

# Cross-curricular project-based learning approach fostering competences

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## Abstract

The key competence acquisition by every young person is one of the long term objectives of the updated strategic framework for European cooperation. Most of the EU Member States are formulating and at least beginning to implement policies that move their school systems from being predominantly input led and subject-oriented towards curricula which include competences, cross-curricular activities, active and individual learning, as well as a focus on learning outcomes. Yet, these developments do not necessarily result in significant, widespread changes in practice – that is, in how schools actually organise and provide learning experiences for pupils. The difficulty is in all cases translating these policies into practice. TRANSIt is a European project that aims to contribute to the enhancement of transversal key competences of students through building teachers capacity for competence oriented education. This paper presents the outcomes from the needs analysis survey on key competence acquisition in Greece, as well as the design and localisation of the TRANSIt Training Framework and environment based on the collected responses and the specifications set from the Greek Curriculum.

**Keywords:** Competences, project-based learning, transversal competences, assessment, ePortfolios

## Introduction

Key competence acquisition (KCA) is one of the long term objectives of the updated strategic framework for European cooperation (Official Journal of the European Union, 2009). The concept of key competence originated with the adoption of the Lisbon Strategy in 2000 and it resulted in the European Reference Framework (European Commission, 2006). Key competences in the EU framework are those that ‘all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment’. The Framework identifies and defines eight (8) key competences:

1. Communication in the mother tongue;
2. Communication in foreign languages;
3. Mathematical competence and basic competences in science and technology;
4. Digital competence;
5. Learning to learn;
6. Social and civic competences;
7. Sense of initiative and entrepreneurship;
8. Cultural awareness and expression;

The last five (5) competences are considered transversal. Most of the EU Member States are beginning to implement policies that move their school systems from being predominantly subject-oriented towards curricula which include competences, active and individual learning, as well as a focus on learning outcomes. One such example is Greece, where in the school year 2011-2012, pilot curricula for competence driven education have been introduced. In Austria however, the promotion of holistic teaching methods has been supported at policy level for several years. In other countries (e.g. France, Netherlands)

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innovative policies are already embedded in national strategy documents and in some cases these have already led to major structural changes, such as the introduction of new qualifications frameworks or the reform of the curriculum around the Key Competences (European Commission, 2009a). In general, there are a variety of different models of competences in European countries (European Commission/EACEA/Eurydice, 2012).

Yet, these developments do not necessarily result in significant, widespread changes in practice – that is, in how schools actually organise and provide learning experiences for pupils. The difficulty is in all cases translating these policies into practice. One of the core problems for the effective implementation of the above policies is the lack of initial education and training, as well as systematic support of teachers. One more obstacle regarding KCA is the lack of effective assessment practices. Assessment of competence is one of the vehicles that can be used to support teachers in making this paradigm shift (Black & William, 1998). This places new demands on the competences of teachers and trainers and therefore on the structure and content of initial and continuing teacher education (European Commission, 2009b). “TRANSIt - TRANSversal key competences for lifelong learning: Training teachers in competence based education” approach aims to support teachers at bridging the gap between policy and practice on a European scale.

In this paper we present the overall aims and methodological approach of the “TRANSIt” project, the current state of Competence-Based Learning (CBL) policy and practice in Greece, the results from the needs analysis study in Greece, as well as the design and localisation of the TRANSIt Training Framework and Environment based on the collected responses and the specifications set from the Greek Curriculum, with the goal to deliver an effective training programme for teachers.

### TRANSIt project

The aim of “TRANSIt” project is to have a positive impact on the development of students’ competencies by building teachers capacity, in line with the EU objectives; thus prioritising the improvement and quality of teacher education to have a direct effect upon levels of students KCA (Official Journal of the European Union, 2007). To achieve this, a pilot teachers training methodology is developed on the didactics and e-assessment of key transversal competences. The methods of the project are founded on a holistic view of students learning, going beyond subject boundaries and finding application in a wide spectrum of curriculum subjects. The TRANSIt approach contributes to the development of creativity, intercultural and multilingual competences, social development, and “learning to learn” competences. TRANSIt aims to contribute towards the improvement of the quality of competence education by improving teachers’ awareness and professional skills regarding the didactics and e-assessment of the key competences with the use of ePortfolios, and supporting them to bring European and national policies into practice.

The overall approach taken towards delivery of the training is based on the methodological principles of participatory design with the user groups in the development of the training framework. To this end, stakeholders’ needs analysis was performed in order to identify the obstacles in the process of introducing new approaches in teaching practice and to identify enablers that will effectively support such interventions. The training programme includes cycles of school - centered activities aimed at getting teachers feedback about their experiences gained in the classroom during the implementation of the proposed activities.

## Current state of Competence-Based Learning in Greece

In this section we focus on specific aspects about current policy and practice regarding Competence Based Learning (CBL) activities in Greece. CBL activities are defined here as educational activities aimed to students' KCA. First, we give an overview of the features from the educational system that may have an impact in current practice of CBL. Then, we explain the results of the needs analysis.

### *Policy*

The method by which competences have been introduced in the education system varies among countries. Some have introduced these approaches through adaptations of the curriculum, whilst others have done it through legislative change (Gordon et al., 2009). Greece is such an example, where in the school year 2011-2012, pilot curricula for competence driven education based on the National Life Long Learning Strategies for the 'New School' of the Greek Ministry of Education, Life Long Learning and Religious Affairs have been introduced (<http://dschool.edu.gr/>).

### *Needs analysis of Competence-Based Learning from teachers in Greece*

This section aims to present the feedback provided by the target groups of the project from Greece (teachers (in-service, pre-service), teacher trainers, educational policy makers) in the online survey. LimeSurvey was used for the online Greek questionnaire aimed at identifying the profiles of the possible participants in TRANSIt training activities, the current implementation of competence-based didactics and assessment, as well as participants training needs. The link for the survey was made available through the etwinning mailing list by the National Contact Service, CTI Diophantus. In the survey 648 responses were collected. The survey is analytically presented in Riviou & Sotiriou (2013).

### *User profile*

From the participants, 196 (30%) were men and 452 (70%) women with the majority in the age range of 41 to 51 years old. Respondents are mostly teachers in secondary education (74,80%) and primary education (48,60%). The next group of participants with highest representation are School leaders (11%), Teachers' trainers (10,40%), Pre-service Teachers with percentage of 3,60%, Curriculum developers and Educational Policy Makers (1%), each, whereas other roles were 3,40%. The majority of respondents have a more than 15 years' experience in their profession. Regarding usage of ICT, the highest percentage defines themselves to be "Enthusiastic on the use of ICT" (56,64%), while those claiming to have taken part in continuing professional development (CPD) activities on the theme of competence acquisition was (55,25%). There is a wide and varied spectrum of training activities, mostly around technology enhanced learning; Level 1 "In-Service Training of Primary and Secondary School Teachers on Information and Communication Technology (ICT). Basic Skills in Education", Level 2 "Teachers' Training in the Use and the Exploitation of ICT in the Educational Teaching Process", use of Web2.0/social media tools, training for implementing projects, and creative drama activities/creativity techniques.

### *Current implementation of didactics and assessment of key competences*

Throughout the survey, participants reflected on their own competence on teaching and assessing transversal key competences. Participants feel most confident about teaching digital competence (49%). Additionally, a great percentage of participants mention the

collaboration with colleagues for the design and implementation of cross-curricular projects, as crucial factor. Regarding the assessment tools/methods that teachers mostly use ePortfolios and Rubrics have the lowest levels of use with percentages of 57% and 52% respectively. In general, teachers report a lack of knowledge about competence-based assessment techniques. This means that teachers mostly perform concept-based evaluation.

#### Limitations of school practice/Curriculum opportunities for applying CBL

Participants spot several constraints to the systematic implementation of transversal CBL activities. They feel their working schedule doesn't allow for the educational innovation they would like, the most frequent answer being time constraints. The low availability of resources and a very limited flexibility to use them has also been mentioned among the biggest barriers encountered. Given the constraints, participants identified enablers to the implementation of CBL activities. As participants indicated CBL is usually implemented in the classroom and not in extra-curricular activities. A percentage of 23,55% indicates that CBL is usually implemented by running projects with their students.

#### Training needs

Data collected on training needs is consistent with the current implementation of CBL. The most important item is "Didactics and teaching methods" and most particularly regarding the themes applied throughout competences: critical thinking, creativity, initiative, problem solving, risk assessment, decision taking, and constructive management of feelings. The second most required training need is competence-based assessment. Participants are particularly interested in learning about specific tools to assess competences. Regarding the activities/methods to be incorporated in training workshops, participants expressed their high interest primarily for Demonstrations of tools and instruments (60,80%), Practical assignments (56,20%) and then Examples of good practices (53,90%), demonstrating the need to undertake hands-on training.

#### TRANSIt Training Framework

The *TRANSIt Teacher Competency Framework* defines the criteria from which it will be possible for a teacher to determine how competent they are in didactics and e-assessment of transversal key competences (using rubrics). A competence framework is a model that broadly defines the blueprint for 'excellent' performance within an organisation or sector. The frameworks that influenced its design were the UNESCO ICT Competency Framework for Teachers (United Nations 2011) and the Western Australia Teacher Competency Framework (Western Australia, Department of Education, 2009). The TRANSIt Competency Framework comprises of four dimensions and three stages. The four dimensions are:

1. Facilitating Student Learning
2. Assessing and Reporting Student Learning Outcomes
3. Engaging in Continuing Professional Development
4. Establishing Partnerships and Collaborations.

Each dimension describes the generic characteristics of teachers' work that are central to their professional effectiveness. Within these dimensions are indicators of effective practice, which are competency-related professional actions.

Competency standards are concerned with application of professional knowledge and skills within the workplace and are underpinned by teachers' professional values. Each competency standard is a statement of the level of competency a teacher exhibits for that dimension. In the TRANSIt Training Framework there is a qualitative scale for every

competence. Professional excellence in the context of competence-based learning involves teachers engaging in all dimensions.

Each stage identifies standards in the use of skills, knowledge and attitudes/values according to the dimension being used by the teacher. These elements are interrelated in the way teachers operate in their day-to-day teaching in classrooms. The framework is designed with each stage requiring more complex standards of attainment. The work and activities of teachers at any given time helps them identify the competence stage they are at. This framework views teachers' work as a continuum of practice. Teachers at any stage in their career may operate in different stages or parts of all stages. As teachers identify areas for improvement in particular competencies, it is recommended that they seek CPD to address a specific competency or part of a competency, visiting the respective areas of the TRANSIt training course.

Moreover, based on the needs analysis survey the TRANSIt Training Framework has been designed in a modular format, so that it can be localised. The approach is inspired by constructivist methodologies. Teachers taking the course or course modules will be handled as learners participating in authentic learning activities; also creating and using e-Portfolios as part of their learning process. This is supported by the tools and features of the TRANSIt learning environment. A combination of open source tools has been chosen; Moodle for delivering the TRANSIt training resources (Fig. 1) and Mahara as eportfolio tool. In addition, collaboration is supported as teachers have access to the Open Discovery Space (ODS) portal to access and publish learning resources and competence based learning scenarios created in the course of the TRANSIt program.

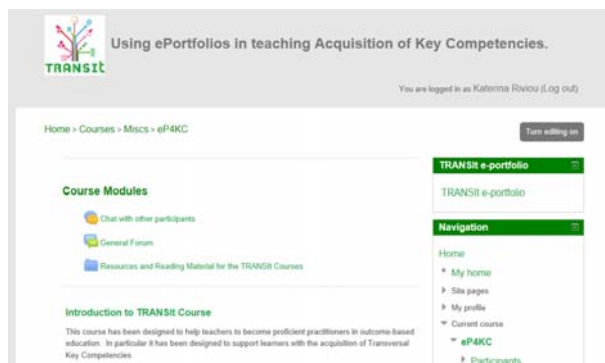


Figure 1. TRANSIt training environment (<http://transit.cti.gr/moodle/>)

The TRANSIt approach towards supporting teachers in designing learning scenarios is to provide exemplar templates or descriptions which can be shared, re-used and adapted to different contexts. Below follows the description of the project-based learning template, that is suggested to be used, as well as the assessment procedure.

### *The project-based learning template*

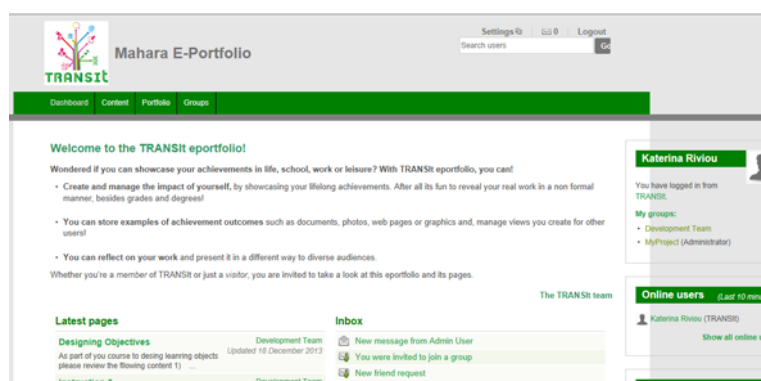
Competence based learning requires an approach to education that differs from the traditional approaches to teaching. The emphasis is to a lesser extent on transferring knowledge. In competence based education one tends to think of powerful or rich learning environments that enable students to engage in meaningful learning processes. According to

our interpretation of CBL the ideal teaching approaches are project based learning or experiential learning combined with authentic means of assessment.

In the context of COSMOS and ODS projects, with an aim to support teachers document and exchange their practices, templates have been created for different teaching approaches and pedagogical models, among them the “project-based learning” (Sotiriou, et. al, 2011; Hatzilakos, et. al, 2013). The template has been developed from an analysis of the state-of-the-art, and more specifically the Learning Activity Reference Model (LARM), so as to ensure maximum consistency with regard to the constituent elements and the metadata needed for indexation. The specific template is slightly adapted, and is suggested to be used by teachers in the context of TRANSIt project (Riviou & Kouroupetroglou, 2014).

### *The assessment*

Regarding assessment in order to be authentic, TRANSIt proposes the use of eportfolio with a rubrics combination, in two levels, in teachers’ training, as well as for the classroom practice. Eportfolios is a means where learners might collect the evidence of their choice in order to demonstrate the achievement of the educational goals and desired competences. Rubrics are suggested for peer and self-assessment. Teachers are trained and supported to use the Mahara eportfolio tool with their students working on projects, e.g. upper secondary school as set by the curriculum (Fig 2).



**Figure 2. Mahara to be used for teachers’ training in TRANSIt, as well as students’ projects in Upper Secondary School, <http://transit.cti.gr/mahara/>**

Mahara may be used by students in order to keep their journals, upload their group meetings, reports, presenting the topic, goals, procedures for collecting and processing data, conclusions and reflection of the group about collaboration between members, as well as any artifacts produced during their implementation of projects towards their final public presentation (film/documentaries, poster, hand-crafts etc.) Rubrics are suggested to be used by teachers for evaluating the teams, as well as students’ eportfolios and activities, according with the guidelines set by Matsagouras (2011). Learners need to be informed from the beginning about the goals, the success criteria and standards they need to meet, as well as participate in the formation of these criteria themselves (rubrics).

## Conclusion and recommendations

In general, the EU is prioritising the improvement of the quality of teacher education so as to have a direct effect upon levels of students' acquisition of competences. Therefore, the professional development of teachers and their training is a key requirement for the way forward (European Commission, 2010).

Our needs analysis confirms that, given the limitations imposed by the official curriculum in Greece, teachers are generally motivated to make a paradigm shift towards competence-based teaching. This is indicated by the high percentage (95%) of participants in the needs analysis study that have provided their contact details in order to be informed about the project's training and piloting activities.

The profile of the participants demonstrates that there is a strong interest especially by secondary education teachers to get trained and exchange practices within peer networks and communities of practice. This is aligned with the literature findings that the situation is even worse for teachers of secondary education since their training has not prepared them for the most part for holistic methods and cross-curricular teaching, although primary teachers may have more expertise in multidisciplinary CBL approaches (European Commission, 2009a).

The preference of teachers and head teachers to learn primarily from demonstration of tools and instruments, practical assignments and examples of good practices, demonstrates the need of stakeholders to undertake hands-on training, and that teachers need support in their everyday practice). This can be explained since they probably face difficulties in translating the policy into teaching practice, especially when they don't have the proper underpinnings. Participants also express the need to get trained regarding competence based assessment. TRANSIt training framework and environment designed based on participants' needs and requirements has been presented. TRANSIt environment has been designed with use of open source tools (Moodle, Mahara), as well as the Open Badge Infrastructure, as a mechanism for accrediting teachers in their community. TRANSIt training content includes specific examples/good practices and tries to address the training needs with an emphasis on assessment methods and tools, also by taking into consideration European reports (Redecker, 2013), as well as the national context requirements set by the Greek Curriculum.

The key to effective professional development is finding a way to organise qualified teachers, so they can collaborate with their colleagues. Collaboration and exchange of practices needs to be encouraged through training, let alone since participants refer to the benefits of collaboration with colleagues. TRANSIt has created a respective community of practice, where teachers are able to exchange and co-create their cross-curricular educational scenarios on the ODS portal: "TraIning teachers in competence based education: TRANSIt". All interested stakeholders are kindly invited to register and have access to the cross-curricular scenarios designed by peers.

The impact of the TRANSIt training materials will be assessed by authentic assessment methods analysing qualitative and quantitative characteristics of user-generated open educational resources (OER) content uploaded in the TRANSIt e-portfolios environment.

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