

ROADMAP

EARLY LEARN TO LEARN ENVIRONMENT – EL2EL

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Authors: Ali Rashidi, Denis Riabov, Yevgeniya Averhed

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1. INTRODUCTION

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Early childhood education and care (ECEC) “has been, since the 1992 Council Recommendations on Child Care, a recurring topic on European policy agendas”¹

According to the Key Data on Early Childhood Education and Care in Europe 2014 report, “32 million children are in the age range to use ECEC services in Europe”².

All of these children need to attend preschooling institutions, which, in their turn, have to have appropriate quality of their services. This is the reason why this area is given special attention and priority today. Indeed,

“The Commission has set out the priorities for early childhood education and care – with the aim of improving access to and the quality of services from birth to the start of compulsory schooling. Work on this started in 2012 in cooperation with international organisations and stakeholders”³.

It is obvious that the effectiveness of the teaching and learning process largely determines the quality of ECEC. The quality is maintained by compliance to the existing standards, by implementation of

¹ "CoRe: Competence Requirements in Early Childhood Education and Care. Final Report." European Commission, n.d. Web. 18 Dec. 2014. <http://ec.europa.eu/education/library/study/2011/core_en.pdf>.

² European Commission/EACEA/Eurydice/Eurostat, 2014. Key Data on Early Childhood Education and Care in Europe. 2014 Edition. Eurydice and Eurostat Report. Luxembourg: Publications Office of the European Union.

³ "Early Childhood Education and Care." - European Commission. N.p., n.d. Web. 18 Dec. 2014. <http://ec.europa.eu/education/policy/school/early-childhood_en.htm>.

innovations, and by continuous evaluation. The currently proposed project aims at improving preschool education through development of learning-to-learn educational practices.

According to European Reference Framework (ERF), there are eight key competences every European citizen must obtain and possess in order to be successfully integrated into society and the labor market. Acquiring of these competences starts already in the very early age.

In the present Erasmus+ “Early Learn to Learn Environment (EL2LE)”-project, the project initiators decided to focus specifically on one of these competences, - learning to learn:

“Learning to learn is related to learning, the ability to pursue and organise one's own learning, either individually or in groups, in accordance with one's own needs, and awareness of methods and opportunities”.⁴

It is to be noted that “learning to learn” competence is rather new issue in preschool education. There are quite few projects dedicated to its development in European preschool education, which makes the presented project topical in the current European context.

The current Roadmap is developed as one of two outputs of the ‘EL2LE’-project. The goal of the Roadmap is to provide the European Commission and policy-makers at different levels with recommendations on policy and funding in development of the “learn to learn” competence in the field of ECEC.

Another goal of the Roadmap is to disseminate the ‘EL2LE’-project results, which can be useful to preschools, educational researchers, and local policy makers for reinforcing the relevance of ECEC services within local communities.

The expected impact is that the policy paper will be taken into consideration by these target groups and will bring certain value at the European level.

The Roadmap consists of 4 chapters. The first chapter describes the state of L2L-competence in European preschool education, while the second chapter gives an overview of the ‘EL2LE’-project: from its idea to the obtained results.

⁴ "Key Competences for Lifelong Learning." *EUROPA*. European Commission, n.d. Web. 18 Dec. 2014. <http://europa.eu/legislation_summaries/education_training_youth/lifelong_learning/c11090_en.htm>.



The third chapter defines the recommended pedagogical approach and contains the guidelines on implementation of “Learn to learn” competence in preschool curricula. In particular, it describes Learning-to-learn concept and Problem-Based Learning as a method within Learning-to-learn. In its turn, mindmapping is presented as one of the tools of Problem-Based Learning.

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The final chapter presents the findings from ‘EL2LE’-project regarding the immediate recommendations for policy and support funding in the field of “Learn to learn” in preschool education in the 21st century.

2. THE STATE OF L2L IN EUROPEAN PRESCHOOL EDUCATION

According to the European Commission, “all European countries list learning objectives referring to personal, emotional and social development as well as language and communication skills for older children. Some countries also apply these latter objectives to younger children”⁵.

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Based on this statement, it can be deduced that there are no common European objectives, furthermore, there is no strict age frames for target groups of such objectives.

From the one side lack of a common reference point seems to be a major obstacle that European early childhood education system faces today; from the other side it is an opportunity to develop such reference point, taking in account the latest European experience, innovations and knowledge from the complementary fields. The authors of the current project believe that EL2LE-project can contribute in elaboration of the basis for this new European early childhood education system.

The first step on this long way is research of the field. The EL2LE-project partnership includes seven countries from different regions and consists of both public and private schools, each partner possessing different experiences. This fact created a beneficial panel for a qualitative research, the results of which are presented below.

L2L at the preschool level

L2L competence more or less exists on preschool level in all countries. It is impossible to tell the exact extent to which it is used, due to the fact that it is difficult to measure such complex phenomenon. Nevertheless, it is clear that the competence is present at all preschools, that the schools are aware of its importance and are aiming at improving the situation within the frames of the competence.

Existing situation in preschool field

⁵European Commission/EACEA/Eurydice/Eurostat, 2014. Key Data on Early Childhood Education and Care in Europe. 2014 Edition. Eurydice and Eurostat Report. Luxembourg: Publications Office of the European Union.

Although all preschools work with “learning to learn”, the educational methods and techniques that are used to deliver the competence to children are different.

In fact, almost none of the partners use the same educational methods and techniques. From the first glance it may seem that the preschool field in Europe is eclectic and has little in common in different countries, but it is not true.

The fact of the matter is that the partners did not name their L2L activities with the same words. This means that although there are no common official European educational methods that are widely used in European preschool space, there are similar methods that actually do intersect. For instance, what they call ‘Involvement’ in EXE approach in Belgium is closely related to personal engagement in Croatia; if in Latvia they concentrate on games, in Turkey they pay attention specifically to toys.

Based on such similarities in project partners reports, it is possible to outline several groups of common educational methods and techniques, which can probably be called typical for the whole Europe. They are:

1. **Development of critical thinking** (Belgium, Greece)
2. **Personal involvement.** Learning through engagement, personal experience; learning through actions (Belgium, Croatia)
3. **Projects.** Project activities and project planning. (Croatia, Greece)
4. **Individual and cooperative learning.** Individual approach, individual activities, communication with the child on an individual basis, working with a whole group or with small groups. (Croatia, Latvia)
5. **Organisation of environment.** Physical environment, educational environment. (Latvia, Turkey)
6. **Playing.** Games and toys. (Latvia, Turkey)
7. **Preschool materials.** Contact with specific materials, including natural materials. (Croatia, Turkey)

These educational methods altogether are the features that constitute the competence of L2L itself. They are proved to be working, and can always be successfully used in preschool education throughout Europe.

Concerning the other methods, listed only by one of the partners (such as, for example, outdoor pedagogy, using ICT in preschool programmes, processual orientation), it is to be said that they can be gathered into a group of innovational methods. This means that before transferring / adopting these methods to another institution, they have to be adapted to cultural realities and are not guaranteed to improve the preschool intuition functioning.

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It is necessary to mention the directions for improvement, listed by the partner countries. Among them are:

- Following common European goals and objectives
- Networking and experience exchange with other experts
- Expanding knowledge on evaluating the progress of children
- Improving teachers' English languages skills
- Developing learning styles and related teaching techniques
- Learning to use different ICT tools
- Wider usage of natural materials, including special laboratories for it
- Orientation rather to the process of learning than to the result

It can be concluded that the existing “Learn to Learn” situation in European preschool system is very diverse. The educational L2L methods vary from country to country, not to mention that may even be different on national level within different preschools. Nevertheless, there are similarities. The challenge is to make them official and bring to the European level, which this project is attempting to do.

3. THE EL2LE PROJECT: FROM THE IDEA TO THE RESULTS

3.1 Goals and objectives

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Early childhood years are important because it is the period when children should receive education to improve their cognitive, social, emotional, and physical skills. Precisely, it is the time when children form habits to shape their lives in future and that is why a well-planned and implemented education and care is necessary.

Recently, EU has prioritized both the quality and quantity of preschool education to increase the number of employed people, especially mothers and to provide the best possible start for the future by keeping the quality and quantity of ECEC services high as stated in Communication from the Commission in 2011. Considering this, the 'EL2LE'-partnership developed a project to increase the quality of preschool education. Within the project activities the participant children acquired many competences related to art, creativity, problem solving and critical thinking based on learn-to-learn competence. Furthermore, they had an opportunity to release their talents to the fullest extent possible during their early childhood years. During the project the partners encouraged children to make toys with natural materials and therefore use their imagination and express their feelings through art. In doing so, they were given a chance to think critically and creatively while making the toy, as the process of making it was more meaningful.

Cooperation between schools and parents supported this process. The partnerships carried out a survey to find out how much parents know about learning to learn, as well as critical and creative thinking. Additionally, a needs analysis survey has been conducted in order to find out teachers' competencies and needs for implementing the project to its full potential. Based on the results of these surveys the partnerships formulated 3 sets of goals, towards which the project strive. They were:

GENERAL OBJECTIVES

- to ensure cross-sectoral collaboration to maintain the quality of the project implementation and results
- to increase the quality of ECEC



- to take up new educational practices by paying attention to learning styles and critical thinking
- to promote the effective use of ICT besides creating and using Open Educational Resources (OER)
- to promote a student-centered approach that views children as competent, active agents
- to stimulate the idea of a healthy life style for preschool children by using natural products in making toys
- to value and encourage pupils' expression of themselves through craft work
- to build up the idea of internationalization among ECEC staff
- to offer training to teachers
- to improve creative skills and exchange art and craft activities
- to reinforce European integration
- to facilitate interaction among participant teachers to exchange ideas and experiences

TEACHERS OBJECTIVES

- to adopt the idea of professional development as a continuous learning process
- to use innovative approaches in teaching considering pupils' needs and expectations
- to create and organize effective learning environments and activities in nature
- to adopt better recognition and validation of competences
- to increase computer literacy and language competency in English
- to have a better knowledge of how to use critical thinking strategies, methodologies and learning styles in teaching
- to renew motivation and share experiences
- to evaluate cognitive and social development of pupils

- to learn to develop activities, teaching and testing materials for kids to reflect critically
- to get familiar with cultural activities and customs in partner countries
- to form a stronger society while keeping the number of early school leaving at the lowest

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PUPILS OBJECTIVES

- to identify and deal with problems or difficulties objectively
- to acquire the ability to make quick decisions by analyzing
- to learn to think outside the box
- to become confident, analytically thinking individuals
- to become more successful people with self-discipline and ability to work in a team
- to get creative and develop new skills for new jobs
- to learn to search, collect, classify, compare and analyse materials, which will lead them to form a habit of learning to learn
- to manage their own learning and to develop competence in learn-to-learn
- to build a good sense of nature and art

The partners have also identified the following needs within ECEC sphere:

- to think beyond the curriculum to promote autonomous learning, creativity and critical thinking
- to plan activities where creativity and critical thinking can boost
- to organise effective learning environments
- to promote the professionalization of ECEC staff through trainings
- to improve the quality of ECEC to prepare kids for future education and form a strong society



- to increase the number of employed people, especially mothers in labour market
- to reduce the number of early school leavers
- to promote the idea of nature and natural toys
- to take up new approaches in teaching and exchange practices with partner countries
- to develop Open Educational Resources about ECEC services
- to support international cooperation through mobility exchanges and transnational projects
- to write a pedagogical guidance for teaching staff
- to strengthen collaboration between ECEC and training institutions

In the 'EL2LE'-project, the partnership aimed to achieve results that would be effective and useful for preschool education, as well as to contribute in increasing quality of the ECEC services. Due to developing "L2L" competence being one of the new educational targets, the partnership conducted a research in the field first, proceeding with organisation of trainings for teachers. When the teachers were trained, they started to work with children within the developed activities that promoted critical reflection (also in natural places). After the implementation of the activities, the partnership created a Moodle platform in order to use this IT-tool further as an Open Educational Resource (OER). The partnership uploaded to the platform the developed within the project activity plans, information modules, as well as recommendations to teachers and policy makers. As it was mentioned before, the current "L2L Road Map" is another output of the project.

The project involved various preschool stakeholders, such as teachers, parents, students, policy makers and others. The partnership expects each of the group to benefit from the project results, while the developed OER to contribute to development of preschool education across Europe.

3.2 The EL2LE project: Sustainability of the results

The sustainability of the project is ensured through:

1. Sustainability of the project Intellectual Outputs
2. Internal exploitation of the project results by the project partners
3. Continuous dissemination of the project results to external audiences

Sustainability of the project Intellectual Outputs

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The project contains 2 Intellectual Outputs: Moodle platform as an Open Educational Resource, and L2L Roadmap.

Moodle platform with all of the training materials developed within the project is of a free access for everyone interested across Europe in order to provide an opportunity for as many people as possible to subscribe to the platform and begin to use the elaborated resources.

The Moodle platform will remain open after the project. Interesting activity scenarios and training materials will be continuously shared and uploaded there. And kindergarten teacher in Europe is now able to access the platform and use the detailed activity plans or read modules to get information about “learn to learn”. After the end of the project, all of the activity plans, modules, deliverables, and guidelines will still be accessible in the platform. While conducting the suggested activities in their classes with their children, any European teacher can share their experience by commenting or uploading the results and remarks about the activities to the platform. Furthermore, the platform has already made a long-lasting impact on the professional development of the staff from partner’s organisations, which guarantees sustainability of this Output among them.

L2L Roadmap guidelines have been distributed by the partnership to the policy makers, kindergartens and their staff, as well as to the other relevant stakeholders. Along with the Roadmap, specially developed "EL2LE" guides for teachers and parents are also open for free access in the Moodle platform.

Internal exploitation of the project results by the project partners

The partnership aims at the project’s effects to continue after the project finishes.

The partners will continue to implement the activities. The partners will continue to announce the activities via their websites and newsletters. The in-house training courses on “learn to learn” will be conducted within the partner organisations at least two times in two years after the project.

During the project, the partners prepared a natural materials corner in each school's classrooms and special garden. The partners are planning to maintain them and go on using project activities done with natural materials in their daily routine by this way. Thus the partners aim to make the project results permanent for children, so that children are familiar with natural materials not only during the project. Besides this, the partnership is planning to use the elaborated outdoor activities after the project by including them in their monthly outings.

The partnership also considers families as one of the target groups of the project. After the project, the partners will send the "EL2LE" Guide for Parents to parents in their schools, as well as in schools in the neighborhood. In particular, in a year following the end of the project, each partner school will find at least 3 schools from their local area and distribute "EL2LE guides" to parents. The same will be carried out for "EL2LE Guide for teachers".

After the project the partnership is planning to start a new project that will have an expanded target student group. The new project will include primary school students besides preschool students. This will provide the continuity and consistency of this "learn to learn" education in children's future educational experience. With more developed and challenging activities on the same topic, this project can be easily continued with other projects under the partnership of both the same and different schools.

When it is done with different partners from different countries and also from different sectors, the projects' results can be extended and many different views contribute to do the best for children and increasing the quality of education. These kinds of partnerships will also contribute to increase cultural interaction among different countries.

Continuous dissemination of the project results to external audiences

After the project ends, the project team will keep on doing their best to reach more people through different channels to make them aware of the "L2L" method, its implementation in the classroom and benefits to the preschool children' development and thinking skills.

During the project, the partners have created national and international networks; after the project is completed, the number of members of these project-related networks will grow. Through these networks, the partnership has a chance to establish the project at an international level and ensure that the project's outputs reach their target groups.

The partnership will run an email campaign for the teachers from other schools by using the mail lists from the conducted seminars and trainings on “learn to learn” practices. Thus we will share outcomes of the project, ongoing works and get information about their practices related to the nature and natural materials. Besides online information sharing, the partners are planning to come together with these other willing teachers to observe each other’s practices. Teachers can visit the partner schools and observe the “learn to learn” processes in real implementations.

The partners have shared the project results on their corporate websites, as well as in external online groups for teachers and kindergartens. After the project, a specially-designed newsletter will be sent to about 2000 schools in Europe in order to raise awareness about the project results.

3.3 European added value

Since the project partners are a part of a large EU community, it is important to follow common goals and objectives. This is particularly true when it comes to children’s competences, especially the L2L competence. It is necessary for a child to understand the value of learning in its very broadest sense from a very early age.

The partnership believes that the project offers a global field of experience and knowledge, as well as ensures key preschool staff development through a dialogue, sharing, reflection, and multi-cultural understanding. Teaching staff at partner institutions have increased their professional level and adapted the ideas of continuous learning and L2L-methodology to their work. This has contributed to the project goal of making an innovation in education on the European landscape.

The innovative Intellectual Outputs of the project have the capacity to increase the quality of ECEC services, as well as to contribute to formation of a better society in general.

The developed OER Moodle platform with training materials has the potential to effectively contribute to improvement of preschool education across Europe. Furthermore, it is supplied by special L2L guides for teachers and parents.

In European level, the desired ultimate impact is mainly to reach as many students as possible in Europe.



Up to now the project has already had a significant impact on the partner institutions, as well as on the vast stakeholder network, created during the project's lifetime. These small local eco-systems in the partner countries have the perspectives to grow and eventually represent a majority, able to streamline their L2L in preschool education efforts across Europe.

4. GUIDANCE ON IMPLEMENTATION OF “LEARN TO LEARN” COMPETENCE IN PRESCHOOL CURRICULA

4.1 Methodological approach

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Reluctantly, practical application of teaching the Learning to Learn competence appears to be quite chaotic today. Very few institutions deliberately aim to developing specifically this competence in children, even less of them exert targeted efforts to do it in a structured way. Many institutions use certain L2L tools; nevertheless, in many cases such tools work only towards one of the aspects of the L2L competence.

The ‘EL2LE’-partnership has developed a methodological approach that can structure and facilitate acquisition of the L2L competence by children.

In particular, the project partners suggest to regard L2L rather as a concept, sophisticated enough to not be broken down into specific tools directly. There is a need in a substantial methodology that would be an umbrella for a set tools; these tools would serve for the same goal and complement each other to cover each aspect of the L2L competence.

The partners believe that Problem Based Learning (PBL) can be such methodology. This educational method both reflects most of the aspects of Learning to Learn and contains a range of universally recognized tools that develop L2L competence.

Below we present an overview of Learning to learn (L2L) as a concept, describe Problem-Based Learning as a method, and present mindmapping as a major tool that can be used by preschool intuitions within the framework of L2L and PBL.

4.1.1 Learning to learn (L2L) as a concept

Introduction

European Reference Framework (ERF), introduced in 2007, comprises 8 key competences for lifelong learning. Key competences are necessary to be acquired by all individuals for their personal fulfilment and development, active citizenship, social inclusion, and employment.

The Reference Framework sets out eight 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.

Although the key competences are all considered to be equally important, their acquisition has different importance at different stages of individual's development. The EL2LE partnership considers 'Learning to learn' competence to be among the most crucial ones for kindergarten children.

Many of the competences overlap and interlock: aspects essential to one domain will support competence in another. "Learning to learn" can be the fundament for successful development of the other 7 competences; it is the glue, present in all of the other 7 competences. That is why the EL2LE partnership decided to adapt the theoretical framework of this competence as a pedagogical approach in the EL2LE project.

What is “Learning to learn”?

“Learning to learn” has the following definition:

Learning to learn is the ability to pursue and persist in learning, to organise one’s own learning, including through effective management of time and information, both individually and in groups.

This competence includes awareness of one’s learning process and needs, identifying available opportunities, and the ability to overcome obstacles in order to learn successfully. This competence means gaining, processing and assimilating new knowledge and skills, as well as seeking and making use of guidance.

Learning to learn engages learners to build on prior learning and life experiences in order to use and apply knowledge and skills in a variety of contexts: at home, at work, in education and training.

Knowledge, skills, and attitudes

Key competences represent a transferable, multifunctional package of knowledge, skills and attitudes.

According to the European Commission, where learning is directed towards particular work or career goals, an individual should have **knowledge** of the competences, knowledge, skills and qualifications required. In all cases, learning to learn requires an individual to know and understand his/her preferred learning strategies, the strengths and weaknesses of his/her skills and qualifications, and to be able to search for the education and training opportunities and guidance and/or support available.

Learning to learn skills require firstly the acquisition of the fundamental basic **skills**, such as literacy, numeracy and ICT skills that are necessary for further learning. Building on these skills, an individual should be able to access, gain, process and assimilate new knowledge and skills. This requires effective management of one’s learning, career and work patterns, and, in particular, the ability to persevere with learning, to concentrate for extended periods and to reflect critically on

the purposes and aims of learning. Individuals should be able to dedicate time to learning autonomously and with self-discipline, but also to work collaboratively as part of the learning process, draw the benefits from a heterogeneous group, and to share what they have learnt. Individuals should be able to organise their own learning, evaluate their own work, and to seek advice, information and support when appropriate.

A positive **attitude** includes the motivation and confidence to pursue and succeed at learning throughout one's life. A problem-solving attitude supports both the learning process itself and an individual's ability to handle obstacles and change. The desire to apply prior learning and life experiences and the curiosity to look for opportunities to learn and apply learning in a variety of life contexts are essential elements of a positive attitude.

In the table below it is indicated how the European Commission defined the Learning to learn competence.

Knowledge	Skills	Attitude
<i>Knowledge and understanding of one's preferred learning methods, the strengths and weaknesses of one's skills and qualifications.</i>	<i>Effective self-management of learning and careers in general: ability to dedicate time to learning, autonomy, discipline, perseverance and information management in the learning process.</i>	<i>A self-concept that supports a willingness to change and further develop competences as well as self-motivation and confidence in one's capability to succeed.</i>
<i>Knowledge of available education and training opportunities and how different decisions during the course of education and training led to different careers.</i>	<i>Ability to concentrate for extended as well as short period of time.</i>	<i>Positive appreciation of learning as a life-enriching activity and a sense of initiative to learn.</i>
	<i>Ability to reflect critically on the object and purpose of</i>	<i>Adaptability and flexibility.</i>

learning.

Ability to communicate as part of the learning process by using appropriate means (intonation, gesture, mimicry, etc.) to support oral communication as well as by understanding and producing various multimedia messages (written or spoken language, sound music etc.)

Thus, the above broad EU-definition makes a distinction between three different angles of Learning to learn: Learning to learn as capacity to learn or study, Learning to learn in the professional context, meaning acting as a professional, and Learning to learn in the context of managing one's own career.

Learning to learn and Problem-Based Learning (PBL)

The described knowledge, skills, and attitude are the ultimate stage of the development of the 'Learning to learn' competence. It is the absolute possession and expression of the competence. To be able to develop this competence to this level later in life and expand it to such areas as acting as professional and managing one's career, much effort needs to be made.

The learning process starts directly with development of the capacity to learn or study itself. This is the 'beginners' level, the starting point to develop the 'Learning to learn' competence. The EL2LE partnership believes that the most effective method to do it in the kindergarten is Problem-Based Learning (PBL).

4.1.2 Problem-Based Learning (PBL) as a method

Problem-based learning (PBL) is a student-centered pedagogy in which students learn about a subject through the experience of solving an open-ended problem.

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A number of trends have contributed to the adoption of project-based learning as a 21st-century strategy for education. Cognitive scientists have advanced our understanding of how we learn, how we develop expertise, and how we begin to think at a higher level. Fields ranging from neuroscience to social psychology have contributed to our understanding of what conditions create the best environment for learning. Culture, context, and the social nature of learning all have a role in shaping the learner's experience. These insights help to explain the appeal of PBL for engaging diverse learners.

Education today is changing from one of factual based to one of inquiry based. This new approach to learning is bringing about new ways in which students are involved in the learning process. Teachers know that students do not learn at their highest potential when they are in a classroom where the teacher stands at the front of the room and gives them knowledge. Students learn best when they are engaged in the learning process and discover for themselves the meaning of knowledge. Problem-Based Learning (PBL) in the student centred classroom gives students the chance to discover knowledge in a meaningful and applicable way.

Although PBL applies across disciplines, it consistently emphasizes active, student-directed learning. Why is this approach more likely than rote memorization to lead to deeper understanding? Relevance plays a big role. Projects give students a real-world context for learning, creating a strong "need to know." Motivation is another factor. Projects offer students choice and voice, personalizing the learning experience. By design, projects are open-ended. This means students need to consider and evaluate multiple solutions and, perhaps, defend their choices. All these activities engage higher-order thinking skills.

Problem-based learning allows teachers to create tasks whose complexity and openness mimic problems in the real world. Students can see the interdisciplinary nature of these tasks, and see that each task may have more than one solution. Students who have the freedom to choose different strategies and approaches may become more engaged in the learning process, and these students will be more likely to approach other problems with an open mind.

In addition, students who are involved in creating the project assignment or the project checklist gain valuable experience in setting their own goals and standards of excellence. This gives students a sense of ownership and control over their own learning. Learners have the added opportunity to

identify related sub-topics and explore them in a project based scenario. Teaching with the project based method enables students to work cooperatively with peers and mentors in a student-centred environment where learners are encouraged to explore various topics of interest.

There are several reasons for using PBL and many of them have resulted from the findings of research.

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1. Students retain little of what they learn when taught in a traditional format.
2. Students often do not appropriately use the knowledge they have learned.
3. Since students forget much of what is learned or use their knowledge appropriately, instructors should create conditions that optimize retrieval and appropriate use of the knowledge in the future.
4. PBL creates the three conditions that information theory links to subsequent retrieval and appropriate use of new information:
 - Activation of prior knowledge - students apply knowledge to understand new information.
 - Similarity of contexts in which information is learned and later applied - research shows that knowledge is much more likely to be remembered or recalled in context in which it was originally learned. PBL provides problems within context that closely resemble future professional problems.
 - Opportunity to elaborate on information that is learned during the problem-solving process - elaborations provide redundancy in memory structure, reduces forgetting, and facilitates retrieval. Elaboration occurs in discussion with peers, peer-teaching, exchanging views about what students have learned during the problem-solving process.

Thus, problem-based learning is a style of active learning. Working in groups, children identify what they already know, what they need to know, and how and where to access new information that may lead to the resolution of the problem. The role of the teacher (or a parent) is to facilitate learning by supporting, guiding, and monitoring the learning process. The teachers and parents must build children's confidence to take on the problem, and encourage them, while also stretching their understanding.

A PBL exercise could be:

- ✓ An exploration of a social question
- ✓ An investigation of an event or a natural phenomenon

- ✓ A problem-solving situation, either real or in a fictitious scenario
- ✓ An in-depth examination of a controversial issue
- ✓ A challenge to design a physical artifact, develop a plan, or organise an event
- ✓ A challenge to create/handcraft something for a particular audience or purpose

4.1.3 Mindmapping as a L2L and PBL tool

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A mind map is a diagram used to visually organize information. A mind map is often created around a single concept, drawn as an image in the center of a blank page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those.

Mind maps can be drawn by hand as pictures, written as "notes", or made, for example, or as higher quality pictures when more time is available.

Concept Maps in Early Childhood Education

Although there is a large developing body of literature on concept mapping as an instructional and learning tool in elementary, secondary, and higher education, little has yet been written about the use of concept maps (or graphic organizers in general) in early childhood education (McAleese, 1998, 1999; Novak, 1998; Santhanam, Leach, & Dawson, 1998; Zanting, Verloop, & Vermunt, 2003). Perhaps the assumption is that preschool children do not yet have the ability to use various types of representations (e.g., networks of propositions or words, sequence of events in time and space). However, current knowledge about early learning emphasizes children's capacity to represent knowledge that is presented in ways that are developmentally appropriate (Smith, Cowie, & Blades, 2001). The few studies that have investigated the use of concept maps in preschool education seem to suggest the same thing: if introduced and used in developmentally appropriate ways, concept mapping is particularly effective in helping children see and externalize the relationships among concepts (Alí Arroyo, 2004; Badilla, 2004; Figueiredo, Lopes, Firmino, & de Sousa, 2004; Mancinelli, Gentili, Priori, & Valitutti, 2004). For example, Mancinelli et al. (2004) used object manipulation, clinical interviews, conversation, and drawings to help 4- to 5-year-old children to build their own concept map about the process of making papier-mâché. Figueiredo et al. (2004) helped children from 3 to 5 years old to represent the "things we know about the cow" using discussion and real objects (which they gradually replaced with pictures) and providing them with map templates in order to help them put concepts in a hierarchical structure (e.g., the cow gives us milk from which we make yogurt, cheese, butter, etc.). Two more examples of using concept maps with young children come from Nancy Gallenstein (2005, p. 46), who helped kindergarten children "share their knowledge about good nutrition" using both objects and pictures; and Badilla (2004), who used pictures to help 5- to 6-year-old children generate a concept map about "the house" and understand certain characteristics of concept maps such as their hierarchical structure and the possibility of linking different concepts in different ways.

Concept maps in early childhood education can be used by teachers and children alike. As a teaching tool, concept maps can be used to help children clarify, organize, relate, and group ideas and

information about a topic. In doing so, children learn another way of representing and communicating what they know. In addition, concept maps help children to literally see relationships among concepts and remember information more easily. Moreover, concept maps, like webs, allow children to revisit them and expand them. As children go back again and again, the teacher can see how new knowledge is integrated with old knowledge and diagnose misunderstandings. The latter is very important since, as Ausubel, Novak, and Hanesian (1978) argue, preconceptions (and misconceptions) are crucial for the quality of subsequent learning. Missed relationships and concepts, in particular, as well as wrong connections, can tell teachers a lot about children's conceptions and comprehension of the topic under discussion. To rectify misconceptions, the teacher can provide children with opportunities to apply the concepts under study in different contexts or ask questions that force children to review their conceptions critically.

Concept maps can also be used to organize teaching or the entire curriculum. As a planning tool, they can help teachers plan, structure, and sequence the content of their teaching. As they create a map of what they want to teach, teachers can see how different themes and topics are linked, so continuity of experience is ensured, and develop units and activities that integrate different subjects.

Clearly, if concept maps are to fulfill their potential as a teaching tool, preschool children's needs and cognitive abilities need to be taken into consideration. More specifically, early childhood educators interested in using concept maps should keep in mind the following:

- Obviously, young children are not going to be in a position immediately to construct a concept map on their own. In fact, as Sparks Linfield and Warwick (2003) point out, young children need to be taught the technique of concept mapping, and therefore a period of direct instruction is necessary before children can successfully construct their own concept maps (Ferry, 1997). This process should start by having children observe their teacher creating concept maps.
- When modeling the process of concept map creation, teachers should give particular emphasis to the linking or "joining" words and help children understand that "they are what makes the whole thing have meaning" (Sparks Linfield & Warwick, 2003, p. 126). Those words help create the propositions, the main characteristic of concept maps.
- Concept maps should be introduced after children have had many opportunities to manipulate real objects, observe what is going on around them, record their observations, and communicate their findings and impressions in different ways. Having those experiences is important because it is through these experiences that concepts and generalizations are formed (Mancinelli, Gentili, Priori, & Valitutti, 2004). Concrete experiences are also crucial for the development of representational thinking. For example, children must have observed plants needing to be watered and seen for themselves what happens to be able to represent graphically the relationship "plants need water." It is also better to introduce concept maps after children have had some experience with simple, less-structured graphic organizers such as webs as a way of summarizing and presenting information.
- Children's first attempt to create a concept map should be done within the context of a simple, familiar topic (e.g., animals or plants) and using a small number of concepts (e.g., 2

to 4). In addition, as Sparks Linfield and Warwick (2003) suggest, with young children it “would be more sensible to simplify concept mapping, making it a method of showing links between concepts but ignoring the hierarchical structure of those concepts” (p. 125). Figures 3 and 4 show two examples of the kind of concept map that Sparks Linfield and Warwick are referring to. Their argument is supported by the findings of a study conducted by Figueiredo et al. (2004), which suggests that kindergarten children find it difficult to depict even simple hierarchical relationships without a visual aid, namely a map template (with boxes and lines).

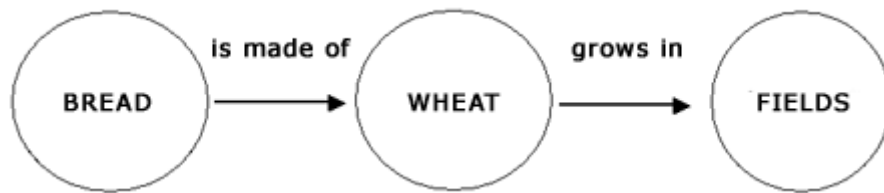


Figure 3. An example of a concept map using a simple, familiar topic.

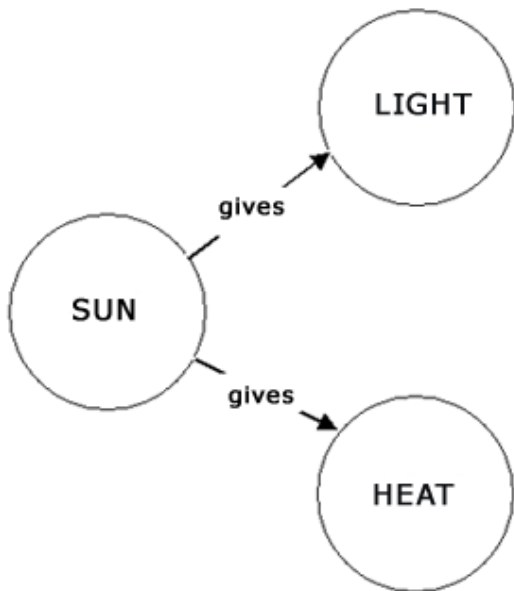


Figure 4. Another example of a simple concept map.

- To better familiarize children with concept maps, pictures (or photos or drawing images) can replace text labels (words) because children of this age communicate their ideas better through symbols (Pearson &Somekh, 2003). Drawings or pictures can also be used by and for children who speak a different language or have reading or writing problems (Pearson &Somekh, 2003). One difficulty with using children’s drawings is that if they are not clear (because of children’s limited drawing skills), it will be difficult for children to remember their representations if they need to revisit their maps (Gomez, 2005). Teachers who work with 4- and 5-year-olds should also consider that, as research on children’s graphic development suggests, at this stage the objects depicted in children’s drawing “typically appear to ‘float’ on the page” and are “seldom drawn in relationship to another in position

or size” (“Young in Art,” n.d.). To differentiate the hierarchical levels or to show the reading order of the map, teachers can help children assign numbers to their symbols (Mancinelli, Gentili, Priori, & Valitutti, 2004). Concept maps based on children’s drawings look more like “real” concept maps around the age of 5 or 6, when most children have acquired not only a larger “repertoire” of graphic equivalents for the things that they see around them but also a better sense of how things can be organized in space (“Young in Art,” n.d.). Depending on children’s ages and previous experience with concept maps, teachers can also use real objects to represent concepts and relationships. As children become better readers and writers, simple words can replace objects, drawings, or pictures. In any case, the important thing is to help children see and understand that concepts (objects or pictures) are linked to form meaningful statements and that relationships between concepts can be represented graphically.

Figure 5 summarizes the steps that teachers can take to model the creation of a concept map (adapted from Novak & Gowin, 1984; White & Gunstone, 1992).

1. Select the key concepts of the topic under study (e.g., sun and earth, sun and heat) after discussing with children “what we have seen or learned.”
2. On a large piece of paper or the board, write or draw (or use pictures or photos) the key concepts (leave enough space between them so that the connecting lines are long enough to be seen and can have words written on them). Next, put words or pictures in large circles or boxes (concepts could also be written on 3-x-5 cards).
3. Connect the concepts (circles) with a line (or an arrow depending on the relationship you want to represent). As you link the two concepts, state in a simple and short sentence the relationship between them (e.g., “So, we’ve learned that the sun warms the earth” or “The sun gives heat”). This allows children to “see” and “follow” your thinking. Label the line using simple action words (e.g., warms, gives, needs, becomes) that specify the relationship between the concepts. Write the connecting word (e.g., warms) on the line. Use different colors for circles and links to help children see these as different types of information.
4. Encourage children to “read” the map on their own (or else recite the sentence).
5. Have children copy the map from the board.

Figure 5. Steps in modeling the creation of a concept map.

After modeling the process of creating concept maps several times and before teachers move into encouraging children to construct their own concept maps “from scratch,” there could be another stage where children practice interacting with (rather than constructing) different types of “incomplete” maps (Noyd, 1998). Those include “concept-only” maps, where key concept words are identified and pre-structured on the map and children are asked to fill in the missing propositions and direction arrows in the spaces provided; and “link-only” maps, where key relationships/propositions are already pre-structured and labeled on maps and children are asked to fill in the missing concept words in the spaces provided (Yung, 1997).



When children are ready to build their first concept map, it is perhaps better if this happens in the context of a project rather than during a “one-off” teacher-structured activity. This strategy would help children to see concept maps as a way of organizing information received from different sources and summarizing what they are learning (Novak & Gowin, 1984). It is also advisable to start with a linear rather than a hierarchical concept map. The following steps outline the procedure when teaching children how to construct a concept map:

1. During group discussion, the teacher asks children to talk about the things they have learned through the exploration of the topic under study (e.g., “through our field trip, we learned that bread is made of wheat” or “we show that all families have rules”). As children talk, the teacher writes down in ready-made paper circles the key concepts arising from children’s observations and ideas (e.g., “bread” and “wheat,” “families” and “rules”). Circles should be large enough for children to draw on the side of each word a picture that symbolizes the specific concept. In this way, concepts can be “read” by everybody no matter their communicative and linguistic capacities.
2. Next, circles are put on the floor, and children are asked to arrange them in a simple sentence that expresses the relationship between them. Once children have identified the relationship between the concepts and created their sentences, circles can be glued on a large piece of paper so links can be drawn.
3. Finally, children are prompted to show the relationship between the concepts by connecting them with lines (or arrows if needed). Then, the teacher (or children themselves) can write the action word (verb) that completes the proposition.

As children engage in the process of creating a concept map, early childhood teachers should keep in mind that concept mapping is a creative activity in which “the learner must exert effort to clarify meanings by identifying important concepts, relationships, and structure within a specified domain of knowledge” (Cañas, 2003, citing Novak & Gowin, 1984, p. 22). Within this framework, teachers should enhance and support children’s thinking through questions that prompt for justification, request clarification, encourage connections among concepts and ideas, and provoke more questions on the part of the children (Cañas, 2003).

Finally, it is also important for children to see that concept maps are not “an end in themselves.” Rather, they are a tool for developing relationships and making them more explicit. To show them that concept maps are not static statements or just pictures, teachers should encourage children to go back and rework them (add or change concepts or links) as their understanding of the concepts they are working on develops or as they gain new knowledge or insights (Maxwell, 1996; Novak, 1998). As children do so, teachers can check their conceptual understanding. In practice, this means that concept maps should stay in view, and within easy reach of the children, from the day they are constructed until the day the teacher judges that they are not needed any more.

Thus, concept maps are a useful instructional tool even in preschool education. Concept maps can be used to help children see concepts and the relationships between them and externalize their ideas. They also help teachers to assess children’s conceptual development and understanding, identify

misconceptions, and facilitate learning by building new knowledge on old knowledge. In preschool education, direct instruction and modeling of concept map creation are needed in order for children to see their purpose and eventually create their own concept maps. Once familiar with the idea and the process, children can construct their own maps either individually or collaboratively.

4.2 Guidelines for implementation of L2L and PBL in preschool educations

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Although the project experience and the suggested methodology have been described in details within the document, individuals new to the field of L2L may have difficulties in applying the presented knowledge, in implementing the proposed methods and tools in practice.

In order to facilitate this process the ‘EL2LE’-partnership summarised the essence of the ‘EL2LE’-project into the practical guidelines, which are ready to be used by preschool institutions in their work regardless their level of awareness about L2L.

These guidelines can be presented as 7 concrete steps, namely:

1. Learn about the methodological approach

To be able to apply L2L and PBL, one must know what it is. For this purpose it’s recommended to thoroughly study the current chapter of the Roadmap, along with the relevant sources from the list of sources for the Roadmap. In particular, one could read about Learning to learn (L2L) as a concept, Problem-Based Learning (PBL) as a method, and review the proposed L2L and PBL tools.

2. Get acquainted with EU situation regarding L2L and the ‘EL2LE’-project

To be able to develop your own action plan within the next steps, it’s vital to understand the context and your place in it. In order to do this, it is useful to read about the state of L2L in European preschool education and about the ‘EL2LE’-project.

3. Understand the situation in your institution

In order for the tools to bring maximum benefits to your institution, it’s necessary to see the direction where you are going. For that it’s crucial to conduct the situation analysis inside your organization, identifying your problems, strong and weak sides, as well as the opportunities

available. After that it's recommended to audit your institution specifically regarding your usage of L2L and PBL in order to set yourself a reference point and retain the experience that you already have regarding the topic.

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4. Review the 'EL2LE' Moodle platform, PBL activity template, and evaluation tools

Before planning actions towards implementing L2L and PBL, it could be useful to review the instruments that are already available. In particular, one can use 'EL2LE' Moodle platform, which contains a number of L2L activities, developed by the 'EL2LE'-partnership (Annex 7.1). For developing new activities one can use the special template, also elaborated by the partners (Annex 7.2). Also in order to prepare for the planning it's recommended to choose evaluation tools that will be used to measure the progress. The main approaches that 'EL2LE'-partners used to evaluate their activities are described in Annex 7.3

5. Planning implementation of L2L and PBL within your institution

Based on 4 previous steps elaborate a strategy or plan on how to implement L2L in work of your organisation. Educate the staff, draw the timetable, choose activities from 'EL2LE' Moodle platform or design your own ones according to the PBL template, plan how the evaluation of your work will be carried out.

6. Implementation

This is immediate realization of the planned actions. One must be prepared that the original plan will be altering due to the newly-gained experience from the first activities conducted. The goal at the beginning of working with L2L and PBL is to test different activities and different tools in order to choose the most relevant ones for your institution.

7. Evaluation



This step can be taken at any point (or at several points after certain periods of time) of working with L2L. At this stage it's important to analyse the data, retrieved from using chosen earlier evaluation tools. Based on the results, it'll be possible to correct the plan, elaborated at step 5, or even create a new - long-term - one.

5. Recommendations for policy and support funding in the fields of 21st century “Learn to learn” in preschool education

On the moment of this project proposal the issue of improvement of quality of ECES services was given priority by the EU Commission. To respond to this call and face the problem, the current project has been carried out.

“Learn to learn” activities have, in line with the Commission’s recommendations, been designed as a cross-subject dimension, not as a new subject in the curricula, or as a marginalized “exotic theme”, separated from normal school activity. The suggested methodological approach and training materials ensure the quality and usability of the project’s outcomes by other schools.

A focus on critical learning areas can facilitate customised curricula; and local adaptations of curricula in partnership with staff, family and policy makers can reinforce the relevance of ECEC services to local children and communities. The project’s Moodle platform is available to all educators, interested in “L2L” and willing to improve in teaching and using effective methods inside and outside the classrooms all over Europe. This platform is an Open Educational Resource for all European teachers.

When and if policy makers accept this new methodological approach based on developing “learn to learn”, ECEC services in the local areas have the potential to be significantly increased in their quality. Partner schools can’t do it by themselves, but with the support of policy makers, it can be possible.

These recommendations are developed specifically for policy- and decision-makers and consist in:

- Descriptions of major obstacles European kindergartens face today
- The situation with funding in regards to development of ‘learn to learn’ in the partner institutions
- Suggestions on national legislation improvements

Major obstacles

1. Inadequate financial support for preschool classes, which leads to inability to respect all elements of valid educational standards (*Belgium, Croatia, Greece, Turkey*)
2. Shortage of staff (*Belgium, Turkey*)
3. The number of children in one class is over the proper number: more than 20 children in each class for only one teacher (*Belgium, Turkey*)
4. Insufficient accommodation capacity and/or improper physical conditions (*Croatia, Greece, Turkey*)

5. Insufficiently and inadequately landscaped outdoor areas and playgrounds (*Croatia, Turkey*) This prevents teachers to make necessary outdoor activities in order to enhance children’s gross motor development and make children familiar with the nature
6. The “M-decreet”: children with special needs are going to be more integrated in regular preschools. The problem is that the preschools don’t get extra support for these classes. Preschool teachers need to be experts on all kinds of levels: to be therapists, psychologists and so on (*Belgium*)
7. Parents have high expectations about academic education, while teachers try to also give attention to children’s social-emotional development, not just their academic achievement (*Turkey*)
8. Families’ conservative attitudes towards their children are also an obstacle for teachers. (*Turkey*)
9. Unqualified teachers (*Turkey*)
10. The curriculum should be more child-centered, rather than teacher-centered (*Turkey*)

Funding

The project authors believe that the situation concerning funding of kindergartens for proper development of “learning to learn” looks as follows:

Country	Belgium	Croatia	Greece	Latvia	Turkey
Adequate funding		✓		✓	
Inadequate funding	✓		✓		✓

Belgium

Preschools have only 2/3 of the budget of the primary school. Should there be more funds, the preschools would have:

- More than one teacher per class (for every 20 children)
- An extra person for childcare
- More hours for care coordinators
- More support on pedagogical level

The budget of kindergartens is barely enough to take care of the primary needs. There is no money to pay two teachers for every class. Therefore, there is too little time to work in small groups, which is required to work on “learning to learn” in classes.

Croatia

Funding for preschools in Croatia for further quality development of “learning to learn” is available, but it’s not all the same in the whole country, because it depends on the funding by the local community (which is not the same in rural country areas and big cities). Overall, the state of Croatia provides what is necessary for quality implementation of “learning to learn”, and differences within the country are dependent on the financial situation of each local community. Funds for the implementation of professional training are regularly provided and sufficient for quality training. Advocating managers of preschool institutions and creative professionals contribute to the continued exchange between teachers, enriching their everyday work and organizing the surrounding environment of the children.

Greece

There is not enough funding of kindergartens for proper development of “learning to learn”. Additional funds are needed to have bigger space at schools and a bigger variety of materials and tools, which are required for development of “learning to learn”.

Latvia

There is enough funding for development of ‘learning to learn’ when it comes to educational environment. Nevertheless, extra funds are required for educating preschool teachers and for stimulating their desire to organise their teaching differently.

Turkey

In 2015 budget division report one can see that 13, 38% of general budget is allocated for MEB (Ministry of National Education). During last 10 years there have been certain attempts for improvement in both general education system and preschool education. However, the least amount of budget still belongs to preschool education compared to other grades. Especially in public schools, substantial part of budget is used for staff and investment because providing more immovable things in classes, staff, equipment, and materials for preschool is thought more important than spending for curriculum or learn to learn development. Therefore, there is no separated budget for better curriculum, L2L or PBL development. On the other hand, private schools generally do not use their budget for learn to learn development studies, although they have enough facilities economically. Some and less private schools have special agenda and curricula that are based on PBL, child and nature centered; yet, there is no mention about “learn to learn”.

Suggestions on national legislation improvements

Since every country has their own educational legislation and a unique preschool education system with their own challenges, the recommendations for legislation improvement vary from country to country and look as follows.

Belgium

- A better funding of preschool education by the government
- Two teachers in every class, plus child care specialists for the groups with the youngest children in order to be taking care of them
- The number of children in a class shouldn't exceed 17 children
- Teachers need to put less time in administration and more time in preparing activities for classes

Croatia

The Croatian partner believes that their system of pre-school education is well-designed. The recently passed National curriculum document for early pre-school education confirms the value of good pedagogical practices and provides guidelines for further development. The Croatian government is preparing an announcement of reform that applies to all levels of education, which is believed to contribute to further the quality of preschool education. Nevertheless, the experiences the Croatian partner is gaining in European projects confirms the need to connect to the EU countries with a common goal, which is to improve the quality of preschool education.

Greece

- More rights to preschool headmasters
- In-service training for preschool staff
- Seminars for parents

Latvia

- Courses in theory and practical trainings for preschool teachers

Turkey

When we analyse the Preschool Education Regulations of National Education Ministry, there is a program that is child-centered, encourages thinking, aims developing problem solving skills. Children's gains in the program are prepared in the light of these points.

However, our National Education Preschool program does not cover Learn to Learn skills and Problem Based Learning. There is a little similar plan and implementations but these implementations don't include all requirements of L2L and PBL. Preschool programs and regulations should be revised by the L2L competencies and PBL methods.

There are some items in Preschool Education Regulations that can be arranged according to L2L and PBL. These items are mentioned below.



In the Preschool Regulation, there is a subtitle namely “attendance to course and activities”. In this title, one item mentions about developing cognitive activities, affective, psychomotor competences like critical thinking, problem solving, understanding what they read, and searching. This item should be enhanced by L2L competencies. L2L learning outcomes (search, collect, classify, finding similarities and differences, compare and contrast, elaboration of materials) should be included to the regulation items. (Appendix 1)

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In Preschool Regulation, in the project definition part, it is targeted to reach giving comment, getting new knowledge, producing authentic thinking and making inference. PBL methods can be added to this part of regulation and PBL is much related with this part.

6. LIST OF SOURCES

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