

Analysis of the Lithuanian policy context

mathematics and science for life



mascil aims to promote a widespread implementation of inquiry-based teaching (IBL) in math and science in primary and secondary schools. It connects IBL in schools with the world of work making math and science more meaningful for young European students and motivating their interest in careers in science and technology.





1.12 National report of Lithuania

PART 1: A DESCRIPTIVE, EVIDENCE-BASED ACCOUNT OF THE NATIONAL CONTEXT

Introduction: Organization of education in Lithuania

The educational system in Lithuania is comprised of:

- formal education (primary, basic, secondary, vocational, advanced vocational, and higher education)
- informal education (preschool, pre-primary, and other informal children and adult education)
- self-education aid to children (informational, psychological, social and special aid, and health care at the school)
- aid to teacher and school (informational, consulting, competence improvement and other).

Formal education is organized according to approved study programs. Under the ISCED 97 classification, educational system may be divided as follows:

- ISCED 0. This level does not belong to the formal educational system; anyway, preschool and pre-primary education belongs to this level.
- ISCED 1. Primary education.
- ISCED 2. Basic education.
- ISCED 3. Secondary education.
- ISCED 4. Postsecondary/vocational education.
- ISCED 5. Advanced vocational and higher education studies.
- ISCED 6. Doctoral, residence studies and postgraduate art studies.





Start date of a school year is September 1 and it lasts until May 30 (for younger schoolchildren) or June 30 (for elder schoolchildren and students). Usually school holidays in a secondary are in autumn (one week), during Christmas period (two weeks), on Easter (one week) and during summer (at least two months). In higher education and vocational training institutions holidays are on Christmas and during summer. Achievements are assessed on 10 point scale since the 5th grade. The teaching language usually is Lithuanian; anyway, ethnic minorities can choose a school with other teaching language: Russian, Polish, Belarusian and other. In higher education institutions teaching language is Lithuanian, except a few specific study programs which are fully in English, Russian, German or other language.

The scheme and detailed description of every level are presented below.

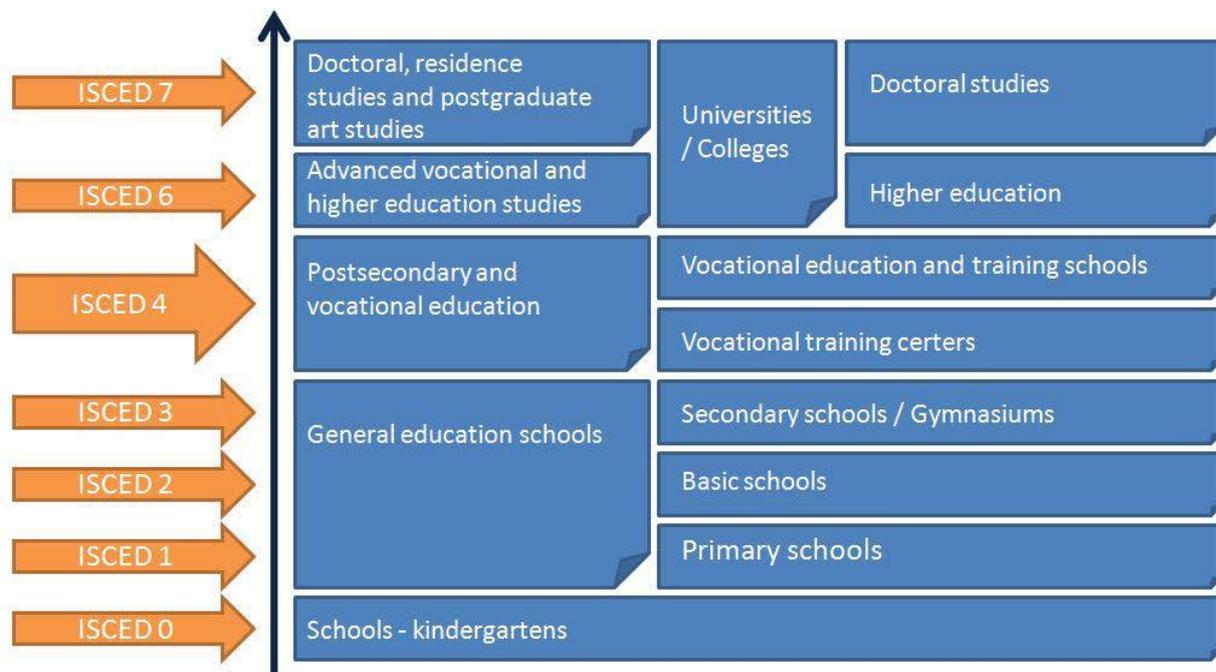


Figure 1. Lithuania's educational system



Pre-school	The pre-school programme is on offer for children aged from 5 to 6 at nursery schools, school nursery schools and primary school, is conducted by qualified teaching staff and is voluntary.
Primary school	School begins at the age of 6 - 7, primary school is for 4 year.
Basic school	The 4-year primary school is followed by 6 years of basic education. If a pupil is successful in the final examination, this concludes with a basic education certificate (the equivalent of the intermediate school leaving certificate in Germany).
Secondary school / gymnasium	<p>After completion of basic education, a two-year course of upper secondary education may be embarked upon.</p> <p>It is also possible to transfer to an upper secondary school upon completion of class 8, this school then continuing until class 12. In classes 11 and 12, pupils are permitted to select subjects in a targeted way in accordance with their personal interests and strengths.</p>
Vocational education and training (VET)	<p>Vocational education and training can be completed in vocational schools by young people from the age of 14. The training comprises the imparting of both theoretical and practical knowledge. Four types of training programme are differentiated.</p> <p>Type 1 For young people from the age of 14 who have not gained a basic education leaving certificate which forms the basis of vocational education and training. This framework also affords the opportunity of gaining the lower secondary school leaving certificate.</p> <p>Type 2 3-year vocational education and training for those who have gained the basic education leaving certificate. They acquire a VET qualification (skilled worker status).</p> <p>Type 3 For those who have passed the upper secondary school leaving</p>





	<p>certificate, 1 to 2 years of vocational training</p> <p>Type 4 For those who have passed the upper secondary school leaving certificate, 3 to 4 year course of training comprising higher education and occupational qualification. Some modules correspond to Bachelor level, and credit for these may be transferred to a later course of higher education study.</p> <p>Vocational education and training, however, is not very popular with young Lithuanians, since it provides only limited knowledge which is no longer sufficient on the current labour market in the form is imparted. Many young people wish to obtain more knowledge about work within the private sector or about self-employment.</p>
Higher education	<p>Lithuania has academic (universities) and non-academic institutes of higher education (colleges). Students gain entry via selection procedures which mostly involve consideration being accorded to marks obtained in the upper secondary school leaving certificate. Higher education is based on the European credit system. The duration of the course of study leading to the acquisition of a Bachelor degree (basic higher education study) is 4 years. This can be followed by a one or two year vocational qualification diploma, such as a teaching qualification or a Masters degree which in turn can be followed by a doctorate.</p>

Theme 1: State of affairs-recent changes

Wider policy perspectives

There no science and mathematics education priority excluded in educational policy documents in Lithuanian. However the main aim of „Strategy of ICT implementation into Lithuanian education 2005-2007“ and „Strategy of ICT implementation into Lithuanian education 2013-2022“ is to create digital content for education and expand modern





services for teaching and learning. By this aim there are implemented some national projects in relation with mathematics and science:

- Primary – ICT –based World knowledge for 1-2 grades, ICT –based World knowledge for 3-4 grades
- General secondary - ICT-based integrated course of natural sciences for 5-6 grades, ICT-based integrated course of natural sciences for 7-8 grades
- Upper secondary – Learning objects (LOs) for gymnasium. There are LO for mathematics, chemistry, physics and biology.
- Implemented LOM database with expanded metadata. There teachers can find learning object for every subject and every age of students.

Some general changes in science and mathematics curricula are excluded.

Primary and general education

Some general changes in the new primary and general secondary curricula are anticipated:

- The educational content has to be oriented to educate general and subject competencies, the main focus have to be on to learn.
- Education has to be individualized depending on students needs. The levels of student's skills for every concern (7-8, 9-10, 11-12, 13-14, 15-16, 17-18 years) are described.
- Integration of educational content has to be strengthened. The connections between educational domains, subjects, concerns are reflected in the description of student's achievements. The connections between subject programmes and social student's life are strengthened. The programme of enterprise and economy is introduced into social education. The new domain of general competencies and life skills coverage programmes (To learn, Communication, Regular growth, Health and life skills, Cultural consciousness) which are integrated into all subjects and non-formal education.
- All Subject contents have to be matched





- The main focus is on expected student's achievements. The student's achievements are described as whole of three competencies - attitude, skills, knowledge and understanding.
- The educational process has to involve students into active and deliberate learning; the active learning and teaching methods have to be used in the lessons. Teacher has to motivate students to think independently, to learn active and from experience. Students learn to actively collaborate with others, to have a look at new ideas, things, environments and technologies. The teaching have to stimulate students to ask, study, seek, test, analyze, solve problems, create.

In the relations with mathematics and science the main focus in mathematics learning is to help student to get mathematical skills which help to solve everyday life problems, to learn successfully, to interest in mathematics. The main focus in nature study learning is to help student to get general understanding of nature, social and cultural application, to understand how this application affects human life, to get skills to live in this application and to get positive world understanding and worth.

For general secondary education main focus is to get mathematical skills and knowledge by their individual intellectual and character features, which help them to be socialized – to learn and get trade. The main focus in integrated science learning is to give every student possibility to get general knowledge of science. The students get general concepts of science, get skills, which help to learn world and acquire worth. Students are prepared for further life as full-rate citizen which can to live healthy and to solve problems of sustainable growth.

Vocational education

The main focus of mathematics in vocation education is to make possibility for students to develop their mathematical competence: skills, to learn world, to describe it in mathematical models, apply mathematical methods to solve practical and theoretical problems of various science domains.

The main focus of science in vocation education is to make possibility for students to choose discipline of biology, chemistry or physics, to develop general competencies of





science, which are important for full-rate up-to-date life and to prepare for further studies.

Science and mathematics teachers' education

There are some changes in relation to initial teacher education. There more attention paid on pedagogical practice. The aim decelerated in strategy of education is to reach such pedagogical sociality level, when teachers and lectors are constantly improved and resulting working. The projects of ICT implementation in education are implemented in primary, secondary and vocational education. So there are in-service teacher training, when they are involved to participate in the national and European projects. But these trainings are organized for teachers of all subjects including mathematics and science too. Some of such projects in relation with science and mathematics are mentioned above.

Implementation in the classrooms

Subject hours

In general there no priority for mathematics and nature study subjects at schools. But there is different number of hours for each subject per year. In the table 1 you can see how many hours in each school is given for mathematics and since in the contact off all contact hours.

Table 1. General secondary and vocational school

	Primary school		General secondary school		Vocational school
	1-2 grade	3-4 grade	5-6 grade	7-8 grade	I-II years
Mathematics educational hours per two years	288	288	268	280	125
Integrated science educational hours	128	128	134	-	-





per two years					
Physics educational hours per two years	-	-	-	105	70
Chemistry educational hours per two years	-	-	-	70	70
Biology educational hours per two years	-	-	-	105	50
Total educational hours per two years (of all subjects)	1504	1600	1809	2065	2207

Teaching and learning methods

The educational process has to involve students into active and deliberate learning; the active learning and teaching methods have to be used in the lessons. Teacher has to motivate students to think independently, to learn active and from experience. Students learn to actively collaborate with others, to have a look at new ideas, things, environments and technologies. The teaching have to stimulate students to ask, study, seek, test, analyze, solve problems, create.

The teachers are encouraged to use active teaching methods. These methods are presented in the seminars of projects which were motioned above. The strategy of ICT implementation in education inspired to develop new digital material and technologies, which requires new teaching and learning methods. The national projects were implemented for this.





Assessment

Several projects have been implemented for primary education. The main aim of them was to modernize primary education by implementing innovative teaching methods and ICT. Six primary schools in Lithuania were involved to participate in the national project „The implementation of the model of primary school and vocational teachers to apply ICT and innovative teaching methods“. They have to present their good practice. The project touches all subject including mathematics and integrated science.

There were two big national projects in relation to integrated science: ICT-based integrated course of natural sciences for 5-6 grades, ICT-based integrated course of natural sciences for 7-8 grades. Thirty schools were involved to participate in these projects. The good practice of the schools and digital material of the projects is available for all teachers in Lithuania.

The assessment in our country is oriented to final decision about student knowledge and their fixation by mark.

The assessment of student's advance and achievements consists of two parts: assessment in the process of education and assessment of complete course, module, basic or secondary educational programme.

The assessment in the process of education consists of two types:

- Formative assessment and diagnostic assessment. Formative assessment helps teacher and student to anticipate direction and actions to prove student's advance. The teacher observes student's learning, comments, discusses and motivates students to assess their learning process themselves. This type of assessment is not connected to marks.
- The diagnostic assessment is to clear, if the tasks of learning are achieved, what help is needed for student, what are the subsequent learning steps. This type of assessment is applied usually before new learning stage (theme, part of course and ect.).

When student complete subject, module programme the generalizable assessment is applied. When student complete general educations (after 10th grade) they have Examination of basic education achievement in Lithuanian language, native language

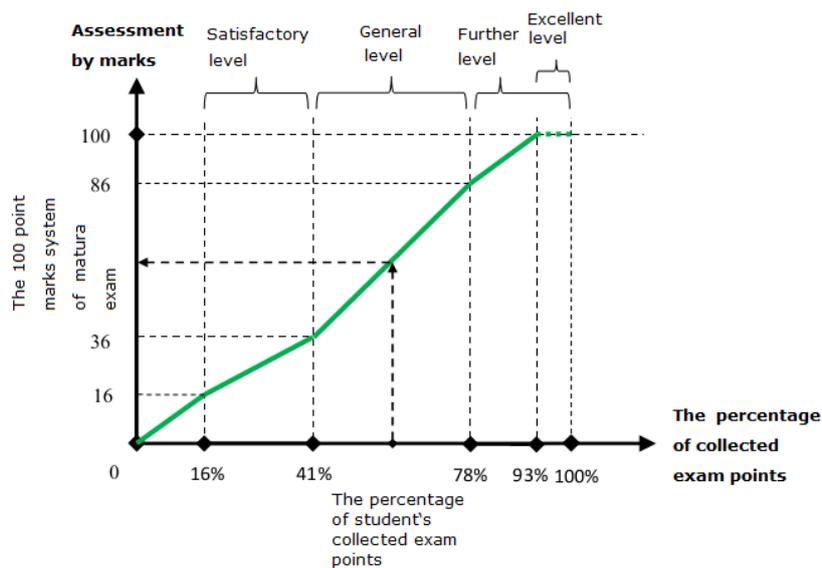




and mathematics. The results of this assessment are fixed by marks in 10th point system.

After completing secondary education programme they have matura exams. Matura examinations may be of two types, i.e. school-level or national-level. To be awarded a School Leaving Certificate, two matura examinations must be passed: a compulsory exam in Lithuanian and an optional exam. School-leavers who wish to enter institutions of higher education and receive state funding (except for the studies of Arts) must pass at least three matura examinations. In total, six matura exams may be taken.

The generalizable assessment is formal. The criterion-referenced assessment is chosen for mature exams assessment (see picture).





A student pass exam when he/she collects more than 16% of task points. Only the structure of two exams is different and the minimum percentage of collected task points are different from other exams: to pass Lithuanian language and literature exam student has to collect 30% of task points and to pass exam of information technology student has to collect 20% of task points

	The marks in 100 point system	Percentage of collected task points
Pass	86-100	78% - 100%
	36-85	41% - 77%
	16-35	16% - 40%
Fail	0-15	

State examinations are conducted centrally – school leavers are registered in the database of the National Examination Centre; examinations are taken in municipal examination centres; pupils are given coded numbers which are attached to their examination papers and the latter are sent to the National Examination Centre where they are assessed by hired experts. Having completed the secondary education programme and passed matura examinations, school-leavers acquire secondary education.

The vocational, higher or other schools use students' generalizable assessment to admit student.

There is no strong assessment in the primary school. The formative assessment is in the primary education.

Learning achievements in grades 5-12 in secondary schools as well as in the majority of higher and vocational education establishments are assessed as follows:

Outcome	Assessment	Description
<i>Pass</i>	10 (excellent)	Excellent, exceptional knowledge and competences
	9 (very good)	Solid, good knowledge and competences
	8 (good)	Knowledge and competences above the average





	7 (average)	Average knowledge and competences, minor mistakes
	6 (satisfactory)	Knowledge and competences (skills) below the average, mistakes
	5 (weak)	Knowledge and competences (skills) meet minimum requirements
<i>Fail</i>	4, 3, 2, 1 (unsatisfactory)	Failing minimum requirements

Constrains in relation to the aims of the mascil project

The educational system is oriented to academic and theoretical approach in our country though national curricula decelerate the new view of educational content, process and teaching methods. But in reality students are prepared to pass matura exams. Most of exams require to remember a lot of material but not to solve problems. When students pass exams they forget most of unnecessary theoretical information. From the other side teachers cannot “play“with students with active methods or interesting life material because teachers have to prepare students for theoretical exams.

The aims in the national strategies, curricula and programmers show that Mascil aims has implication in Lithuanian education. For several years innovative, active teaching methods and interesting new material were introduced to teachers through implementing national projects inspired by national strategies of ICT implementation in education.

Theme 2: Schooling and the world of work

Wider policy perspectives

There is no priority of the connection between general education and the world of work, but Lithuanian educational system makes conditions to acquire skills of world of work by attending additional activities after lessons.





After classes, pupils can choose various leisure activities provided in schools free of charge or attend separate sports, music, fine arts, art, aviation, and choreography schools, and children's clubs. The latter activities are partially paid; professional artists, sportsmen, and teachers work with children.

In schools, pupils can be excused from attending weekly classes in Arts and Physical Training, if they have graduated from art schools or study Fine Arts, Choreography, or Music in art schools or non-formal education establishments specializing in sports. The long-term artistic education program completed in children's music, art, and sports schools or any other school can be recognized as a vocational education module.

As defined by the Vocational Guidance Act (2012) the main educational institutions that provide guidance services (career education, information and counseling) to their learners are general education schools and Vocational educational institutions. Municipalities are responsible for organization and coordination of guidance services at schools at municipal level. Nationwide vocational guidance is coordinated by the Lithuanian Students' Non-Formal Education Centre. The centre is responsible for methodological assistance and advice to schools and educational support agencies and is involved in training career guidance staff. It ensures accessibility to modern guidance and counseling tools, and participates in nationwide monitoring of guidance services for learners.

With the Centre of Information Technologies in Education, the Lithuanian Students' Non-Formal Education Centre is responsible for providing quality information on learning opportunities and career planning on the main national web portal on learning opportunities, AIKOS (<http://www.aikos/smm.lt>). It is an open information, guidance and counseling system, which addresses students, employees as well as guidance and counseling personnel. It informs on education and training programs, providers, qualifications, occupations, admission rules, classifications, education and employment statistics and gives other information.

Other education institutions (pedagogical and psychological services, education support agencies, etc.) are involved in providing guidance services to the extent this is related to their functions and actual guidance needs of learners. The Education Exchange Support Foundation administers the Euro guidance project and disseminates information on good practice examples in Lithuania and other European countries, new methods,





creates various guidance and counseling tools and organizes training seminars for guidance practitioners.

The main aim of national curricula of primary and secondary school is to develop individual's spiritual, intellectual, physical force, educate active, creative, responsible citizen with competencies which need for social integration and life-long learning.

Some skills which are listened in science and mathematics curricula for primary education can be referred to world of work. For example, the students have to improve their science skills to understand, manage, analyze and interpret various kind of information, such as to apply acquired knowledge and experience, to think critical and solve problems.

The students have to develop their skills to communicate and collaborate by the mathematics curricula of secondary school. The students have to improve skills to held hypothesis, to plan experiments, to use laboratory safely, to do conclusions, to evaluate them. The students have to acquire science sense and responsible view to environment by investigation of physical nature phenomenon. These skills described in the secondary school curricula also van be referred to world of work.

The conditions to obtain general education in Vocational education and training (VET) institutions

As explained earlier, learners have possibilities to acquire lower and upper secondary education together with vocational qualifications. Also, from 2000, through accreditation of upper secondary general education programs, upper secondary general education departments have been set up at IVET institutions.

Technology subjects and VET modules in general upper-secondary curricula

Learners in general education can deepen their knowledge on technologies in certain fields and develop their practical skills to acquire at least partially, the necessary skills for a vocational qualification. In 11th and 12th grades they may choose among the following fields: textile and clothing; applied art, crafts and design; tourism and nutrition technologies; construction and wood processing; business, management and retail trade; mechanics and repair. Also, some general upper secondary curricula include VET programme modules. When learners continue their studies in VET, the above-mentioned fields and VET modules are recognized as part of their VET programme.

Technology as part of the matura exams





Since 2010, a technology subject has become part of the matura exams at the end of upper secondary general education. The exam in a technology field may be taken by learners in general education and by those in VET and it can replace an exam in a general education subject field.

Incentives for youth

VET to acquire a first qualification is free of charge. IVET learners may receive a student grant and other material support. Based on data of the Education Information Technologies Centre, around 70% of IVET learners received such a student grant in 2011. Socially disadvantaged learners who do not receive the grant are provided free meals and other material support.

Learners who live outside the learning institution are provided with hostel accommodation. Based on data of the Education Information Technologies Centre around 99% of those who need hostel accommodation receive it.

Issues regarding schools/institutes

As stipulated in the Law on Vocational Education and Training (1997, new edition - 2007), the Lithuanian VET system covers initial VET (IVET), continuing VET (CVET) and vocational guidance (please see below for more information about vocational guidance).

VET programmes are designed for different age and educational background students. Initial VET is intended for the acquisition of a first qualification. In IVET, students are provided with opportunities of acquiring a qualification and completing general lower or upper secondary education.

CVET is designed for the improvement of a person's existing qualification, acquisition of a new qualification or gaining a competence needed to implement specific jobs (functions) as regulated in legal acts.

From 2002 VET curricula in Lithuania are competence-based, with clearly defined training objectives. IVET programmes are developed by VET providers in cooperation with representatives of employers. When developing programmes, the providers follow





VET standards and general requirements approved by the Minister for Education and Science. Formal CVET is implemented following national programmes.

In initial vocational education and training, the following vocational education and training (VET) programmes included in the study and training programmes and qualifications register are provided at:

- (a) lower secondary education level not leading to a basic education certificate;
- (b) lower secondary education level leading to a basic education certificate;
- (c) upper secondary education level for learners having completed basic education, not leading to upper secondary general education;
- (d) upper secondary education level leading to upper secondary general education;
- (e) post-secondary education level for learners having completed upper secondary general education.

Average study duration, qualification certificates and further learning and career opportunities are summarized in Table:

	International standard classification of education level	Average duration	Certification awarded	European qualifications framework	Further learning and career opportunities
Programmes at lower secondary education level	2C	2-3 years	Vocational qualification certificate	2	Access to labor market
Programmes at lower secondary education	2A	3 years	Vocational qualification certificate; basic	2	Further training in VET institutions or general





level			school certificate		education school; Access to labor market
Programmes at upper secondary education level	3C	2-3 years	Vocational qualification certificate	3	Access to labor market
Programmes at upper secondary education level	3A	3 years	Vocational qualification certificate; matura certificate	4	Access to higher education/college or university study programmes; Access to labor market
Continuing vocational education and training	2,3,4	Up to 1 year	Vocational qualification certificate	1,2,3	Access to labor market

Learners without general lower or upper secondary education have an opportunity to acquire it together with a vocational qualification. Thus VET programmes help to bring early school-leavers back to education and training. After completing general upper secondary education and having acquired a vocational qualification, VET learners may continue their studies in higher education. In recent years, conditions to access higher education have been improved for successful VET graduates.

Formal VET providers

The Law on VET stipulates that a VET provider may be any VET institution, a freelance teacher or any other provider (general education school, enterprise, organization whose main activity is other than VET) entitled to develop and implement VET programmes. VET providers may accept learners and provide formal VET programmes after receiving





a licence from the Ministry of Education and Science. VET institutions may have licences for both IVET and CVET.

According to Statistics Lithuania, in 2012, there were 75 initial vocational education and training providers; 72 were public. In addition, 260 institutions, whose main activity is other than VET, have licenses for Continuing vocational education and training.

The mathematics and science

Mathematics and science disciplines are in separate subjects:

<i>Programme</i>	<i>Course</i>	<i>Mathematics</i>	<i>Biology</i>	<i>Physics</i>	<i>Chemistry</i>
Vocational education with basic education		125 hours per two years	50 hours per two years	70 hours per two years	70 hours per two years
Vocational education with secondary education	General course	207 hours per two years	138 hours per two years	138 hours per two years	138 hours per two years
	Extended course	316 hours per two years	207 hours per two years	246 hours per two years	207 hours per two years

VET in Lithuania is school-based; however, practical training and training in enterprises constitute the major part of the training. For example, in IVET practical training comprises 60-70% of the total time allocated to teaching vocational subjects, of which 8-15 weeks is organized in a company or a school-based workshop simulating working conditions.

A new edition of the Law on VET legitimates apprenticeship as a form for VET organization. However this training form is rarely applied in practice. In 2013 it is foreseen to allocate national and European structural funds for special projects for the apprenticeship development.

Social partners participate in shaping the content of new qualifications, qualification standards and VET programmes, in assessing that VET programmes correspond to the





labor market needs and in organising practical training. They also take part in organizing and implementing assessment of qualifications.

The aim of non-formal student education is to meet student's needs to know, to educate, express themselves and become active members of society. The purpose of non-formal education is systematically develop knowledge of particular domain, improve abilities and skills, to give additional competencies by long-term programmes.

Schools of general education allocate 4–5 hours per week for extracurricular activities of children. These hours are financed out of the student's basket and are used by schools to organize club activities, studies and other additional educational activities. Extracurricular education is not compulsory and is elective. Art and sport studies were the most popular types of extracurricular education.

After school, learners may choose to attend schools of non-formal education for children, i.e. music, art, sport, etc. Studies at these schools are not totally free and the founder of a particular school defines the tuition fee.

Issues regarding classrooms

The national curricula do not support topics in science and mathematics education in relation to the world of work in general education.

A qualification is awarded to a person who has obtained all the competences required as defined in the respective VET standard or sectorial qualifications standard; or, in the absence of these, in a VET programme included in the study, training programmes and qualifications registers. Evaluation of the competences acquired by IVET graduates is detached from the training process. From 2003 to 2012, organization of the final assessment was delegated to social partners (such as chambers of commerce, industry and crafts or agriculture). In 2012, a new regulation delegated assessment of competences acquired through formal, non-formal, work-based or informal learning to specifically-accredited institutions. These include social partners. By the end of 2012, 10 institutions were accredited.

Qualifications are awarded by VET providers once they have obtained the assessment results. Graduates whose competences are considered sufficient to receive a qualification are issued with vocational qualification certificates showing the respective LTQF/EQF levels.





Learners, who complete lower secondary general education together with a VET programme, are awarded a vocational qualification and a basic education certificate; VET learners who complete upper secondary general education and pass school-leaving examinations are awarded a vocational qualification and a matura certificate, which allows access to higher education. Those who fail to complete the general education programme or pass the school-leaving examination are awarded a certificate of learning outcomes.

Constraints in relation to the aims of the mascil project

The vocational education is most approached to world of work and IBL. In 2010, a relevant project started in line with the VET resources development programme, based on experience of pilot projects. In cooperation with employers and their organisations around 100 training programmes in 12 sectors of the economy are foreseen to educate 650 VET teachers and college lecturers with state-of-the-art technological equipment.

Theme 3: Science and Mathematics curricula and IBL

Wider policy perspectives

Primary education

The general aim of primary schools is to prepare for the development of an educated, independent and active personality. It seeks to do so by the following means:

- creating conditions conducive to the growth of each child's individuality;
- imparting the basics of culture (intellectual, aesthetic, ethical);
- imparting knowledge and fostering the ability to analyse and interpret it;
- developing all ways of acquiring learning that are relevant to a person's life, and his or her relations with society at large.

Secondary and vocational education. The general priorities to develop students' creativity and to involve students into active and deliberate learning are related with IBL





and are prioritized in national curricula of Lithuania. But the academic approach is still priority in secondary education because students have to pass matura exams.

Issues regarding schools/institutes

General secondary education. Vocational education

Science teachers implements priorities related with IBL by active teaching methods recommended in curricula: projects, experiments, long time observation, research, seek for information by interview, internet, and libraries. These methods lets proceed from teaching to learning.

Mathematics teachers can use creative works or integration with other subjects.

Issues regarding classrooms

General secondary education - Vocational education

There two domains which are integrated in all mathematics curricula: problems solving and skill to learn mathematic and to interest in mathematic. Most of science topics can be taught with IBL.

The mathematics skills related with IBL:

- The students understand about management of problematic situations is formed.
- Students learn to evaluate what knowledge and skills they need to solve problem by steps.
- Student achieve experience how to offer several solutions and choose one, how to seek purpose, how to held and test simple hypotheses, how to study and evaluate prior knowledge and skill in the context of new one.
- Student have to want and be prepared to learn mathematic actively and independent; to see the practical use of mathematic knowledge and skills in everyday life; to see mathematics usage in other subjects, professions.





- The teacher forms student's view to mathematics learning as interesting and significant activity; as tool for critical thinking, general problems solving, communicating and collaborating.

The students' skills of science education described in the national curricula convey the priorities of science education related with IBL:

- Students recognize and classify the most important living and non-living natural objects and phenomena, observe consistent patterns, understand and apply basic science concepts, laws and theories, purposefully use characters of sizes and dimensions, solves a simple practical problems in science, apply acquired science knowledge and skills in solving everyday problems;
- Students held questions and hypotheses, plan observation and experiments and safely use laboratory tools and materials, do experiments, summarize data, evaluate their accuracy and reliability, formulate conclusions on the findings;
- Students are interested in a variety of organisms, identifies major groups of organisms, understand significant of their adaptation to the environmental, basic life processes, the principles of a healthy life;
- Students explore a variety of materials, recognize them, describe their use and distribution in nature, classify their properties, notes material variation consistent patterns;
- Students study and analyze physical phenomena of living and non-living natural, develop scientific world view and a responsible attitude to the environment, nature and life;

Students are interested in science and technology in Lithuania and in the world, priorities of science in our country on direction of engineering and technology development, learn about careers that require science knowledge and skills.

Constraints in relation to the aims of the mascil project

There are mentioned in the policy documents, but in reality is not so good. So, we need examples, tasks and involve teachers.





Theme 4: Pre-Service teacher training in relation to i) IBL and ii) the world of work

Wider policy perspectives

These competencies are priority for teacher training.

The Description of the Professional Competences of Teachers (Description) regulates the competence groups, competences and abilities related with the professional activities of teachers within the framework of the programmes for pre-school, preparatory, primary, basic, secondary, and relevant special education, vocational training, and non-formal education of children.

The professional competences of teachers include the cultural, professional, general, and special competences:

Cultural competences means knowledge, skills, capabilities, value attitudes, and other personal qualities that determine a successful activity of a person in a particular culture(s);

Professional competences means the knowledge, skills, capabilities, value attitudes, and other personal qualities of a teacher which are necessary in order to pursue a successful general educative activity not specified in accordance with the content centres/areas of education.

General competences means the knowledge, skills, capabilities, value attitudes, approaches, and other personal qualities that are necessary for the activity of teachers and may be transferable from one type of activity into another.

Special competences means the knowledge, skills, capabilities, value attitudes, approaches, and other personal qualities of teachers which determine their successful performance within a certain content centre/area of education.

Since 2010, students who enter pedagogical studies have to take a motivation test. The motivation test enables the institutions to select the most motivated students. Future





pedagogues with the best achievement results receive an incentive - an additional target grant of 400 litas (approx. 115 euros).

Implementation

Teachers in Lithuania are trained by pedagogical-profile and some non-pedagogical-profile universities and colleges. Teachers are trained at colleges (providing non-university study programmes of higher education) and universities (providing basic professional study programmes; Bachelor's and Master's degree study programmes and also specialized professional study programmes).

Teacher training in Lithuania follows two models: the concurrent model (when all components of the initial teacher training curriculum are combined from the outset) and consecutive model (when professional training, i.e. studies in educational subjects, methods of teaching and pedagogical practice in school, enabling students to qualify as teachers follow academic studies). In some teacher training institutions, elements of modular or integrated models may be evidenced. Teachers for pre-school and primary education institutions and social pedagogues are trained only under the concurrent model. In Lithuania, the teacher training model has several common curriculum components: studies offering educational programmes, academic studies in subjects and certain disciplines related to school education programmes, subject or integrated study course methodology and pedagogical/school practice.

Under the concurrent model, the study programme in the field chosen is combined with the programme of professional teacher training in the corresponding field. On completion of the programmes, graduates are awarded a Bachelor's degree and the qualification of a teacher (pedagogue).

Specialized professional studies include two blocks of equal value: academic studies and pedagogical practice. The studies at the University comprise three stages. The first stage offers basic (Bachelor's degree) studies. The Bachelor's degree studies last four years (five years in the event of extramural studies). Upon completion of those studies, students are awarded a Bachelor's degree and/or professional qualifications. The second stage offers Master's degree studies. Upon completion of those studies, students are awarded a Master's degree and a professional qualification of a gymnasium teacher. The duration of studies at that stage is two years. The third stage embraces doctoral studies that last four years.





Full-time students are provided opportunities to seek a teacher's qualification in some other subject by following evening or extramural study programmes. Teachers who work at schools without the necessary professional qualification or efficiency in the subjects they teach may acquire it through full-time, evening or extramural studies and also through distance learning upon acquisition of the necessary knowledge by following a specialized professional study programme and upon completion of a graduation paper (project). Their positively evaluated pedagogical work in an educational institution is recognized as their school practice.

The duration of university basic studies is four years in full-time (daytime) studies, four years in part-time (or evening) studies and 4–5 years in extramural (or distance) studies. Specialized professional studies last 1–1.5 or 2 years in full-time (daytime) studies, or 1–2 years or 1–1.5 or 2 years in part-time (or evening) studies. The duration of studies for a Master's degree is 2 years (in full-time (daytime), part-time (evening) or extramural (distance) studies). In colleges, full-time (daytime) studies last for three years and extramural (or distance) studies four years.

The purpose of school practice is to assist future teachers in acquiring experience, competences and skills necessary for practical pedagogical work to do the teacher's work at a base school for a definite period of time or perform various functions of the teacher's professional activities. The school practice is recommended to comprise at least 20 credits* and, in the event that teacher training follows the concurrent model, begin from the first year of studies.

Primary pre-service teachers' training.

The pre-school education study programmes are aimed at training specialists in compliance with the standard requirements designed for educators of children in the pre-school age group, i.e. educators with the necessary professional competences to nurse and educate young children of the pre-school age group in various educational institutions.

Initial teacher training in childhood pedagogy, childhood pedagogy (specialized programmes), pre-school education and music and pre-school and pre-primary education is provided at university basic studies upon completion of which graduates obtain Bachelor's degree and qualifications of educators and teachers. Master's studies are offered for people wishing to become pre-school pedagogues and educators with





Master's degrees and also obtain a Master's degree in childhood pedagogy. Pre-school pedagogues (educators) are also trained at specialized professional studies of universities.

Pre-school and primary school pedagogues are also trained in accordance with non-university study programmes alongside the concurrent model of teacher training. The scope of the studies in pre-school and primary school teacher training varies between 120 and 160 credits. On completion of the study programme, graduates obtain a Bachelor's degree in applied education studies and a certificate attesting to the completion of pedagogical studies. Pedagogues of pre-school education (educators of pre-school educational institutions) may also be trained at colleges.

The pre-school education study programme is aimed at training primary school teachers with the necessary qualifications to fulfill the requirements contained in the teaching plans and curricula for primary grades, to organize supplementary education and work according to their chosen specialization.

University basic studies train pedagogues for primary grades (holders of Bachelor's degrees and teachers). They offer programmes to train pedagogues who can teach primary grades and one or another subject. Master's studies offer training for pedagogues of primary education (holders of Master's degrees and teachers). Special studies offer training to pedagogues (teachers) for the early teaching of English.

Pedagogues (teachers) for primary education are trained at colleges.

Subject teachers training- Vocational pre-service teachers' training

Pedagogues to teach various subjects and also special and social teachers are trained in accordance with university study programmes alongside both concurrent and consecutive models of teacher training.

University basic studies train teachers in various subjects of general education, holders of Bachelor's degrees; teachers of vocational training, holders of Bachelor's degrees; teachers of music and performing arts, holders of Bachelor's degrees; Bachelors in education studies and teachers.

Upon completion of studies designed to train pedagogues in a single discrete subject along the concurrent model of teacher training, persons obtain a Bachelor's diploma attesting to the acquisition of a Bachelor's degree in the study field comprising the basis





of the relating discrete subject and also a certificate attesting to the completion of pedagogical studies.

The scope of the studies varies between 180 and 240 credits. Upon completion of studies designed to train pedagogues in two discrete subjects along the concurrent model of teacher training, persons obtain a Bachelor's diploma attesting to the acquisition of a Bachelor's degree in the study field comprising the basis of the relating discrete subjects and also a certificate attesting to the completion of pedagogical studies. The scope of the studies varies between 240 credits..

Persons who have been awarded a Bachelor's degree but have no certificate attesting to the completion of pedagogical studies can acquire the professional competence necessary for a subject teacher by following university (pedagogical) study programmes. The scope of such studies is 60 ECTS and a certificate attesting to the completion of pedagogical studies is granted upon their completion.

Upon completion of the programme in a certain study field at university basic studies, persons may work as subject specialists in general education and special schools or as lecturers in colleges and higher educational institutions as well as continue studies for Master's degree by following didactic or educational programmes.

University Master's studies offer training for subject teachers, holders of Master's degree. Upon completion of university Master's degree educational programmes in a certain study field, graduates may undertake Doctoral studies in the same study field or education studies (didactics); they may also work as subject specialists in general education schools, lecturers at colleges and universities or get employed at research and educational institutions.

University specialized professional studies offer programmes for training specialists in general subjects for basic and secondary schools or gymnasiums and also lecturers for colleges.

Lecturer in universities and colleagues

A doctorate is required for anyone wanting to achieve full professor status at an institute of higher learning. A master's is required to begin a career as a lecturer. There are four distinctions of staff in the universities of Lithuania. The lowest teaching position is that of the Asistentas (Assistant). A master's degree is required and research activity is





preferred to obtain this position. The second type of instructor is known as the Vyresnysis Asistentas (Senior Assistant). This senior position of teaching is held without a doctorate and can be occupied for two terms. There is no opportunity to teach master's students in this position and research activity is required. A docent (Associated Professor) should hold a Docentas (doctorate) or educational award. The highest level of teaching position is known as the Professorius (Professor). A person holding this position must obtain the highest scientific degree or highest educational award available. A number of publications are required, in addition to a leading position in a branch of investigation performed at the department of study.

The Law on Education has established a six-part set of rights for its educators. According to Article 23, teachers have the right to:

1. Freely choose the manner of organization of teaching activities
2. Improve their qualification and receive a corresponding salary in accordance with the established order
3. Suitable working conditions
4. Yearly prolonged vacations (48 working days)
5. Take part in the self-government of state educational institutions provided that they are not employees of the administration of that institution
6. Join social organizations

In addition to the set of rights a teacher possesses, the educator is also bound by a set of duties. Teachers must:

1. Develop the students' norms of morality and guarantee safe and sound development of their personal abilities
2. Aim to make development programs comprehensive for the pupils
3. Adhere to the principles of pedagogical ethics
4. Participate in activities outside of school in order to further develop the cultural and personal interests of the pupils
5. Improve their qualifications
6. Cooperate with the parents and guardians in settling questions of a child's





education

Every teacher educator is usually responsible for their own module/course. Every course/module aims and objectives ought to correspond to the aims and objectives of the study programme. The requirements for teacher education study programmes are stated in Act of Science and Study, Regulation for Initial Teacher Training, Teacher Training Standards. If there are some modules relating to inclusive and/or special needs education, equality and diversity in study programme, the main responsibility for the teacher competencies in this area fall on lecturers of these modules. When higher education institutions have more resources (for example more specialists who work in the area of inclusive and/or special needs education, equality and diversity) these specialists are invited, as having the best expertise, to work in study programmes for teacher education and to have specific courses in inclusive and/or special needs education, equality and diversity.

Non-traditional studies

- Distance higher education. Course programmes are conducted by transmitting to the student specially prepared learning materials through the postal services. Various virtual environments were introduced and are developed by universities.
- Lifelong higher education. The Ministry of Education and Science has licensed 90 institutions to offer non-formal studies. Around 700 institutions are listed in the Register of the Ministry of Economy for adults and others. These include 63 state-owned companies, 288 joint-stock companies, 271 individual companies and 46 foreign investment companies. In addition, special departments for adult training have been set up in the universities. The courses offered include training and retraining, particularly in the fields of pedagogy, psychology, special or additional education etc.

Teachers' voice

No data available at this point





Constraints in relation to the aims of the mascil project

Our country is not big and innovative teachers are known. We invite these teachers to participate in the project. We contact them by email. These teachers have to be representative in their schools and contact with their school leaders and other teachers.

We think that it is possible to solve tasks related with world of work in the class and after lessons, to do some mini-projects. The connection between school and the world of work can be realized in such way. But more it depends on teacher's decision

Theme 5: In-Service teacher training in relation to i) IBL and ii) the world of work

Wider policy perspectives

The Description of the Professional Competences of Teachers (Description) regulates the competence groups, competences and abilities related with the professional activities of teachers within the framework of the programmes for pre-school, preparatory, primary, basic, secondary, and relevant special education, vocational training, and non-formal education of children.

The professional competences of teachers include the cultural, professional, general, and special competences:

Cultural competences mean knowledge, skills, capabilities, value attitudes, and other personal qualities that determine a successful activity of a person in a particular culture(s);

Professional competences means the knowledge, skills, capabilities, value attitudes, and other personal qualities of a teacher which are necessary in order to pursue a successful general educative activity not specified in accordance with the content centres/areas of education.

General competences means the knowledge, skills, capabilities, value attitudes, approaches, and other personal qualities that are necessary for the activity of teachers and may be transferable from one type of activity into another.





Special competences means the knowledge, skills, capabilities, value attitudes, approaches, and other personal qualities of teachers which determine their successful performance within a certain content centre/area of education.

Vocational training

The priority area for professional development of VET teachers is updating their technological competences. In 2010, a relevant project started in line with the VET resources development programme, based on experience of pilot projects. In cooperation with employers and their organisations around 100 training programmes in 12 sectors of the economy are foreseen to educate 650 VET teachers and college lecturers with state-of-the-art technological equipment.

Implementation

During an academic year, teachers have to allocate five days for the improvement of their skills. Every municipality has a teacher education centre, in which teachers can upgrade their qualifications. These services are also provided by various private institutions.

There is a system implemented for the teacher performance appraisal. The Regulations of the Teacher Performance Appraisal specify four teacher qualification categories: teacher, senior teacher, teacher-supervisor, and teacher-expert.

Main institutions which are responsible of the in-service teacher training are: The ministry of education and science, The center of teacher competencies, The center of teacher professional development and other institutions which are under the Ministry of education and science.

1. The ministry of education and science:

- Sets priority for qualification development directions of school headers, their assistants, teachers and other
- Gives funds for institutions of qualification development
- Initiates the pursue of national qualification development programme and give fund for it





2. The center of teacher's competencies

- Observes the quality of school headers, their assistants, teachers and others qualification development
- Organizes accreditation for institutions and programmes of qualification development
- Announces information about institutions and programmes of qualification development which get accreditation
- Gives methodology for institutions of qualification development and for programme developers.

3. The center of teacher professional development

- Organizes programmes of qualification development, projects by the strategy action plans of ministry of education and science and by demand of qualification development of the employees of educational institutions
- Prepares consultants of education and develops their qualification
- Coordinates methodical activity of teachers and school, prepare methodical tools, collects and spreads methodical material
- Prepare lecturer, which can propagate innovation of education

Teachers' voice

Most of asked teachers participate in teaching training over the past year. And most of training was related with innovations.

The purpose of in-service training for most teachers is to get new experience, knowledge and skills, and use them in their work. Most of teachers want to participate in teacher training because they want to be a modern teacher, want to know all innovations in education: innovative methods of teaching, modern learning objects; but interdisciplinary integration; it is very interesting to get acquainted with the teaching situation in other countries, with teaching experiences of colleagues.





Most of teachers uses IBL in some ways in their lessons: students choose learning content according to their capabilities, they define problems, solve them and present their work for friends and teacher; pupils make enquiries about the characters of turtles (in imagine Logo), ask questions, and plan tasks; students have mini projects which are inquiry based; students work on projects, analyse their results, discuss possible ways of improvement.

Teachers agree that relation between schooling and world of work is important for students, but some of them doubt that implementation of work of world in general secondary school is good idea. But most of them agree that vocational education together with basic or secondary education is good choice for our student.

Constraints in relation to the aims of the mascil project

The in-service teacher training is important for our country. Teachers are innovative and search for new effective teaching and learning way. Over last year the main attention was on ICT implementation in educational system from administrative work to teaching and learning. There were some national projects, when interactive content was developed for mathematics and science as well as for other subjects. All teachers had to acquire ICT competencies. Also there are number of teachers which participated in ICT implementation project and implemented new content in their classes. Then they evaluated this content. So, there is some relation with the mascil aims in our country.

For the mascil project innovative schools will be asked to participate and the teacher of these schools will be taught in the classes. They will be asked to involve IBL and world of work in their lessons by using tasks presented in mascil. The teacher consulting will be provided all the time.

PART 2: EMERGING ISSUES FOR REFLECTION

Equity specific issues

From the PISA results the basic ability in science and mathematics in Lithuania in relation to boys and girls is not significant.

There no priority in gender differences in learning science and mathematics and for tackling gender inequalities, but in national policy is mentioned about gender equality:





Law on Education; Law on Men and Women equality; Strategy on Ensure of Men and Women equality; The Program of gender equality

Law on Men and Women equality, article 4 states that "Educational institutions, scientific and educational institutions have to implement gender equality" and the institutions obliged to:

- guarantee women and men equal conditions for admission to professional educational institutions, universities, developing professional skills and providing practical work experience; allowing scholarships and according credits for studies; selecting curriculum; knowledge assessment.
- to ensure that in educational curricula and textbooks are not promotion of gender discrimination.

Yes, training in IBL approaches takes into consideration gender differences in terms of interests, learning styles, motivation

Addressing low achievement

There are group of student with special needs. The special mathematics and other programs are written for them. But they are integrated in normal classes (Law on Education).

Teachers' professional development cover issues on how to tackle low achievement.

Training in IBL approaches makes specific reference to students that under perform.

Promoting entrepreneurship

National strategies or initiatives addressing the implementation of entrepreneurship education into genera education at primary and secondary level: The strategy of education of economic literacy and enterprise (2004). This strategy includes general school curriculum and educational process changes and additions in order to implement the economic literacy training and entrepreneurship.





Comments by the NAB

We talked to the experts from Education Development Centre, a state educational institution which provides educational support for students, teachers and for school (<http://www.upc.smm.lt/veikla/about.php>) as well as specialist for teaching Mathematics at the Ministry of Education and Science of Lithuania. They highly support inquiry-based learning and are happy to support the Mascil promotion to school teachers. Also we discussed with teachers and policy makers at the national conference held in Siauliai September 19-20, 2013 about the project and active teaching/learning methods in schools.

We have selected candidates of NBA and discussed with them by individually. We are going to arrange meeting next month and officially establish the NBA.



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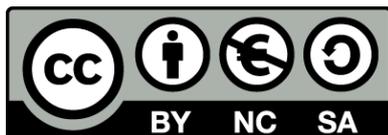
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