented to transform our reality towards this direction. Notably, labour markets increasingly require more graduates with specialized knowledge and competences and substantial investment has to be made in education systems to ensure that this demand is met.

According to the fundamental goal of the ET 2020 WP: "Making lifelong learning and mobility a reality", economic, technological and organizational changes impose new demands for a Europe more responsive to the labour market's requirements. Therefore ET systems have to be able to support and equip European citizens with knowledge, skills, and competences to fulfil three core objectives:

- meet the challenges of globally increasing competition;
- generate new skills to respond to the nature of the new jobs and
- improve the adaptability and employability of adults already working or entering the labour market.

It is accepted that among the key reasons that deter people from participating in Lifelong Learning activities are: (a) the lack of meaningful, well-structured, easily accessible information related to lifelong learning related information, and (b) the lack of policy frameworks and tools for linking competences and qualifications gained across different phases and contexts inside and outside formal education and training, in order to form flexible pathways for personal development and competitiveness in the labour market.

As emphasized in (Commission Staff Working Document, 2012), flexible pathways have an important potential for encouraging participation in lifelong learning; thus, an alternative approach is required in order to attract stakeholders, i.e. learning opportunity providers, individuals, policy-makers and technology developers, to engage in the process of building an ecosystem for managing and promoting flexible, alternative Lifelong Learning Opportunity pathways.

Under this perspective, the COMPASS project aims to the Composition of Lifelong Learning Opportunity Pathways through Standards-based Services investing on the establishment of a cohesive, strategic partnership for the long-term promotion of LLL-related European strategies and the development of instruments that will raise the awareness of both learning opportunity providers and learning opportunity seekers and stimulate the design of policies for enhancing ET with alternative, flexible pathways on the basis of easy, technology-enhanced access to learning opportunities.

The proposed approach targets all types of LLL stakeholders with a specific emphasis in a higher education context. More specifically, COMPASS:

- promotes the concept of flexible lifelong learning pathways through the use of guidance instruments and produce policy suggestions for fomenting their implementation by higher education institutions;
- develops standards-based technical tools to engage HEI learning opportunity providers in producing well-structured, competence-based Learning Opportunity descriptions and in supporting the creation of flexible learning paths, thus improving the quality and relevance of higher education to current and emerging labour market needs;
- leverages the consortium's significant impact and span to policy makers, collaborating HEIs and to ICT-related industry, to design and implement pilot tests, that will boost awareness and institutional commitment;
- makes explicit contributions for integration of technical developments into existing European and national guidance instruments for access to learning opportunities (e.g. Ploteus).

The ICT sector has been selected as our pilot application field since, according to (Commission Staff Working Document, 2012), there is a persistent mismatch between supply and demand of ICT skills, while there will be up to 700,000 unfilled ICT practitioners' vacancies in the EU by 2015. Furthermore, ICT is one of the most rapidly evolving fields; knowledge provided a couple of years ago, today may render useless under the light of the needs of the current market.

The partners that constitute the COMPASS consortium are:

1. Technological Educational Institute of Athens (TEIA, GR) (Coordinator);
2. Technische Universiteit Delft (TUD, NL);
3. Université de Montpellier (UM, FR);

4. National Quality Infrastructure System (NQIS, GR);
5. Consorzio Interuniversitario Nazionale Per L'informatica (CINI, IT);
6. Universidad Carlos III de Madrid (UC3M, ES);
7. Tallinna Tehnikaulikool (TUT, EE).

Previous work

COMPASS builds around (a) the modelling of well-structured representations of Learning Opportunities with explicit integration of learning outcome and competence related information and (b) implementation of technology-enhanced, flexible learning pathways.

These concepts have been tackled within policies and some of their integral parts have been the object of modelling, technical standardization work and implementations.

The innovation of this project consists in the integration and extension of previous related work for the creation of meaningful services within a higher education context that target (a) the improvement of quality and relevance of offered learning opportunities to current and emerging labour market needs, (b) the enhancement of mobility, making learning opportunities more visible and understandable for students that want to gain additional skills (c) the strengthening of cross-border cooperation of HEIs in the definition of quality flexible learning pathways for their learners, (d) the increase of social responsibility of HEIs through the transparent descriptions of their offerings, (e) the implementation of sustainable infrastructure for all European HEIs and for the EU to leverage in the enhancement of existing or the creation of new related services. The following initiatives constitute a basis for the COMPASS work:

- EN 15982:2011Metadata for Learning Opportunities;
- CWA 16655:2013 Integrating Learning Outcomes and Competences;
- Ploteus;
- XCRI-CAP.

Aims and Outputs

The COMPASS Description of Work is structured into five Intellectual Outputs (IOs) as follows:

Lifelong Learning Opportunity and Pathway Models

This output correlates to the adoption and extension of the EN15982 MLO European Standard with learning outcomes and competence-related information, for the development of a metadata structure to represent and describe HEI Learning Opportunities.

Initially, the partners will investigate and present the existing organizational and technological structures for learning opportunity exploration (Ploteus, the XCRI implementation) and present the underlying information model.

Next, the work undertaken by project partners will focus on the creation of an information model for representing metadata concerning lifelong learning opportunities in the ICT domain, documented in a way easily transferable and adopted to other domains. The information model and associated metadata application profile will specify how a solid infrastructure can be deployed for the support and delivery of lifelong learning opportunities through IT systems and the development of services for opportunity exploration and pathway planning thus facilitating personal development and enhancement of employability.

A methodology for describing learning opportunities in such a way that they are reusable and sharable across different domains, educational levels and contexts will be described.

This methodology will present a set of *design patterns* for the creation and structure of metadata, as well as a quality-controlled process for creating new patterns and further evolve existing ones.

Online Services

The main purpose of intellectual output O2 is to provide an evidence of the validity of the suggested metadata instruments and approach, along with a showcase of the effectiveness of the developed metadata structure for the efficient adoption of standards-based metadata representation of Lifelong Learning Opportunities.

In particular, the core objective of O2 is to transfer the systems architecture design and associated metadata application into a set of software components and services that can allow and facilitate the exploration of alternative lifelong learning opportunity pathways. In order to meet this goal, a software toolkit has been developed that will be available to interested organizations in order to develop their learning opportunity structure based on a competence enhanced Metadata for Learning Opportunities (MLO).

Furthermore, an online repository of MLO-based structures has been setup, which will facilitate the *design patterns* template and will be regularly updated with descriptions and insight from the usage of standards in metadata development in the ICT domain as well as suggestions for transferring to other domains. Both the developed toolkit and the metadata repository will be adopted for the targeted ICT domain.

The specific objectives are:

- to illustrate how different and diverse software applications can be developed using the proposed metadata architecture and infrastructure; and
- to create awareness and prepare case studies and guidelines for other software developers that would like to connect and re-engineer existing systems and services or build new ones for compliant applications in any sector. Therefore, COMPASS has been working towards the development of:
  - a software component for description of learning opportunities, to be made freely and publicly available to learning opportunity providers,
  - a free service for lifelong learners to leverage information about learning opportunities for building desired pathways for personal development.

The main objective is to transfer the systems architecture design and associated metadata application into a set of software components and services that can allow and facilitate the exploration of alternative lifelong learning opportunity pathways. In order to meet this goal, COMPASS Repo has been developed that will be readily available to interested organizations in order to develop their learning opportunity structure based on a competence-enhanced Metadata for Learning Opportunities (MLO).

Furthermore, the COMPASS Repo facilitates the *design patterns* template and will be regularly updated with descriptions and insight from the usage of standards in metadata development in the ICT domain as well as suggestions for transferring to other domains. Both the developed toolkit and the metadata repository will be adopted for the targeted ICT domain. The repository has been developed, tested, staged, and deployed at: http://195.130.109.197:8080/jspui/

Tested and Populated Online Services

This Output comprises the technical and user-based evaluation validation activities that will take place during the lifecycle of the project. Two pilot deployment periods are planned: a period focusing on the organization of controlled trials, and a period focusing on the organization of public demonstrators.

During those deployment periods, two rounds of user-oriented testing are planned to systematically collect and analyse feedback from target user groups and ensure that the results are fed into the technical work allowing for improvement and refinement of the underlying components and/or frameworks.

During the first period, controlled pilot trials will take place, where groups of end-users will be invited to try the toolkit and the service and provide their feedback. During this period, the partners will utilize the toolkit developed in O2 to represent the learning opportunities they provide.

During the second period, the COMPASS partners will invite stakeholders working in relevant areas to use the corresponding deployed services and provide feedback. In addition, open public demonstrators will be organized, where the concepts of COMPASS and associated services will be heavily promoted and advertised to target user communities through relevant online channels and mailing lists. Thus the national workshops will promote the dissemination and awareness of the COMPASS approach.

An evaluation report will summarize the results from all evaluation events and activities. In addition it will suggest improvement procedures for the corresponding project results, which will be generalized to put forward a set of guidelines and recommendations for transferring the COMPASS results to other sectors and countries.

MOOC on Standards-based LO Descriptions and the Online Service

A Massive Open Online Course (MOOC) is a *Web-based distance learning program*, which facilitates the involvement of vast amount of learners from different locations. MOOCs have been started in 2008 and since then they have been evolved in a fast pace. With MOOCs, teaching has changed from unpredictable and conducted in confined spaces, to an open record that is permanently accessible to the whole world.

This output regards the production of a collaborative Massive On-line Open Course. The COMPASS MOOC will offer trainees valuable, validated, readily applicable competences and skills, within a highly motivating and flexible environment. The course will be available in seven languages (EN, GR, ES, NL, ES, FR, IT) via the EdX MOOC open source platform. The MOOC that will be developed on the context of COMPASS will constitute of two parts. The first part will concentrate on the subject of Standards-based Learning Opportunity descriptions. The second part will concentrate on the developed services and tools.

Recommendations for Policy and Standardization Development

The Policy Suggestions report document will contain all lessons learned during the application of COMPASS integrated awareness-raising strategy. Specifically, the impact of the activities and the response to the strategy, in terms of public participation, will be elaborated in order to produce suggestions on how this integrated approach can evolve to national strategies of public awareness-raising regarding LLL themes, as well as adoption of alternative lifelong learning pathways. In the case that weaknesses are observed to the strategy during the project lifetime, they will be assessed and analysed in order to provide alternative solutions. The document will refine suggested policies into measures applied for supporting LLL initiatives as well as adoption of alternative lifelong learning pathways and increasing its popularity and public penetration.

Current Status of the COMPASS Project

COMPASS is a 36 months (3-year) project funded by the European Union under the ERASMUS+ funding tool. The project started on September 2015 and is expected to complete on August 2018.

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