Teaching and Learning Foreign Languages with Interactive Methods

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Abstract

The use of ICT in European Schools has increased over the last decade but there is still room for improvement. Also interactive technology is often used below its technical and pedagogical potentials. The pedagogical potential of interactive technology in classrooms has not yet reached classrooms in different countries and in a substantial way. To develop these materials cooperation between educational researchers and teachers from different backgrounds is necessary.

This paper gives insight into a project work in the field of developing and implementing interactive teaching materials for several disciplinary areas in primary and secondary schools in European cooperation.

INTACT project brings together experts from science education, mathematics education, social science education and foreign language education – with a focus on bilingual education – and teachers in secondary and primary schools to develop a variety of pedagogically qualitative interactive teaching and learning resources.

Keywords: interactive teaching and learning resources, bilingual educational settings, cooperation and collaboration, CLIL, online platform

1. Introduction

INTACT - *Interactive teaching materials across culture and technology*- develops cooperative and collaborative teaching and learning resources that can be applied for CLIL (Content and Language Integrated Learning) instruction and, through the use of an online platform, are made available over cultural borders.

The scientific approach in INTACT is based on educational research or action research. The experts develop based on current –scientifically approved – educational approaches specific learning scenarios and materials. These scenarios and materials are tested in 'real life' classrooms, evaluated and improved. The continuing peer review processes of all involved partners ascertain the quality of the scenarios and materials as well.

The project addresses the secondary schools' need for reliable interactive resources, to be used in Science, Mathematics and Social Science classrooms in CLIL educational settings. Environmental issues and intercultural questions are also focal points for the development of the interactive resources.

The main requirements for the development of the interactive teaching resources are as follows: interactivity, compatibility and independence from specific technology, easy access, bilingual and intercultural aspects, social and collaborative learning as well as flexibility and adaptability.

The INTACT-consortium consists of six higher education institutions from different European countries: University of Education, Ludwigsburg (Germany), Universidad Complutense Madrid (Spain), Kecskemét College (Hungary), St. Patrick's College, Dublin (Ireland), Polytechnic Institute of Bragança (Portugal), Babes-Bolyai University, Cluj (Romania).

2. Scientific and research background of the project at the Hungarian partner

The scientific basis of the project is the results of mediapedagogical researches on international and national field. We mention firstly the project *iTILT* (*Interactive Technologies in Language Teaching*). The project provided results of interactive teaching methodology with technology for different languages, proficiency levels and age groups from seven European countries, helping teachers gain confidence with technology in communicative language teaching. We have to mention the results of the project EuSCRIBE too. The members wrote the Guidelines for effective school/classroom use of interactive whiteboards.

Kecskemét College Teacher Training Faculty as the research center of INTACT-project in Hungary and Kecskemét Calvinist Primary School as the practice school of the project have been taking part in various European projects aiming at promoting and developing foreign language competences that are relevant to INTACT.

One of the previous projects that can be regarded as a point of departure is Pri-Sec-Co. The project (Pri-Sec-Co - Primary and Secondary Continuity) had as its main aims and objectives to raise awareness for the problem of transition among the teachers and teacher trainers, exchange experiences, collect models of good practice and design bridging tasks in the field of FL which could facilitate transition between the two educational levels. Furthermore, the project aimed to design teacher training courses on the subject of transition (Lipóczi 2011).

As an outcome of the project bridging tasks were developed to be used to facilitate the transition from primary to secondary school. The bridging task from Hungary was „Buildings and activities in my town" designed for pupils learning German as a foreign language in the primary and the secondary level.

The other project in the field was MOLAN „Network for the exchange of information about good practices that serve to motivate language learners". MOLAN had the goal of exploring, analyzing and then making accessible to large public examples of successful initiatives in the field of language learning within primary and secondary schools. Kecskemét Calvinist Primary School represented the only good practice from Hungary within this project. This school initiated bilingual education using CLIL method, which was in the focus of an Erasmus program, CulTiFoLa as well. The school was asked by Gáspár Károli University (the Hungarian partner of the program) to function as the practice school of the international students involved in the program (Szabó 2012). Taken all this research and project background into consideration, the Hungarian partner of INTACT-project meets all the requirements of the project.

3. Methods and objectives

The scientific approach in INTACT is based on educational research or action research. Experts in their fields i.e. science education in primary schools develop based on current – scientifically approved- educational approaches specific learning scenarios and materials. These scenarios and materials are tested in real life classrooms, evaluated and improved. After the evaluation proves the scenarios and materials are working well, they will be published and made available for everybody to use.

The continuing peer review processes of all involved project partners ascertain the quality of the scenarios and materials as well.

Interactive, CLIL teaching and learning resources for various subjects are created during the project's duration. Educational resources are developed for the following disciplines: Biology, Geography, Civilization, German as a Second Language, Mathematics and Engineering. A wide spectrum of cooperation for schools by communication and collaborative work with the use of interactive materials will be achieved on regional, national and international levels facilitated by an INTACT online platform.

The main topics/requirements for the development of the interactive teaching resources are as follows: interactivity, compatibility and independence from specific technology, easy access, bilingual and intercultural aspects, social and collaborative learning as well as flexibility and adaptability.

Target groups and users of the interactive teaching and learning resources are teachers and students in primary and secondary schools with bilingual instruction (CLIL). Each partner cooperates with at least one pilot school. Researches of the partner institutions and teachers of the pilot schools develop the concepts for the teaching and learning resources cooperatively. In a subsequent phase the resources will be tested at the pilot schools and, with consideration of the results, will be revised accordingly.

The project is divided into four main working areas. Each area corresponds to one of the project's main themes and consists of individual working packages. Essential and comprehensive project decisions are discussed in the steering group, which includes the national leaders of each partner. In addition to the entire project's project management and the steering group, three other project groups exist. One or two project partners, so called group leader, manage each of the groups. The group leaders are also responsible for the included workpackages.

Group 1 (WPs 3 & 4): All aspects of dissemination and exploitation of project results are assigned to the first group. This includes design and implementation of the logo, website, flyer, and advertising materials for the project. In a further step, the results, among other things, will be provided in the form of an e-book, handbooks and glossaries as well as presented and distributed to events and conventions. The Polytechnic Institute of Bragança (Portugal) is responsible for this area of operation and the corresponding project group (Group 1).

Group 2 (WPs 5, 7 & 9): The second project group is responsible for three work packages. These three work packages correspond to three work phases during the duration of the project. The project group work includes all aspects that have to do with teaching and learning resources. This concerns conceptualization and implementation of teaching and learning resources. This part is managed by both St. Patrick's College, Dublin (Ireland) and the Babes-Bolyai University Cluj (Romania). Later on there will be tests with follow-up evaluations and, resulting from this, a revised version of the implemented teaching and learning resources. Responsible partners for these activities are Kecskemét College (Hungary) and the Universidad Complutense Madrid (Spain).

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The development of the INTACT teaching and learning resources as well as the educational requirements for the online platform were sequentially processed in a stepwise, collaborative procedure:
1. Deduction of a theoretical framework for the INTACT teaching and learning resources and activities.

2. Construction of templates for the description of the INTACT learning objects, lessons and learning units.

3. Description of the intended goals and the expected learning outcomes as fundament for the evaluation.

The first step for the development of the INTACT teaching and learning resources and for the online platform was an intensive discussion to find a common understanding of (i) the educational setting for the introduction of the INTACT approach

(ii) the theoretical, evidence-based framework for the development of interactive and collaborative learning/teaching resources. A result of this first work package was a short-paper as review of the theoretical background and a template for the theory-based development of the diverse INTACT

resources in the different related subjects on a primary or secondary school level The second step, the construction of a common template for the description of the INTACT resources, was the result of an intense and partially contentious discussion due to the different cultural and scientific background of the partners in group 2.

The description of the INTACT resources is threefold:

a) Learning objects (LO): As basic component of the INTACT resources, the Los are single digital objects to foster one specific aspect of a topic, e.g. an interactive animation of the human circulatory system, a simulation of the human visual perception under different light conditions or a hypermedia learning environment to discover the life of nocturnal mammals including different format like video, interactive maps or audio-files for primary education. Each learning object is described based on the LOM standard.

b) Lessons: The LOs are included into a lesson. Within the INTACT framework, the lessons are based on a socioconstructivist understanding of learning which fosters a dialogic knowledge and active construction. The description of the lesson plans follows an international standard.

c) Learning units: in most of the cases the lessons are part of a learning unit. The description outline, the intentions of the learning unit, its goals and central educational approaches.

The INTACT teaching and learning resources are developed to be used as learning units, but teachers can also use single LOs as part of their teaching.

All resource descriptions allow setting up a database on the INTACT platform that allows an easy access to the materials including a powerful search engine. Furthermore the INTACT platform will allow a teacher to organize the LOs individually to create, for instance, different micro-modules for heterogeneous classes to provide resources for different abilities.

Recently the following concepts for INTACT resources have been described and partially realized:

☐ Biology: Immune System; Circulatory System
☐ Civilization: Legends and Heroes (To be a knight in King Arthur's Court)
☐ Geography: Climate elements and factors
☐ German as a second language: Mozart als Kind und seine Reisen
☐ Primary Science: Creatures of the night; Magnetism
☐ Mathematics: Construction of triangles
☐ Engineering: Technical Drawing

The current stage of work is the development of an adequate evaluation plan fitting to the INTACT resource descriptions. The INTACT online platform and the teaching and learning resources will be formatively evaluated with partner schools at all participating countries. Recently the task for the group 2 leaders is to coordinate the schedules for testing and evaluating the INTACT resources dealing with different national curricula and school holidays.

In the last project meeting (Kecskemet between July 10 – 12, 2014) Group 2 has discussed among other issues and focused on Workpackage 9 which is about testing and evaluating the teaching and learning resources. The initial plan for commencement of evaluation was presented by Hungary and Spain the two partners responsible for this phase of the project. It was clear from the onset that the timeline for evaluation would be dependent on 2 main aspects – (1) the curricular plan of the pilot schools in the 2014/2015 school year so that successful paring could be synchronised and (2) the implementation method of the resources. Further discussion would be required to decide on the timeline of implementation of the resources before evaluation methods could be further developed. This would take place in a smaller G2 subgroup.

To make best use of the time in Kecskemet, it was decided that G2 subgroup would work towards developing the implementation and evaluation methods and timelines and completing a microplan for the merging of WPs 5,7 and 9. Discussions took place within G2 subgroup to review all resources in order to select resources that would be evaluated by piloting teachers and implemented in the piloting schools. The selection was based on the level of completion, collaborative content, the overall level of development of the Unit of Work/Lessons and the development of the Learning Objects. A further criterion was the availability of pilot schools for pairing.

The table below outlines the summary of this discussion with 6 resources highlighted as having been selected for initial piloting and evaluation.

Summary Overview of Resource Development				
Lesson Unit	Subject	Level	Level of Development	
			Teaching and Learning and collaborative content	Learning Objects
Where is the Light?	Science	Kindergarten 4-6yrs	+	0
Creatures of the night	Science	Primary 9-10 yrs	+	0
Magnetism	Science	Primary 9-11yrs	+	+
Circulatory System	Science	Primary 11-12yrs	+	0+
Human Immune System	Biology	Post-Primary 13-16yrs	+	+
How much Water do we Waste?	Environmental Education	Kindergarten 4-6yrs	+	?
Translational Motion and the Seasons of the year.	Geography	Post-Primary 12-15yrs	+	+
Legends and Heroes - King Arthur	Second LL	11-12yrs	+	+
Mozart	Second Language Learning	11-13yrs	+	+
Resistors & AC DC Current	Technical Drawing	Post-Primary	+	0

Figure 1. Summary Overview of Resource Development

Further discussions took place within the subgroup to finalise the pairing of nations for collaborative work between pilot teachers during the implementation of these 6 resources which would take place between January and April 2015.

• Lesson Units selected for Development of Learning Objects and Piloting for first round of evaluation • Pairing of teachers/nations for collaborative work			
Lesson Unit	**Subject**	**Level**	**Pairing of Countries**
Magnetism	Science	Primary 9-11 yrs	(IR) (HU)
Circulatory System	Science	Primary 11-12 yrs	(SP) (RO)
Human Immune System	Biology	Post-Primary 13-16 yrs	(DE) (SP)
Translational motion and the Seasons of the year	Geography	Post-Primary 12-15yrs	(PT) (DE)
Legends and Heroes - King Arthur	Second Language Learning	11-12yrs	(HU) (DE)
Mozart	Second Language Learning	11-13yrs	(RO) (HU)

Figure 2.Summary of Pairing of Nations

As for the method of initial evaluation, it was decided at whole group level that the first evaluation of the resources by pilot teachers would take place during the month of September 2014. Discussions at whole group level led to a decision that this first evaluation of the resources by piloting teachers would be based on the Unit of Work and 1 lesson only (the first lesson was selected from each of the 6 resources).

As the Learning Objects for Lesson 1 would not be ready for September 2014, the piloting teachers would use the mock-up/descriptions of the Learning Objects in their current existing format for the first evaluation

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TITLE of UNIT	
KEYWORDS	
LANGUAGE	
SUBJECT COVERAGE	
TARGET AUDIENCE	
AGE RANGE	
BILINGUAL ASPECT	
CONTENT	ADDITIONAL TASKS/ ACTIVITIES TO SUPPORT CONTENT • ADDITIONAL PEDAGOGICAL STRATEGIES (DIDACTICS) TO SUPPORT CONTENT •
ASPECTS FOR COOPERATION AND/OR COLLABORATION	STRENGTHS • WEAKNESSES • ADDITIONAL SUGGESTIONS FOR METHODS OF COLLABORATION • ADDITIONAL REQUIREMENTS TO SUPPORT COLLABORATION •
ASPECTS FOR BILINGUALISM	STRENGTHS • WEAKNESSES • ADDITIONAL SUGGESTIONS FOR METHODS OF BILINGUALISM • ADDITIONAL REQUIREMENTS TO SUPPORT BILINGUALISM
APPROPRIATENESS FOR CURRICULAR REQUIREMENTS OF YOUR NATION	AGE GROUP • CONTENT LEVEL • LANGUAGE LEVEL •
USE OF DIGITAL TECHNOLOGIES to SUPPORT TEACHING AND LEARNING	STRENGTHS • WEAKNESSES • ADDITIONAL SUGGESTIONS

	• ADDITIONAL REQUIREMENTS TO SUPPORT CURRICULAR REQUIREMENTS
ASSESSMENT	ADDITIONAL SUGGESTIONS
DIFFERENTIATION	ADDITIONAL SUGGESTIONS
OTHER	WOULD YOU LIKE TO TEACH THIS UNIT/LESSON? • WHEN COULD YOU TEACH THIS UNIT/LESSON?

Figure 3. Assessment Template for Pilot Teachers

Draft timeline for method of evaluation and implementation developed by subgroup and incorporated into G2 microplan. Changes were to be made to unit / lesson by creator / developer based on suggestions by all pilot teachers. Amended resources were to be uploaded by the creator/developer of resource until 15 November 2014. Creator/developer collected the evaluations from Revision 1 Moodle folder and will revise the resource based on suggestions from pilot teachers. Creator /developer uploaded the revised resource. LOs – after development- had to be uploaded and sent to creators and pilot teachers.

Piloting of the revised lesson (with HTML5 LOs) by collaborating pilot teachers. Between January and April 2015 pilot teachers will pilot the resource using the HTM5 Los. Based on their practical insights amendments to first evaluation of piloted lesson will be added by pilot teachers. By April 30, 2015 pilot teachers will amend their first evaluation following the piloting of the lesson.

Amendment will be sent to SG members in host country where resource is piloted. SG members will upload to Revision 2 Folder on Moodle and email creator/developer to confirm that amendment of initial evaluation is uploaded.

Final changes will be made to lesson by creator / developer based on suggestions by all pilot teachers. The amended resource lesson will be uploaded to Moodle folder titled Final Piloted Lessons by creator/developer of resource until May 15, 2015. Creator/developer will collect the evaluations from Revision 2 Moodle folder and will add final revisions based on suggestions from pilot teachers. Creator /developer will upload the revised resource to Final Piloted Lessons folder.

During the project so far the partners have noticed that the focus of the project goes more and more to the online platform and the aligned functional requirements. An important requirement is that teachers can modify and reuse teaching and learning resources, not being forced to use produced ones that might not suite in the curricula or the classroom situation concerning the student's skills and knowledge. Therefore this will be an important issue for the implementation of the online platform.

The online platform's conceptualization and development for the distribution of resources present some challenges. The requirements for this platform are closely related to the resources and

the underlying concepts. Because both are developed parallel to one another during the course of the project, a close integration of both areas is necessary.

A further challenge is the determination of which subjects to include in the materials.

Two aspects play a role here. On the one hand, the various partners and partner schools have equally varying interests. On the other hand, there are diverse educational plans within the participating EU countries, and therefore the same class level in different countries requires varying teaching and learning resources. On a related note, another challenge is developing bilingual teaching and learning resources. Along with an appropriate difficulty level of content, the material must also be at an appropriate level regarding the students' language abilities.

5. Conclusion

The outcomes of INTACT support the following skills and competencies in: communication in a foreign language in the bilingual education, digital competence using digital technologies for the teaching and learning resources, learning to learn
by working collaboratively and sharing the learning outcome with other students, social and civic competences as well as cultural awareness and expression by cooperating with other students from other countries when using the teaching and learning resources.

Working collaboratively in a heterogeneous group using a foreign language and sharing the learning outcome with other students beyond cultural boarders advocate social and civic competences as well as cultural awareness and understanding for different cultures.

INTACT addresses the following specific objectives and priorities of EU's Lifelong Learning Programme (Comenius) for enhancing bilingual learning with ICT-based content in schools across Europe:

To promote language learning and linguistic diversity. One important aspect in the project is the bilingual education. Several partners of the consortium are well experienced in bilingual education (e.g. Germany, Hungary) and thereby the bilingual aspects are essential considered in all teaching and learning materials.

To support the development of innovative ICT-based content, services, pedagogies and practice for lifelong learning. The projects implements on the one hand interactive teaching and learning materials in different subjects embedded in bilingual settings. On the other hand the project develops and implements an online platform where the teaching and learning materials can be used across cultural borders.

To develop knowledge and understanding among young people and educational staff of the diversity of European cultures and languages and its value. The interactive teaching and learning resources aim to initiate the collaboration between schools in
the region and also across borders. While teachers and students work together on the interactive teaching and learning resources they get to know other countries and learn about country-specific issues.

To help young people acquire the basic life-skills and competences necessary for their personal development, for future employment and for active European citizenship. Learning with the teaching and learning resources in a collaborative situation will be a normal learning setting for students. Students will get into this way of learning while using the interactive teaching and learning resources. The aspects of bilingual education improve the skills of the students in the foreign language, and working together with other countries in Europe will enhance the cultural understanding of the students.

To enhance the quality and European dimension of teacher training. The interactive teaching and learning resources will be spread in the national institution like the Ministry of Education in each country and institutions like Instituto de Tecnologías Educativas in Spain, National Centre for Technology in Education in Ireland, etc.

According to the Europe 2020' strategy the education and training systems in Europe must upon other terms allocate an adequate mixture of skills and competencies, advocating the progress of transversal competences, teach how to use digital technologies and ensure that the citizens have basic skills and that they are motivated and capable of learning (Council conclusions on the role of education and training in the implementation of the 'Europe 2020' strategy, (2011/C 70/01), p. 2). Within this project teachers and students have the possibility to improve their knowledge in all these areas. From the eight suggestions for key competencies for the lifelong learning of the European Parliament and Council, six key competencies will be touched on in this project.

The following six competences will be discussed in detail: (1) foreign language competency, (2) mathematical competency and basic physics competency, (3) computer competency, (4) learning competency, (5) social competency and civil competency as well as (6) cultural awareness and cultural expression ability.

(1) The foreign language competency will be fostered by bilingual instruction in English and German as well as the different mother tongues.
(2) Mathematical and basic physics competencies will be reached through the development and adaptation of learning materials for the mathematics and science-subject courses.
(3) Computer competency will be facilitated through the application of digital technology for learning materials.
(4) By working in heterogeneous groups and by the exchange of educational findings from pupils outside of the classroom and school organizations,
learning competency will be addressed.
(5) Both social competency and civil competency as well as cultural awareness and cultural expression ability, two other key components, will be applied through the communication and cooperation of pupils from various countries and cultural backgrounds.
(6) The project will particularly benefit from cooperation throughout Europe. The development of materials for the lessons especially within the science subjects can be improved with a multi-perspective, international approach.

Combining the teaching of different subjects with bilingual education and the use of digital technologies allows to enhance the skills in a foreign language as well as to improve the digital competencies.

Aside from the usual value of cooperation with international partners this project benefits immensely from the European cooperation. Developing materials for science education incl. environmental and social science issues always improves if different points of view from different nations are considered. The cooperation of the different institutions with their partner schools will help to establish a European network of schools based on the common interest in modern ways of teaching (using interactive technology, bilingual education, and collaborative learning scenarios). Also by working together of educational researchers and pilot teachers the observation of intercultural differences help to sharpen the own viewpoint.

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