



Erasmus+

Good practice guide for

**“Health Information Systems training and certification
implementation for higher education” (HIS4HE)**

Project No. 2016-1-LT01-KA203-023177

Contents

1. Introduction	4
1.1. The project “HIS4HE”	4
1.2. Who are these guidelines meant for?	5
1.3. Aims of the guidelines	6
2. Summary of research	6
2.1. Research goals and activities	6
2.2. Stakeholder’s description	7
2.3. Collection of existing curricula and programs in the field of health education	7
2.4. Collection of the data about most used and typical health information systems	7
2.5. Beneficiaries skills level and training needs evaluation by the Focus group	8
2.6. Conclusions and recommendations	11
3. Training, testing and certification methodology	12
3.1. The general description of the training circle	12
3.2. The target group	12
3.3. Training methodology and organization	13
3.3.1. The learning materials	13
3.3.2. Training methodology and organisation	16
3.4. Certification of skills	17
3.4.1. The role of certification	17
3.4.2. The ECDL eHealth certification test	18
4. Implementation of “Health Information Systems trainings and certification implementation for higher education” pilot trainings and certification	19
4.1. Latvia	19
4.2. Lithuania	24
5. Conclusions and recommendations	26
5.1. Summary on training organization. The main conclusions	26
5.2. Recommendations on further use of the developed material and organisation of teacher training process	26
6. Project partner profiles	26
Kaunas University of Technology	26
Latvian Information and communications technology association – LIKTA	27
DZC	28
Public institution Information Technologies Institute (ITI)	29
DLGI	29





1. Introduction

1.1. The project “HIS4HE”

Training for Health Information Systems and certification implementation for higher education (HIS4HE) project is meant to meet the needs of medicine students in higher educational schools and the labour market as well as users of patient data systems, such as doctors, nurses and all types of healthcare support staff.

In today's everyday life and all kind of workplaces Information and Communication Technologies (ICT) has become more and more important. *“The digital age is expanding into all areas of our lives, and it is not just those who work in IT that will need to be alert of the digital transformation. The digital skills gap is real. While already 90% of future jobs require some level of digital literacy, 44% of Europeans lack basic digital skills.”* said Mariya Gabriel, EU Commissioner for Digital Economy and Society.¹

A great number of actions have been taken by the European Commission (EC) in order to help people that are willing to achieve digital skills, to actually acquire digital knowledge and skills – especially in the workplace. Offering suitable online courses with an international or at least national acknowledged valid certification can be a big step towards good and tailored competences for all kind of medical stuff – from medical students to specialized health professionals.

To achieve this goal it is important to create e-courses to train all interested users of computers and smart devices in order to encourage them to gain skills for safe internet and e-services usage.

Health workers need to receive digital skills training at every single level of their education. Only advanced digital skills can assure that high quality services can be delivered to patients in future.

According to the “Digital Agenda for Europe” (<http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52010DC0245R%2801%29>) one of the most important areas is sustainable healthcare and ICT-based support to allow a dignified and independent living. It is recognized, that “the deployment of eHealth technologies in Europe can improve the quality of care, reduce medical costs and foster independent living, including in remote places. An essential condition for success is that these technologies incorporate the right of individuals to have their personal health information safely stored within a healthcare system accessible online. To exploit the full potential of new eHealth services, the EU needs to remove legal and organizational barriers, particularly those to pan-European interoperability, and strengthen cooperation among Member States.” The Digital Agenda for Lithuania (2014-2020) states, that “there is currently a lack of good quality, personalized patient health-related electronic services and ICT products. In order to provide the residents with modern electronic services, to guarantee the collection of accurate, comprehensive patient electronic data, it is very important to introduce ICT in the national healthcare system.” The Kaunas University of Technology helps to achieve this goal by introducing the Health Informatics study programme in 2015. This joint programme is provided together with Lithuanian University of Health Sciences and the main objective is to educate specialists, having knowledge of public health and informatics, capable of designing, developing and deploying software for solving healthcare issues. The graduates will have a solid knowledge of programming and information systems; will know the challenges, terminology, and

¹ http://europa.eu/rapid/press-release_IP-18-102_en.htm

organizational aspects of healthcare. Besides that candidates learn about IT-security in general in order to have a wider view on problem solving using IT. Through specializations, the program will allow to focus on developing e-health information systems and data analysis; or deepen the biomedical knowledge and specialize in developing personal mobile IT health solutions.

Kaunas University of Technology as the main provider of this study programme, is therefore very interested in high quality Health Information Systems (HIS) oriented course(s), which would allow deepening the knowledge and enhancing the skills of students and medical staff in this area. HIS course would be very suitable for the E-Health technologies specialization of the Health Informatics study programme. At the moment there is no specific HIS module in the Programme to cover this area. There are several information system development s related modules but presented seperatly. They are from the KTU and healthcare management, and quality related modules provided by the Lithuanian University of Health Sciences. Therefore, Kaunas University of Technology is very interested to include HIS study module in its current and future study programmes and acknowledges its demand and benefits for the quality of studies provided.

In Latvia there is a great shortage of health informatics specialists. Health informatics courses are only offered and organized by private training organizations. Datorzinibu Centrs has been selected as project partner for the most extensive experience in such training.

The project aims to use the knowledge standard applicable in Europe (the ECDL Health, specifically). ECDL defines the HIS curriculum content shown in a syllabus that covers the most important and common areas. It considers the required and necessary leveasl of knowledge and skills and helps ensure module studies/training quality. At the same time, the implementation of a recognized standard could help to recognize the existing qualifications of HIS professionals in Latvia and Lithuania on an international level. The ECDL HIS certification modules and tools in Lithuania and Latvia will be implemented and run by ITI and LIKTA respectively.

The partner DLGI has already implemented ECDL Health certification and training in Germany. DLGI will share knowledge and experience in this field to support the project in a mentoring manner to make project localization and implementation activities a success for everyone.

It is planned to examine health sector ICT needs and trends, develop an integrated solution of HIS studies module, e-learning and online knowledge assessment tool, covering the training objectives described in module syllabus. The learning material will cover safer ICT, key principles and policies in relation to patient confidentiality, knowledge about the structure and main functionality of HIS and knowledge how to access patient records securely, to retrieve, navigate and document patient data and to report appropriately. It also provides essential basics of data protection, which provide necessary knowkedge for those who deal with personal data due to the new GDPR. All learning products will be implemented for partners in Latvia and Lithuania activities, and offered to national higher education/VET institutions and presented for other European countries educators by ECDL products marketing line.

1.2. Who are these guidelines meant for?

The present guidelines are dedicated for those which would like to introduce the target audience and stakeholders to project outputs, will get information about piloting results, best practices of piloting, and a methodology of applying the tools for teacher training, testing and certification.



Guidelines are also dedicated to organizations that would like to implement project results and improve medical students and medical staff about HIS and safe ICT usage.

1.3. Aims of the guidelines

The main objective of the Guidelines for implementation of HIS4HE is to present experience how HIS4HE training course can help participants improve their HIS knowledge and skills, and know how to work safely in their workplace.

The implementation process is derived from project partners' experience in the participating countries from Lithuania and Latvia.

2. Summary of research

2.1. Research goals and activities

The Project research on HIS usage in health organizations and VET training needs was carried out in order to use for HIS learning module and certification tools development and localization. The research was divided in two segments. One segment focused on existing education programs offered by educational institutions that integrate new medical information technologies into the course curriculum. The other segment focused on online health information systems that are available for medical staff to use and integrate in their daily work procedures. Research on health sector needs in HIS training in partner countries was considered successful. Indicators of achievement in this regard were represented by the percentage of different groups represented in the research, as well as the responsiveness of different stakeholders and their participation in the research. Target groups or main stakeholders were involved via focus group interviews.

The analysis was carried out by implementing following activities and steps:

- **Stakeholder's description** – to describe in a standardized way the stakeholders that will be involved in Focus group interviews.
- **Collection of existing curricula and programs in the field of health education** – the output will be used for HIS learning module and certification tools development and localization.
- **Collection of the data about most used and typical health information systems** – the outputs of this phase of the research will provide context for the most used and typical health information systems (HIS).
- **Focus groups interviews** – to gather the opinions from organizations and experts who are stakeholders in the health sector.

The research was leaded and coordinated by LIKTA; Lithuanian partner Kaunas University of Technology was involved in following tasks:

- commenting and reviewing the research methodology;
- providing an analysis of existing curricula and programs in the field of health education, as well as most used and typical health information systems;
- identifying the main stakeholders and inviting them to respond to Focus groups interviews.

2.2. Stakeholder's description

The aim was to describe in a standardized way the stakeholders that will be involved in Focus group interviews. In focus groups interviews was intended to include representatives from hospital administration, IT department of hospital, HIS software providers' expert, health studies provider, health industry employer (doctors and nurses), Ministry of Health, mass media and others. The template includes short description of stakeholder's competence and role in the organization and health sector as well as possible contribution to the HIS4HE project research and further activities.

Project partners filled the template according to the knowledge from desk research in Lithuania and Latvia.

2.3. Collection of existing curricula and programs in the field of health education

The objective of this phase of research was to identify existing curricula and programs in the field of health education including IT-based systems in patient care. The output was used for HIS learning module and certification tools development and localization.

Using the template for Collection of existing curricula and programs in the field of health education partners gathered data relating to:

- General partner organization information, including name, country and reporter email address.
- Information about organization where exists curricula and programs the field of health education including IT-based systems in patient care.

Current situation in Latvia

When it comes to integrating HIS into course curricula, Riga's Stradina University (RSU) has the most to offer. However, the level of integration varies. Some programs have an entire course dedicated to information technologies while some programs barely mention any new technology updates. Although most courses focus on technology in terms of practical use of equipment, courses like Introduction to Medical Instruments and Systems involves the more computerized information aspect of technology. All of these courses are part of a curriculum for obtaining a professional Bachelor's degree in the medical field.

Current situation in Lithuania

There are multiple professional Bachelor programs in health across Lithuania that offer some insights into information management technology as part of gaining a medical degree. However, similar as in Latvia, the IT course is considered of lesser importance and mostly covers the technology in place and how to use it in practice. Nonetheless, some universities offer Master's programs that directly connect information technologies with healthcare.

2.4. Collection of the data about most used and typical health information systems

The outputs of this phase of the research provide context for the most used and typical health information systems (HIS). The output was used for HIS learning module and certification tools development and localization.

Using the template for Collection of the data about most used and typical health information systems partners gathered data relating to:

General partner organization information, including name, country and reporter email address.

Information about existing policies and overview of the national e-health strategy:

- Information about fundamental rights, protection of personal data.
- Information about the existing HIS (most used and typical):

Current situation in Latvia

The Latvian Republic has implemented a single electronic health information system, or e-health system. The online platform is used by medical institutions, pharmacies and State residents. Aside from e-Health system, there are many other HIS platforms that medical staff can use to store patient data in a more safe and technology-savvy environment. All of the online information systems require basic computer knowledge to be able to operate. While most platforms provide on-site training and “help” sections, the lack of basic computer knowledge is possibly the biggest challenge blocking a fully successful integration of HIS into the daily world of medicine in Latvia.

Current situation in Lithuania

The purpose of an online eHealth System in LT is similar to that of their Latvian neighbor - to create conditions for more efficient, more qualitative and accessible health services via continuous information gathering, data exchange, and interoperability and information security. Lithuanian residents, regardless of time, geographical or institutional barriers, can access their health records data electronically via eHealth portal - the person receives information on the visits, prescriptions, immunization schedule, postings, can also subscribe to the appropriate certificates, and register with a preferred doctor. There are also many other HIS platforms that medical staff can use. Overall, the integration of online HIS into the medical field in Lithuania faces the same challenges as Latvian professionals – lack of computer knowledge. It is clear that there are multiple opportunities to computerize medical practices; the success of it lays vastly on the opportunities of training in using such systems.

2.5. Beneficiaries skills level and training needs evaluation by the Focus group

In order to evaluate medical staff and students’ level of knowledge of Health Information Systems and related IT topics as well as to identify main training needs the Focus group interviews were carried out in both countries. In focus groups interviews was intended to include representatives from hospital administration, IT department of hospital, HIS software providers and/or developer, health/medicine studies provider, health industry employee (doctors and nurses), Ministry or public agencies of Health, mass media and others.

The analysis is drawn from a questionnaire that was distributed to a focus group to gather the opinions from 9 organizations and experts who are stakeholders in the health sector in Latvia and 6 experts in Lithuania. The questionnaire consists of general information about the respondent’s background, their knowledge of existing IT systems in patient care, previous exposure to such systems, as well as respondent’s opinion on security threats and importance of designing a HIS learning module and certification tools.

Each stakeholder’s answer to which HIS or healthcare related e-services is he/she using was largely depending on his/her background. Respondents who are not directly exposed to any of the HIS

mentioned above, for instance, a project development manager and a docent have indicated that they are not using any healthcare related e-services, in spite of being aware of their availability. All interviewees agree on the necessity of basic computer skills and internet knowledge to use any of the healthcare related E-Systems.

Current situation in Latvia

First and foremost the questionnaire establishes the background knowledge of IT based systems in healthcare. It invited experts to identify the most popular systems the respondents are aware of. The most widely-known IT based systems in Latvia are E-health (e-veseliba) and Doctor's Office (Arsta Birojs). Programs such as Blue Bridge, Smart Medical, Meditec were mentioned, as well, however, those are merely developers and providers of various Health Information Systems, not actual software for medical staff to use at work. On the other hand, ProfDoc Medical Office was mentioned by several respondents, this is an advanced electronic medical record system which is designed to be a totally paperless professional tool for handling documentation of any patient's care given, clinical administration, workflow and all medical correspondence. Multiple stakeholders also mentioned internally used systems that they recognize as IT based health systems.

Current situation in Lithuania

The most widely-known IT based systems in Lithuania are PBI IS - National e.Health service and collaboration infrastructure information system, IPR – Patient registration in advance, SNOMED CT - Lithuanian Healthcare Terminology, Telemedicina, Information System „Licensing of Pharmaceutical practice” and register of pharmaceutical products (VAPRIS), National medical image archiving and exchange information system MedVAIS, Information Systems of other local hospitals, NKSPS - National clinical decision support information system and SANTA-HIS.

The primary user group for the systems mentioned above includes doctors, nurses and administrative staff at private practices, as well as public health institutions. Hence, an additional user group includes everyone else exposed to these health systems, for instance, IT professionals, insurance companies and governmental institutions, such as National Tax Office and National Social Insurance Agency.

Respondents were asked how important is it to take timely action for providing the ICT training of specialists in the health sector (1 – not important, 5 – very important), to which 78% agree that it is “Very important” (see Fig. 1).



Fig.1. Importance to provide ICT training of specialists in the health sector

When asked if respondents think HIS security issues are clear enough for users of HIS, 34% of respondents answered “No” and 33% answered “Rather no”. Not a single interviewee answered “Yes”, however, 11% said “Rather yes” and 22% answered “Hard to say” (see Fig. 2).

Do you believe the HIS security issues are clear enough for users of HIS?

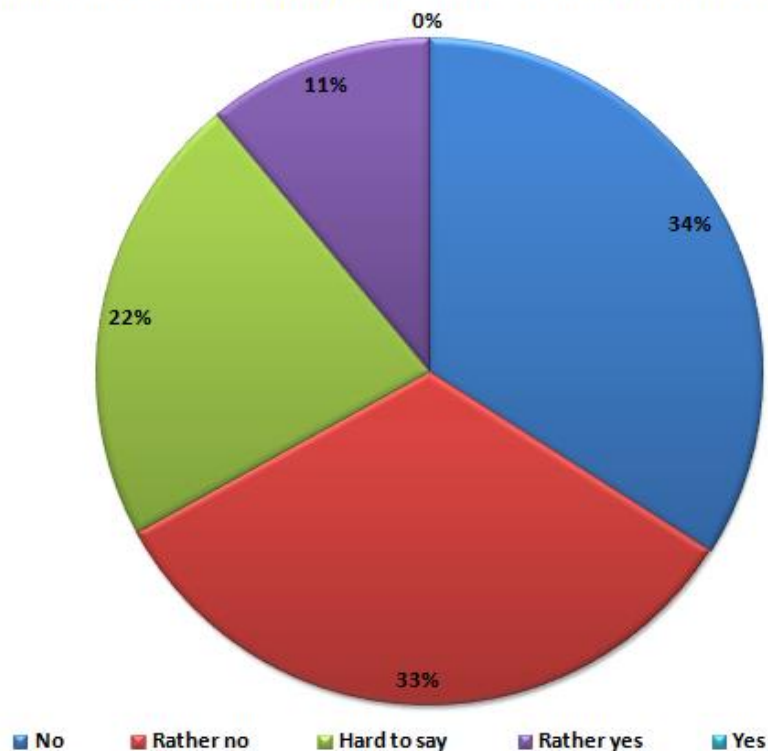


Fig.2. HIS security issues clearness for users

Further, the respondents were asked to evaluate the importance to design HIS learning module and certification tools in specific knowledge areas, such as HIS types, confidentiality, access control, and navigation (1 – not important, 5 – very important).

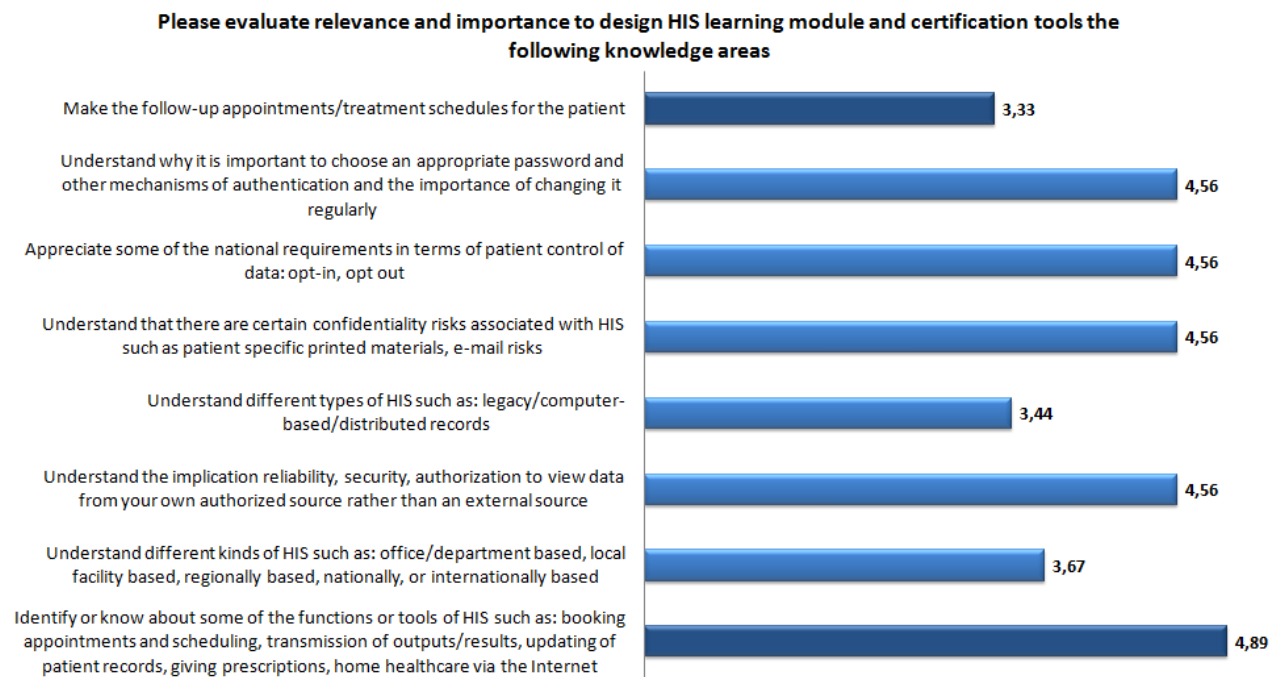


Fig.3 Importance to design HIS learning module and certification tools in specific knowledge areas

The most important by the highest average of 4.89 was considered identifying or knowing about some of the functions or tools of HIS such as: booking appointments and scheduling, transmission of outputs / results, updating of patient records, giving prescriptions, home health care via the Internet. Whereas, making follow-up appointments/ treatment schedules for the patient was considered of the lowest importance - on average 3.33 (see fig. 3).

2.6. Conclusions and recommendations

- There are multiple study programs in both Latvian and Lithuanian educational institutions that cover some IT based background knowledge in regards to the medical field. However, the concepts presented are part of general IT knowledge that is necessary for operating an ordinary computer system or any medical machinery that is computerized. There is a major lack of specified education programs for Health Information Systems and their integration into medical industry.
- The medical staff in general lack not only specific skills and knowledge of HIS, but also general digital skills, particularly such as security and personal data protection, online collaboration and cloud applications.
- Another observation can be drawn from this research about the personnel that can potentially be in most contact with such IT based systems. The existing HIS users are medical staff, ranging from doctors and nurses to medical front desk personnel, as well as drug store staff and individual patients. Every existing Health Information System is different and works for a different purpose, hence, covers different target user groups.
- Although the information systems at hand cover various target groups, the main disadvantage is the lack of knowledge and IT skills within these potential user groups. This problem can be solved with massive training incorporated within the medical staff, drug store staff and any other potential group of users. The training can be introduced in the

concept of short-term courses for personnel already in place providing the necessary knowledge and insights for HIS integration. In addition, such courses could be re-occurring after a certain period of time to revise and refresh the existing skills, as well as add new information if a certain HIS undergoes an update.

- The same suggestion can be applied to medical education institutions. Existing medical education programs must integrate courses about e-health systems, or have certain courses cover the material as part of their curriculum. This allows future medical professionals to receive necessary IT training before they leave the classroom, hence, be prepared to work with HIS once they enter the medical field.
- In order to ensure that the acquired training and education is of the highest quality and fits the most recent standards, it's recommended that such programs integrate a certificate-based knowledge assessment after finishing the course/program. For instance, the ECDL certificate module can serve as a template for such certification. ECDL is the most adequate solution for certification in both countries.
- The most requested training directions for the target beneficiaries to be presented in HIS4HE project Syllabus and training modules are considered the following :
 - General and Specific skills to use particular HIS and their functionality
 - Secure and safe use of HIS systems
 - Risks related to protection of patients data and their privacy

3. Training, testing and certification methodology

3.1. The general description of the training circle

The objective of the project "HIS4HE" is to facilitate of development of health care specialists' knowledge about health information system. To reach this aim the project team designed, developed and piloted a training and certification system for health care specialists and e-Facilitators that includes the complete set of learning and testing tools:

- Curricula;
- Online learning environment;
- Courseware - E-learning materials and an e-course;
- Self-assessment tests;
- Online certification module "HIS4HE Health Information System";
- Guidelines for implementing the system for teachers.

The main goal of the developed training cycle is to organize the learning process as a complete circle that begins with the selection of the target group and participants' preliminary knowledge and skills assessment. This stage is followed by training process, when the participants are involved in various learning activities using a variety of training methods and forms.

Training should lead to successful certification in the "HIS4HE Health Information System" test .

At the end of the training cycle, participants have gained new knowledge and skills to be used in the everyday life at work.

3.2. The target group

Participants could be health education students and health sector staff like doctors, nurses and healthcare support staff, etc.

There are 2 levels of beneficiaries that will be impacted by the training: the primary target group and secondary target groups.

The primary target group includes

- Health education students
- Health sector staff like doctors, nurses and healthcare support staff.

This target group will benefit from participation in training and certification, which will improve their knowledge and competencies in the labour market.

The second target group are both health institutions, as well as the corresponding VET institutions responsible for health care sector staff' skills upgrade and their professional development, mostly different players in the health care system: health care centres, hospitals, health care education centres, Ministry of Health care. They will be able to access and use the developed resources.

The target group selection principles

Although formal criteria (mentioned above) for the selection of participants are important, it is essential to consider their previous knowledge and experience, as well as their willingness to engage in the training.

The following aspects should be taken into account when inviting participants to join the training program:

Participant's ICT skills.

It is required that course participants have basic digital literacy competences, like computer essentials and online essentials skills.

Self-discipline

Taking into consideration that the training process is based on a blended learning concept where participants are required to work independently using online training materials and carrying out various tasks, it is crucial to have the tasks done in time to successfully acquire all the material and proceed to the certification of the acquired skills.

3.3. Training methodology and organization

3.3.1. The learning materials

The curricula and courseware include such chapters as: Introduction, Concepts, Confidentiality, health Information Systems usage, Common Information Technology knowledge, Computer and Internet security, Organizational and workplace security.

- The curriculum and the corresponding training materials are designed with the objective that at the end of training participants know about:
- Concepts of Health Information Systems, their role in the different levels of the healthcare system;
- The benefits and risks of using health Information Systems;
- Insuring confidentiality while using Healthcare Information Systems
- Basics of data protection and security issues when working on a computer and on the internet;
- Data protection and security protocols in an organizational framework.



By achieving these learning aims participants will be prepared for the ECDL Online Collaboration Tools in Education certification test.

The content

The blended learning course is organised in two Modules that are each based on different methodological concepts according to the content that is facilitated.

Module 1 – Health Information Systems Module is meant to raise participants’ awareness about the use, benefits and risks of health Information Systems, and the concepts of Health Information Systems structure and application.

Module 2 – Workplace security Module is intended for the acquisition of practical knowledge of online and organizational data security and safety issues and its application in an everyday work process.

Each Module consists of sections or topics. At the end of every topic there is a self-evaluation test. Participants are obliged to mark the materials read and complete the self-evaluation tests.

Module 1

In the Health Information Systems Module the participants learn about the health Information Systems conceptually – why and how they can be applied and what the users should be aware of. Therefore, this Module meets the participants on a basic level and provides knowledge on all competences that are important for both participation in the second Module and for the ECDL tests. Module 1 is introduced with a face-to-face class in the beginning. Some of the content of the first Module can be already discussed in the face-to-face meeting, others are left up to the participants individually acquainting themselves with the course material. The blended learning concept offers the opportunity to present various topics already in Module 1, for instance, the essential learning environment is the e-learning platform which is part of the content in Module 1.

Requirements for supervision: Module 1 is demanding in regard to the content and at the same time farthest away from the daily work of healthcare professionals. Therefore, it is essential that participants are motivated or a trainer (in the case if a group is organized, and there is a trainer leading the group. Not the case of individuals entering the course and learning individually) strongly supports and motivates participants. Furthermore, participants in Module 1 learn to work within the platform, where group learning can be beneficial, due to a common support system, thus emotionally relieving the anxiety or stress connected with starting an unknown endeavour. The trainer has, therefore, to promote individuals work and coordinate it, if necessary. It is essential for the whole course that the participants identify both with the learning objectives of the course and with their individual goals in order to stay motivated and stay in the course until the end, while actively fulfilling the course demands and keep on track with the materials.

Passing criteria for Module 1: In order to finish and pass a Module the participants have to read and mark all of the reading material within the Module. All of the self-evaluation tests after each of the topics should be completed successfully.

Time investment: Module 1 is designed for three weeks in total. The estimated time investment for participants per week is two to three hours. Participants who are not experienced working with digital media could need more than that, depending on whether it is the orientation within the

platform or the reading of digital text that they find challenging; the estimated time investment for trainers is four hours at the beginning of the course. Additional time investment can be demanded if participants reach out for assistance in the duration of the course, however that is not formally included in the course structure.

Module 2

In the Workplace Security Module the participants learn about the wider and broadly applicable concepts and practices of computer and data safety on the internet as well as on a daily basis in the workplace. It is designed to be on a level where all of the participants, regardless of their experience in computer usage or professional duties or specificities, can apply it regularly, both in the role of an advanced or a basic level user. It provides knowledge on all competences that are important for both extra context to the first Module, as well as for the ECDL tests. Some of the content of the second Module can be already discussed in the face-to-face meeting, the rest is left up to the participants individually acquainting themselves with the course material.

Requirements for supervision: Module 2 is demanding in regard to the content but at the same time is most likely very corresponding to the reality and practice of all of computer users, regardless of professional specifics of healthcare professionals. It is essential for the whole course that the participants identify both with the learning objectives of the course and with their individual goals in order to stay motivated and stay in the course until the end, while actively fulfilling the course demands and keep on track with the materials.

Passing criteria for Module 2: In order to finish and pass a Module the participants have to read and mark all of the reading material within the Module. All of the self-evaluation tests after each of the topics should be completed successfully. The ECDL test at the end of the module and course has to be completed successfully.

Time investment: Module 2 is designed for three weeks in total. The estimated time investment for participants per week is two to three hours. Participants who are not experienced working with digital media or are not familiar with digital safety practices could need more than that, depending on whether it is the orientation within the platform or the reading of digital text that they find challenging; the estimated time investment for trainers is three hours at the end of the course, including the time needed for completing the ECDL test. Additional time investment can be demanded if participants reach out for assistance in the duration of the course, however that is not formally included in the course structure.

The availability

The developed e-course is available in three languages: English, Latvian and Lithuanian. It is hosted on a Moodle platform <https://open.ktu.edu>.



Health Information Systems (HIS4HE)



Health Information Systems training and certification implementation for higher education (HIS4HE) project addresses the education and labour market needs of medicine students in higher education schools, users of patient data systems, such as doctors, nurses and healthcare support staff, etc.

Course is designed for existing and future health sector professionals seeking to develop and certify their qualification in HIS usage. In the sectoral perspective, target group is health students and trainers. In labour market perspective, implementation of ECDL Health module will increase professional qualifications of young health specialists and help meet health sector requirements.

The project is founded within the Erasmus+ program of the European Commission.

More information about the project at <http://www.ecdl.it/his4he>



3.3.2. Training methodology and organisation

Training process is organised using a blended learning method: organizing one or two face-to face trainings and independent online learning supported by trainer.

Method	Duration	Themes
Face-to-Face or online meeting	1 st week: 1 Day training	<i>Introduction</i>
Unit 1		
Online training	1 st week – 2 nd week	<i>Introduction to HIS</i>
		<i>HIS concepts</i>
		<i>Confidentiality & Security</i>
	3 rd week	<i>HIS usage</i>
		<i>Policy & Procedures</i>
Online Workshop	3 rd -4 th week: 1 hour	Consultations
Unit 2		
Online training	4 th week	<i>Common IT security knowledge</i>
		<i>Computer security</i>
		<i>Internet security</i>
	5 th week	<i>Workplace IT security</i>
Online Workshop	5 th -6 th week: 1 hour	Consultations
Face-to-Face meeting	6 th week: 1 half day course closure	<i>Knowledge certification, Feedback</i>

It is advisable that the participants spend 2 to 3 hours a week in order to get familiar with reading materials and complete self-evaluation tests. Course participants should have possibility to have a support from trainer: ask for help, ask to explain appropriate training material topics, receive feedback, recommendations and etc.

Introduction face-to-face workshop

First face-to-face or online meeting is dedicated get know each other and to introduce main information about the training course. During this session trainer by using presentations should



explain about project, e-course, demonstrate how to connect and use moodle environment and introduce about knowledge certification after trainings.

Online training/E-learning

Participants by using moodle environment start training according to the online modules. There are two modules Health Information Systems and Workplace security which are splitted into smaller topics. At the beginning, participants can read about this course and how to use Moodle. Each topic is splitted into subtopics by using book type. The subtopics of content are available on the right side of the window, which allows to read only actual information.

Each topic has self-assessment test, which can be taken many times. When participant will read all training material and perform all self-assessment tests, he will be ready to take the certification test.

Online workshops

It is recommended to organise online workshops during the trainings. During the online workshops participants can share experience about trainings, explain problems which could be occurred during the online trainings, identify problems with training material or self-evaluations questions and etc.

Final face-to-face workshop

The final face-to-face meeting is mandatory, because participants will take the certification test. After the test participants should fill in the evaluation questionnaire about the whole training process, training material, self-evaluation test and certification test.

3.4. Certification of skills

3.4.1. The role of certification

Certification provides objective verification of an individuals' skills and demonstrates their competency to a recognised standard.

Specifically, certification offers the following benefits:

- It defines the set of skills that people need to be effective in their roles;
- It provides a means to assess workforce skills and build a training plan;
- It proves that individuals have the skills to carry out their work competently;
- It increases overall efficiency and productivity;
- It offers a clear measure of the return on investment in training;
- It works as a motivator for people to complete the training.

In the context of the HIS4HE project, certification acts both as a focus for participants' work as they progress through the programme, and incentivises completion. Candidates know that not only will they have taken part in an effective training programme, but they will have an independent validation of their abilities if they meet the required standard.

One of the main certification components in the project is the ECDL Health information system usage module. This is certification module that has been developed by ECDL Foundation, a not-for-profit organisation focused on providing certification programmes that assist individuals to develop



digital skills. ECDL Foundation has engaged with more than 14 million individuals in 150 countries.

3.4.2. The ECDL eHealth certification test

At the end of training participants took ECDL Health Information System test.

The ECDL HIS4HE Health Information System module consists of a syllabus and certification tests developed by HIS4He project team and approved by ECDL Foundation. This module sets out concepts and skills relating to the setup and use of Health information system usage, including concepts of HIS, HIS types, confidentiality, security, HIS usage, Common IT Security Knowledges, Organisational Workplace Security, Computer security, Internet security.

The test has been adapted to an online testing environment by Lithuanian partner ITI and localized into Lithuanian by ITI and Latvian by LIKTA. According the ECDL Foundation requirements HIS4HE Health Information System test's questions should correspond to the question test base provided by ECDL Foundation and should consist of at least 4 sets of questions. Every set should have 36 questions. Therefore at least 144 questions should be prepared.

There are two types of questions in question base:

- multiple choice questions, where only one of the four answers is correct;
- hotspot questions (questions with an interactive image), where the correct answer has to be marked in the picture.

HIS4HE Health Information System test questions are presented in plain language and are easy to understand for candidates from various backgrounds. The output of test reflects the stated skill or knowledge-based goals of the ECDL HIS4HE Health Information System Syllabus.

A formal expression of this characterization is summarized as follows:

- The test experience is unthreatening for the test taker.
- The test taker has ample time to complete the test.
- The test should be accessible to all.
- There are no trick questions.
- The certification test has a high pass mark consistent with a competency-based test.

Test and question items are designed with this characterization in mind and are evaluated in the context of these criteria.

One test consists of 36 questions that have to be taken in 45 minutes. The pass rate is 75%. The tests are loaded and delivered through an automated test engine.

4. Implementation of “Health Information Systems trainings and certification implementation for higher education” pilot trainings and certification

4.1. Latvia

Participants’ information and selection process

Participation was offered and invitations were sent to one organization – a physical rehabilitation centre. It was chosen due to its professional activity profile – an array of health-related services is offered there, and the vast majority of the staff are required to handle personal data on a daily basis. The management of the Centre were sent information about the project alongside a request to send the invitations to a mixed group of employees with different specificities of their position and everyday tasks. This was done to ensure, that the program was tested on a variety of professionals, each having a specific set of needs. The participants profile ranged from doctors to administrative employees. A total of 26 people applied for the course.

Participants’ profile

An overwhelming majority of the course participants were women (96%) – out of the initial 26, only one (4%) was male.

Approximately a third (32%) of the participants were between the ages 46 and 55. Participants of the ages 26-35 and 36-45 were 24% and 28% accordingly. Only one person was younger than 25 and three (12%)- older than 55 years of age.

Age	Started	Completed
<25 years	1	1
26-35 years	6	6
36-45 years	7	5
46-55 years	8	8
55 and older	3	3

Majority of the participants had a notable experience working in the medical field. Two thirds (68%) of the people partaking in the program had been working in the field for more than 10 years – 32% had an experience spanning 11-20 years and 36% had been in the field for more than 20.

1 to 5 years	8
11 to 20 years	8
More than 20 years	9

Almost half of the participants (41%) indicated that administrative responsibilities were either the main focus or a significant part of their job. Administrative workers were the biggest part of the group – 32%, while doctors and nurses represented 23% each.

Administrative worker	7
Administrative worker, occupational therapist	1
Doctor	4
Doctor, Administrative worker	1
Physiotherapist, orthopaedist	3
Nurse	5
Social worker	1



Participants' motivation to join training and previous experience in the training area

The selection of the participants was internal – it was left up to the management of the Centre and the employees themselves (only noting the recommended group size and the capacity of the classrooms), so a significant say on the final group makeup was the management's view on the needs and requirements of the employees as well as the internal company policy.

Most of the participants joined the program due to the recently implemented personal data protection regulation and a nation-wide health information system (E-veselība), that has affected the daily operation of the Centre.

Since the participants were picked by the management, people chosen were ones that practically handle personal data and work with different information systems daily.

Participants' pre-training skills assessment

Participants were asked to self-evaluate their computer skills in a short questionnaire, given to them at the beginning of the first class. It contained questions on subjective evaluation aspects, such as evaluating their overall feeling and comfort-level, when working on a computer, as well as a more specific approach – asking to identify operations they are able to perform. Most of the participants assessed their skills as good and commented that they felt comfortable performing usual tasks. Also, the questionnaire included questions on the job practice and habits of the individual, like the frequency computer and internet use as well as knowledge or experience with data handling, information systems, etc.

Self-assessment of basic skills when working on a computer	
Limited, I don't feel free while working, I oftentimes face difficulty	1
Medium, I don't feel free, but can perform the necessary	4
Good, I feel free while performing usual tasks	15
Very good, I feel free performing various tasks	4

The frequency of computer use	
3 -5 times a week	1
Every day, less than 2 hours	1
Every day, more than 2 hours	23

Internet usage frequency	
3 -5 times a week	3
Every day, less than 2 hours	4
Every day, more than 2 hours	18
Assessment of basic computer skills	
Open/Copy/Move a document or folder	24
Writing and editing text	24
Reading data from external memory - CD or flash drive	20
Adding auxiliaries (for example, connecting a printer to a computer)	15
Handling files, compressing them	11
Handling tables, performing calculations	14

Self-assessment: the ability to work on the Internet	
Using a search engine	24
Sending and receiving Email	25
Sending e-mails with attached files	24
Making voice calls (for example, Skype)	18
Operating on certain portals	17

Self-evaluation: knowledge of data protection

Limited, I am not aware/informed of the principles of protection and the necessary actions	3
Good, I am informed about the key principles	8
Very good, I have an in-depth knowledge	1
Average, I am informed about some necessary actions	13

Experience working with the HIS:

I've used only one health information system	3
I've used several health information systems	5
I have used health information systems, I do it every day	14
I have used health information systems, I do it rarely	2
No, I have not used health information systems	1

Training process organization

The training process started with the first face-to-face meeting, where the participants met the instructors and were told about the project in-short. Participants were explained the aim of the project, structure of the course and the degree of support they could receive during the run of the course. After this introduction the course was shortly presented, the e-learning platform Moodle was shown with a course material and test demonstration. Participants were also told about the ECDL exam – the practical aspects of the exam itself, like the number and nature of the questions, time limit as well as the ECDL certificates they would receive if passing the exam successfully.

During the final training session participants took an evaluation questionnaire on their thoughts on the course and sat the ECDL exam. Just like in the very first meeting, participants were divided into 2 smaller groups, so they could comfortably take the ECDL test.





Participants' opinion on the content

The part of the project material that the participants appreciated most, as indicated in the opinion questionnaires and expressed in the in-class verbal feedback was the Workplace Security module. It was commended on its universal applicability and usefulness in the everyday operation of all the employees, regardless the job specificity. The Health Information system module, however, was criticized for its specificity. Because the information systems employees are required to use differ greatly, even if working in the same field or organization, for some the material had too much or too little detail, for some it was irrelevant and didn't correlate to their needs altogether.

Participants suggested supplementing the curriculum with the following:

- More information on privacy and confidentiality;
- More information on data protection;
- To supplement the information on the patient experience in the National Health IS (E-veselība);
- More on IS maintained internally by specific organizations;
- An in-depth analysis/discussion on specific situations;
- More discussing of practical data-protection aspects at workplace;

Results of ECDL certification

The participants took the test on two different dates. The first group had 12 participants in it, 8 of whom passing it successfully and 4 – failing. There were 11 participants in the second group, all of whom passed the ECDL test and received a certificate. In total the test was taken by 23 participants, and the ECDL certificate was obtained by 19 participants.

How can the program complement the health care education system of the country?

The program could contribute to the elimination of the digital knowledge gap in the higher and professional education. As there are ever growing demands for healthcare professionals to be proficient in information technology and insure safe data handling, however appropriate training is lacking. The security module could serve anyone working or studying in the field and be a valuable addition due to its easy-to-manage form of online studies.

If considering the program for use in a professional environment, the variety of the participants' specialty and everyday practice should be much more closely examined. Due to the variety of needs of professionals, even ones working in the same field, the Health Information Systems module of the program and its applicability poses a challenge.

4.2. Lithuania

Participants' information and selection process

Information about the pilot training and invitation to participate was disseminated in various ways:

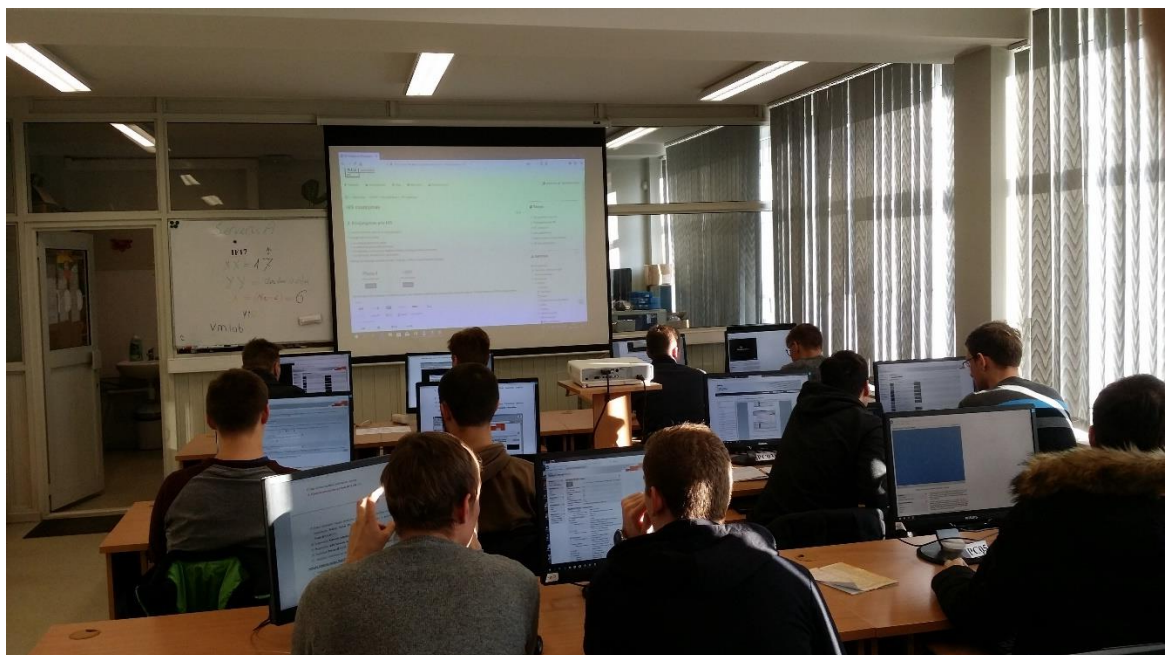
An invitation was published on the <http://www.ecdl.lt> website, as well as shared for university teachers to post to the target group (health informatics, information systems study programs).

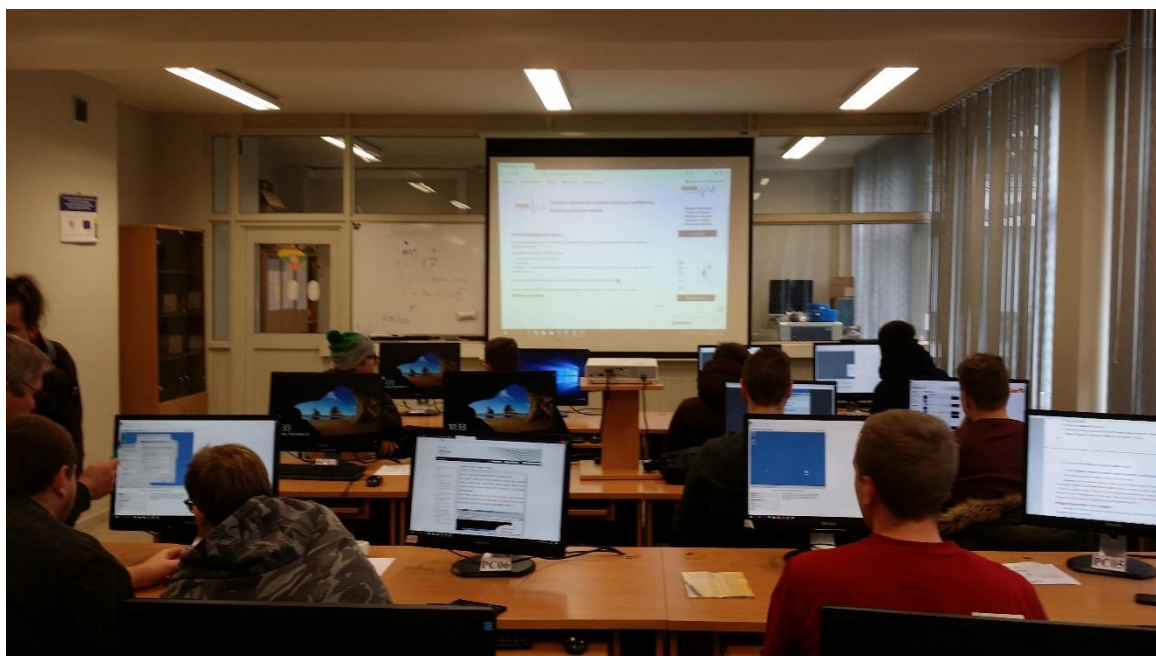
A printable version (leaflet) of the invitation was used to disseminate information about pilot training. This leaflet was distributed at the lectures for students.

Information about registration to pilot course was published on the <http://www.ecdl.lt/kvieciame-i-pilotinius-kursus> website.

Participants' profile

In Lithuania 20 students, age 20-23, were involved in training, the majority of participants were males.





Students' motivation to join training

Students were interested in participating in the pilot training because the topic about safe health information systems usage is very important and useful.

The pilot training process was organized mostly by having face-to-face meetings as well as online training using Moodle. In the first face-to-face meeting students were introduced about HIS4HE projects by using discussions were identified expectations from the trainings. During the pilot trainings teacher used presentations, PDF files and Moodle environment in order to show theoretical part, various videos were demonstrated according to the particular topic. Students has possibility to check their knowledge by using self-evaluation test and certification test.

The final face-to-face meeting was dedicated to course evaluation. Students expressed their opinion about the training course, fulfilment of expectations etc.

Participants' opinion on the content

The participants stated that the themes about confidentiality by using health information systems and workplace security. For students no difficulties to understand all course topics were identified. Students stated that they got new useful knowledge not only related with workplace, but for personal life as well.

After the course students took certification test. After the course students took certification test. The results were very good, all participants successfully passed the test.

5. Conclusions and recommendations

5.1. Summary on training organization. The main conclusions

Health care professionals usually lack the knowledges and practical skills needed for use of health information systems. Most of users already working with HIS and potential users of HIS do not have thorough understanding about patient data protection, privacy and legal issues. HIS users lack trainings on how to use such information systems in their daily work effectively. This issues cause:

- high level of dissatisfaction among medical staff;
- incorrect electronical identification, patient data security and privacy;
- inefficient use of HIS functionalities.

Following the advices of experts, only the most appropriate modules were included in the trainings program:

- various functions of HIS;
- electronical identification, protection and privacy;
- access to data using different types of logins;
- national legal requirements for the use of HIS.

Participants highly appreciated the workplace safety module and acknowledged it's overall benefits for daily work for all medical staff, despite of work specifics. Health Information System Module has been recognized as useful for everyday work, despite of profession specifics, of each course participant.

5.2. Recommendations on further use of the developed material and organisation of teacher training process

Trainings program and ECDL certification test "Health Information Systems" developed during project are suitable for vocational education institutions in Latvia and Lithuania. Online course covers all ECDL Health Information System training modules. At the end of trainings, participants have the opportunity to receive ECDL certificate.

Trainings program is aimed for various audience: doctors, administrators, pharmacists, social workers, healthcare managers nat other health professionals.

Therefore, considering the use of these educational tools in the professional environment, the specialty and daily practice of course participants should be carefully examined. Taking into account needs of different specialists, "Health Information Systems" curriculum can be adapted to the specific needs of participants.

6. Project partner profiles

Kaunas University of Technology



Kaunas University of Technology is a public institution of higher education operating in accordance with the Republic of Lithuania Law on Higher Education and Research. It is the oldest technological university in Lithuania, established in 1922, and is one of the leading institutions of higher education in the region by the number of students, research and innovation activities, and the positive effect on the society of the region. It is ranked among the top 4 percent of world universities according to QS World University Rankings, ranked 1st among Lithuanian technical universities and is 2nd among higher education institutions across the country according to national rankings.

The University pursues its activities in accordance with the strategic documents governing Lithuanian higher education, regulations of European Higher Education Area and the European Research Area, and the best practice of Lithuanian and foreign universities.

KTU was awarded the Diploma Supplement Label by European Commission, ensuring KTU Diploma is recognised in Europe and beyond.

KTU cooperates with the prestigious Stanford (USA), Aalto (Finland), Lund (Sweden) and other world-class universities. Teachers, researchers and staff consult the UNDP, the UN and other international organizations, professors are involved in the doctoral dissertation defence committees of the EU and CIS countries. Students have a possibility to study and to do research in almost 400 universities and other types of organisations around the world under ERASMUS, interuniversity, cross-national and other exchange programmes. International placements are available under ERASMUS, BEST, IASTE, VULCANUS IN JAPAN, Partners for Value placement and exchange programmes.

Latvian Information and communications technology association – LIKTA



Latvian Information and communications technology association (LIKTA) was founded in 1998 and it unites leading industry companies and organizations, as well as ICT professionals - more than 160 members in total.

The goal of LIKTA is to foster growth of ICT sector in Latvia by promoting the development of information society and ICT education thus increasing the competitiveness of Latvia on a global scale. The association provides professional opinion to government institutions on legislation and other issues related to the industry, while also maintaining close relationships with other Latvian NGOs and international ICT associations.

Web page: www.likta.lv





Joint stock company “Datorzinibu Centrs” (DZC) is one of the leading IT training, e-learning and software development companies in Latvia, operating in this field since 1996. DZC has 42 employees among which 8 are trainees. The company’s top priority is complete understanding of the needs of the clients for the maximum benefit of their investment into the information technologies. Therefore the work is targeted to implementation of modern and perspective information system solutions. The main types of services are:

- Computer training for Microsoft Office, Microsoft Dynamics AX, NAV and CRM, as well as for custom- developed information systems designed exclusively for the needs of a customer.
- Development and implementation of learning management (LMS) and learning content management systems (LCMS).
- E-learning content development.
- Certification services (Prometric, EXIN un Pearson VUE authorized test centre).
- IT consulting.
- IT audit and security.
- Design, development, implementation and maintenance of information systems (databases, data warehouses and analysis, web application software).
- Design, delivery and maintenance of IT infrastructure solutions.

In training DZC provides a perfect combination of the best teaching methods, professional experience and well-prepared hand-outs. The theoretical material is accompanied by diverse examples, practical tasks and self-assessment options. DZC holds the status of Education institution.

DZC Training Centre offers to:

- acquire the skills and competences required for work with IT software;
- attend Microsoft server and technology courses for IT professionals and programmers;
- obtain Microsoft Dynamics applications training;
- develop and adjust the training curriculums and programs to the needs of employees of a specific company;
- provide individual trainings and consultations.

DZC is a partner in the Project „Information Technology Training for Small and Micro Businesses to Promote Competitiveness and Productivity Training projects” – Latvian companies are welcomed to participate in a training project for small and micro enterprises which allows improving IT skills of their employees. Enterprises have the opportunity to learn 10 various courses about the usage of IT necessary for enterprises’ everyday tasks. During this project DZC has created training curriculums, content of the training, learning materials, e-learning courses and tests. Since



year 2013 approximately 600 enterprises have participated in the project and more than 2000 employees of various sectors have been trained in ICT skills linked with corresponding softskills and entrepreneurship skills. The quality of „Datorzinibu Centrs“ services is confirmed by ISO 9001:2008 quality certification. The company is also the Microsoft Gold Certified Partner since 2000.

Public institution Information Technologies Institute (ITI)



Public institution Information Technologies Institute (ITI) was established in 1997 and started as an organization which creates temporary professional working groups for projects on Information System design. The full-time staff of ITI includes administrative, financial and project managers (5-10 persons). ITI has strong experience in IT training/testing courseware design and development.

From year 2000 ITI started with ECDL (European Computer Driving License) Programme implementation in Lithuania. Now ITI is the official ECDL Foundation Sub-licensee for Lithuania. Currently the development and dissemination of computer literacy related training/testing systems have the major importance for the Institute. ITI has developed the Automated ECDL Test System which is authorised by the ECDL Foundation. The In-Application testing based version of the Test System has entered the official authorization process at the ECDL Foundation level also. In 2009 ITI has launched the ECDL Foundation Endorsed Partner Programme e-Guardian. Currently ITI is involved in development of Learning/Testing solutions for ECDL, e-Citizen, CAD, security and children safety subjects in Lithuanian, Latvian, Estonian, Azeri and English languages.

From November 2013 ITI (ECDL Lithuania) is involved as a stakeholder in the National Digital Coalition for the Promotion of Digital Skills for Jobs in Lithuania (www.skaitmeninekoalicija.lt/en/).

Web page: www.ecdl.lt

DLGI



DLGI is founded in 1992 as a spin-off of the German Computer Society (Deutsche Gesellschaft für Informatik - GI). It is an accreditation agency for IT-certification, which has successfully introduced an European IT certification standard by implementing ECDL, the European Computer Driving Licence, in Germany. The ECDL programme is internationally recognised as benchmark for end-user computer skills and is the leading certification to be adopted by governments, international organisations and corporations alike.

