

DIRA Learning Platform as a Learning Management System (LMS) for Roma Adults Gaining Knowledge and Skills in E-Services

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Abstract:

Romas' ability to use e-Services is very important. With skills in using digital equipment and e-Services platforms, the Roma are better included in the society. Social inclusion will help Roma adults at risk of social exclusion gain opportunities and resources necessary for full participation in socio-economic and cultural life, and for achieving a decent socially acceptable standard of living and well-being. DIRA project's aim is to achieve inclusive societies in which Roma adults enjoy equal rights and access to services and knowledge. This paper presents the developed DIRA learning platform with an appropriate content for education of adults in usage of the e-Services. Translated in six languages (Finnish, Swedish, Italian, Macedonian, Serbian and English), the outputs will be ready to reach a wider audience impact through the partners' membership in European and international networks. The DIRA learning platform may be used not only by the Roma, but also by other vulnerable groups at an international level (e.g. ethnic or socially excluded minorities and refugees). As the learning platform and materials will be open access and placed in the project's website and EPAL, anyone can freely use the platform in a resource-wise and sustainable manner.

Keywords:

DIRA platform, e-Services, Roma adults

1. Introduction

The Roma are Europe's largest ethnic minority. According to the European Commission out of an estimated 10 to 12 million Roma living in Europe, approximately 6 million are citizens or residents of the EU. Many EU Roma are still victims of prejudice and social exclusion, despite the discrimination ban across EU Member States [1]. The education of the Roma as a marginalized group characterizes with low level of knowledge quality and quantity. The general dimensions of the social exclusion like poverty, unemployment, endangered health, illiteracy etc. which are more present at the Roma population, can be noted the most in their level of education. The educational system is relatively and strictly linear, which means the lack of primary and secondary education among the adult Roma is in correlation with the low level of education in the adult years. This education reality unravels the opportunity to identify possibilities for adult education, which models the project idea to create space for completing Roma adults' education with modern ways of life, especially the digital skills.

The modern information and communication technologies impose the need to modernize the formal and non-formal education of Roma, thus opening up space for implementing information concepts, which enable the completion of their education and gaining skills that make their inclusion in the society more effective. From the aspect of non-formal education, studies show there is no offer for gaining knowledge about the mentioned technologies for the Roma population, opening space for introducing

non-formal educational programs based on the acquisition of digital skills and competences. This type of education represents an important tool for investment in intellectual capital and inclusion of the Roma in the socio-economic structures of society.

The needs assessment study carried out in 2022, done in the project partner countries by the consortium, showed that Roma adults are hardly using available IT tools for e-Services provided by public and private institutions [2]. These services include checking out medical appointments, filling online forms (e.g., tax forms and social services forms), using electronic banking systems, performing online payments, filling service requests, online shopping etc. The vast of adult population and the socially excluded persons are not acquainted with new technologies that nowadays are used for most of the service delivery. Those who are not in everyday contact with technologies consider the fast-growing development of the IT sector, especially in the usage of applications and online forms, difficult to follow. Thus, every update in e-Services needs new skills creating gaps for their successful usage by socially excluded people. Problems and gaps deepen with time and this situation can be decisive for people's inclusion in the system. Although in the partner countries there is generally a developed e-culture among most of the population, there are groups of socially excluded persons, which are not part of this development. There is difference among the countries and a need for sharing the experience and common approach to the problem. Some of the countries have high e-Service culture among people due to the quality of the e-Services and standards of living. But the countries with lower living standards have lower culture, which affects poor and socially excluded persons the most.

The need for abilities and skills related to e-Services usage is increasing as most of the public services are online, or if they are not, governmental institutions invest to make them online. This negatively affects service users who do not have access to IT tools, internet and mobile phone services. Another group of service users affected are adults and socially excluded groups. Also, the covid-19 pandemic made the usage of e-Services a requirement to prevent long lines in front of public service offices, banks and shops for social distancing. However, due to the lack of IT skills and use of e-Services, in many countries we see long lines of Roma adults waiting to withdraw their salaries and pensions or buy groceries and other necessary products, which increases the possibility of covid-19 infection and makes them more vulnerable than those effectively using e-Services. There is an evident need for bringing e-Services closer to Roma adults and other vulnerable groups.

This paper represents the design/features of the developed DIRA web learning platform and modules from which the platform is built for the purpose of the project. It is intended for learning and training Roma adults to increase their use of e-Services and improve their digital and language skills.

The paper is organized as follows. Next section states the objective, previous work is described in Section 3, whereas Section 4 discusses the technologies used for the development of the DIRA platform. Description as well as screens of the developed web platform are given in Section 5. Last section gives a brief review of the research, providing concluding remarks and directions for further work.

2. Objective

The main objective of the creation of the learning platform is the improvement of the socio-economic state of Roma adults through IT education and development of digital skills and competences to enable the adult population and socially excluded people to start using electronic services available in their surroundings, and to become better included, better informed and empowered in their communities and societies.

3. Previous work

There is an evident need for bringing e-Services closer to Roma adults and other vulnerable groups. This will result with benefit from upskilling their knowledge and skills on using e-Services to being better included in their communities and societies.

The digital educational method, contents and partial results of the ongoing project Head in the Clouds: Digital Learning to Overcome School Failure - an EU-Erasmus+ strategic partnership aims at providing quality educational materials for students from Roma communities in order to help participants develop the digital and transversal skills required to overcome existing boundaries to access

(higher) education, employment as well as economic stability [3]. The findings presented in the article by the authors of [4] illustrate that the use of ICTs can contribute to empowering Roma/Gitano adolescents to improve the position they occupy as a group in the social structure. The paper [5] discusses how potential long-term impacts of ICT enabled self-organized learning environments, creating more inclusive educational programs and societies, and the potential contribution of inclusive and IT supported learning environments towards the achievement of the United Nations Sustainable Development Goals (SDGs). Based on the outcomes of the study that included surveys among Roma assistants and teachers, the article [6] analyses the technical conditions available to Roma pupils for remote learning during lockdown and provides a comparative perspective of the position of Roma and other pupils and draws attention to the possible long-term consequences of remote learning for Roma pupils. The authors of [7] introduce the CloudLearning project that represents an alternative and innovative educational method: the way of the SOLE method implemented in their education. The results of the general survey presented in [2] and the conclusions of the national reports show that the usage of digital devices and the access to digital opportunities are severely limited for Roma people regardless of the country - of residence and of origin. This result reinforces the approach of the DIRA project to devise common actions and initiatives to introduce and foster access to digitalization among Roma. Exploring barriers, for example languages and cultural sensitivity, influencing the effectiveness of the learning platform, a strategic model for the effective implementation of the platform was proposed via trainer's training. The trainings provided educators and participants with reinforced digital skills needed at different levels in the community. Paper [8] explores how digital financial services have the potential to support the economic inclusion of poor Roma families if such services are implemented in ways that comprehensively take all five dimensions of access into account. The focus of [9] is the issue of discrimination against Roma communities in the use of educational online platforms on account of failure to provide digital consent. It aimed to foster the discussion of discrimination against marginalized Roma communities in accessing education through online platforms and to point out the inadequacy of national legislation on the provision of digital consent.

4. Used technologies

The developed DIRA web platform aims to help Roma adults to learn smoothly how to use the IT tools. The platform is designed in a simple way, adapted to their low level of knowledge of IT technologies, so that they can remember and practice using e-Services from different institutions and in different conditions and situations. The development and design of such a learning system for Roma adults will contribute to the development of digital skills and competencies, which is in direct correlation with the overall goal of the project.

Towards fulfilling this goal, several different technologies were used for the development of the platform. The backend was build using Flask and a MySQL Server as a relational database management system (RDBMS). Flask is a web application framework written in Python, which was chosen due to its independence upon external libraries, its flexibility and simplicity. Being free and open source while offering data security, high efficiency and scalability on demand, MySQL is one of the most popular and most used RDBMSs worldwide. Phusion Passenger was used as an application server, whereas nginx was used as a web server. Phusion Passenger is an open source and extremely memory efficient web application server which is also designed to integrate into the nginx web server. The nginx web server offers various advantages such as scalability, handling of concurrent requests, load balancing, performance speed up and an overall good browsing experience for the users.

The frontend of the platform was developed using React.js. There are many compelling benefits of using React.js, such as component-based architecture, stable code structure, simplified scripting, as well as easy to learn and use.

5. Description of the developed DIRA platform

The DIRA Project Learning Platform is an innovative online learning platform that aims to provide a comprehensive and customizable solution for creating and delivering courses. It offers a range of features that enable administrators to create courses with individual lectures, each containing diverse content types such as text, video, images, and documents. With its user-friendly interface and customizable language options, the platform aims to make the learning experience accessible and tailored to the needs of users worldwide in a sustainable manner. Consequently, identifying the knowledge gaps, the platform offers additional insights to learning barriers such as languages and cultural sensitivity to improve performance of the platform at an international level.

Administrator users can only be registered by other administrators. They have access to the following features:

1. User Management module - create, edit and delete users of all types,
2. Language Management module - create, edit and archive languages,
3. Category Management module - create and edit category list.

Users Management module, Figure 1, has a search bar (search for a user...) to search for a specific user by their full name. Right under that, there is a green plus button next to which there is the text "CREATE NEW USER" for redirecting to a form for creating new users. Also, there is a table with all the users in the system.

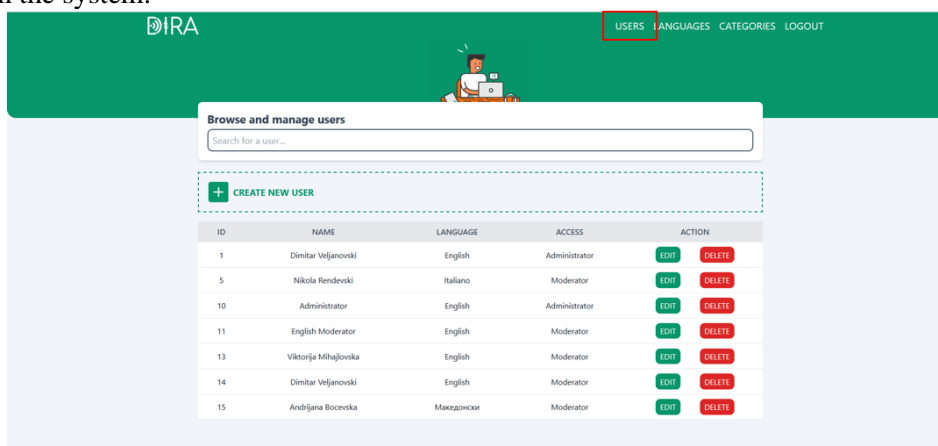


Figure 1: User Management - Navigate to screen

The Language Management module, as illustrated in Figure 2, provides the ability to create, edit and archive different languages. The main difference between Archiving and Deleting is that if you archive a language, you can retrieve it. This is done with the goal not to lose any data for that language.

Similar to the previous two modules, the Category Management module, Figure 3, provides capabilities of creating, browsing and updating categories in the system. By clicking on the name of one of the categories, you will be redirected to a page where you can edit the name and description of that specific category.

Moderator users can only be registered by administrators. They have access to the following features:

1. Course Management module - create, edit courses,
2. Translation Management module,
3. Profile page - Edit user profile.

Courses Management page, Figure 4, has a search bar to search for a specific course by its name. Also there is a green plus button next to which there is the text "CREATE COURSE" for creating new courses. At the very bottom of the screen each created course can be found. By clicking on the name of one of the courses, users will be redirected to a page for editing the details and lectures of the specific course, Figure 5.

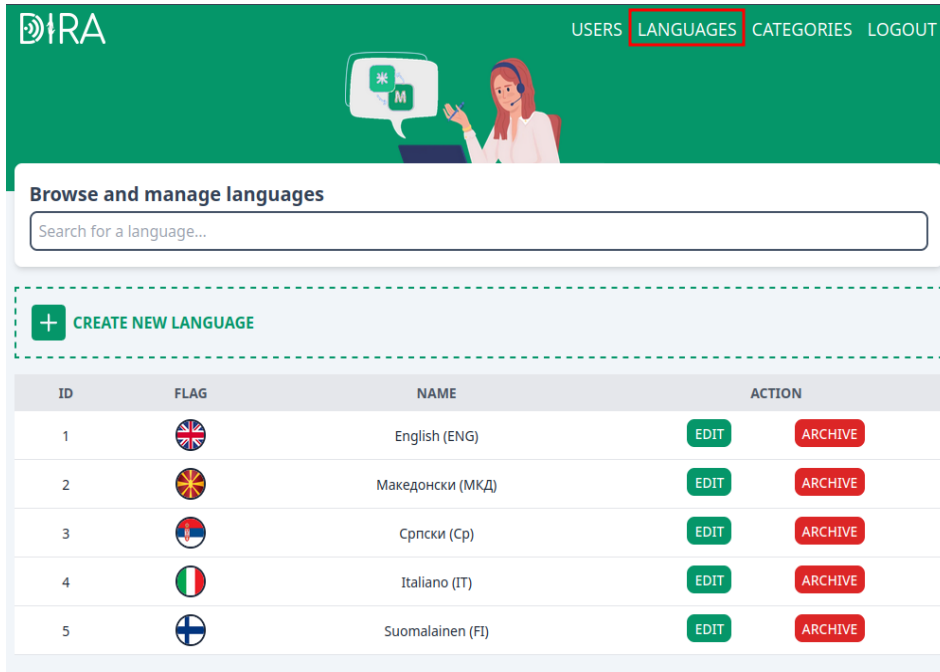


Figure 2: Language Management - Navigate to screen

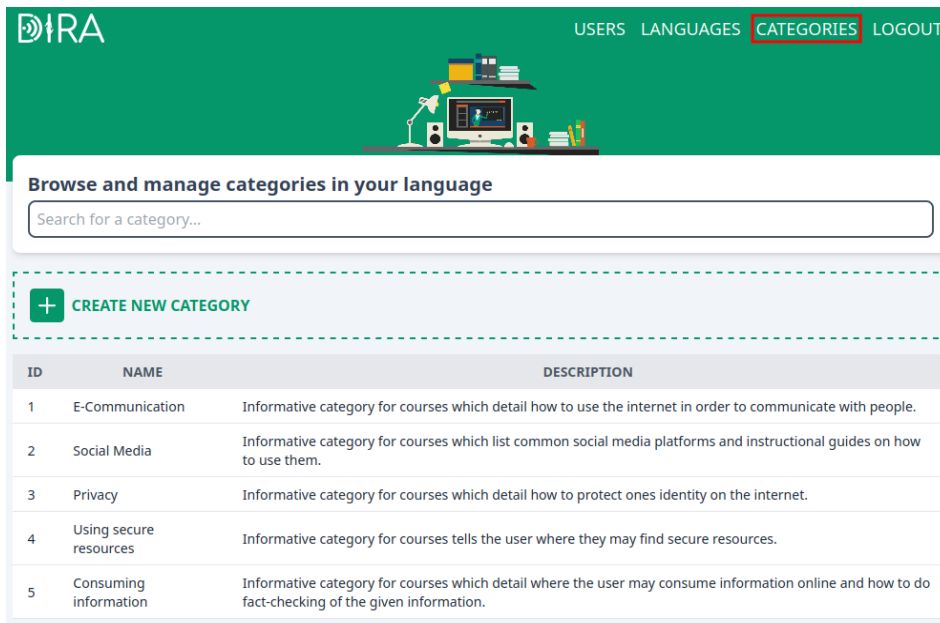


Figure 3: Categories Management - Navigate to screen

The course name, description, categories list and cover photo can be edited. For adding a new lecture, the plus button can be used. Next to each lecture, there are arrows which are used to change the order of the lectures in the course. By clicking on the up-arrow, the lecture will be moved one place up in the list of lectures. Conversely, by clicking on the down arrow, the lecture will be moved one place down in the list of lectures. On the far right, there is an edit button for redirecting to the Edit Lecture page. On that page, the specific lecture itself and its content can be updated. There are two modes of view on this screen. On the top-right of the Browse Lecture Content section, there is a button to toggle between the two modes of view. The view mode is used to see roughly how the content will appear for viewing by the user. The edit mode is used to edit the order and data of existing contents in the lecture or delete the content.

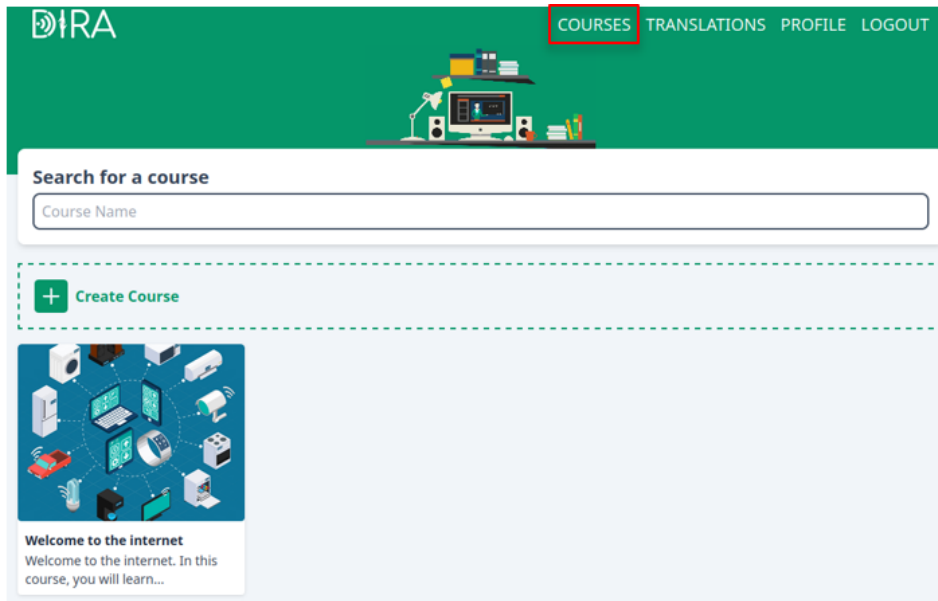


Figure 4: Courses Management - Navigate to screen

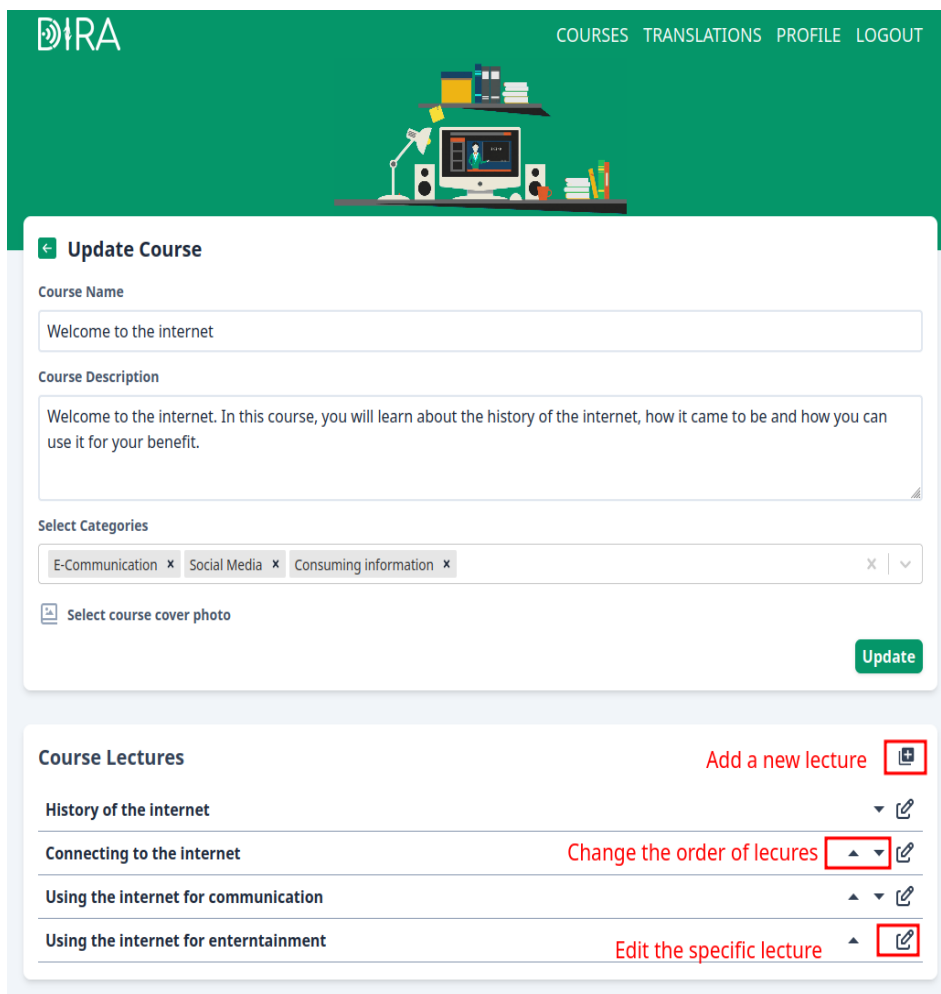


Figure 5: Course Management - Edit course and manage lectures

The Translations Module is used to translate the UI in the language you are assigned to moderate. The translation page consists of a form with multiple inputs, of which each has a label that describes the phrase you need to translate from English to your language.

Profile Page is a screen which enables the user to change their individual profile information - name, surname, email and update their password.

Regular users do not require an account to log-in. When they open the DIRA Learning Platform, they will be greeted with the Courses page. By default, this page displays the courses for the English language. The user can select a language by clicking on the language select button in the navigation bar, as shown in Figure 6.

On the same screen, the user can filter the courses by name or category. By clicking on a course, the user will be redirected to the content page for that specific course, Figure 7. On this page, the user can browse through the different sections in the course and read through the content. By hovering over an image, or pressing on it when using a mobile device, a button will appear. Upon clicking it, the image will expand to fit almost the entire width of the screen.

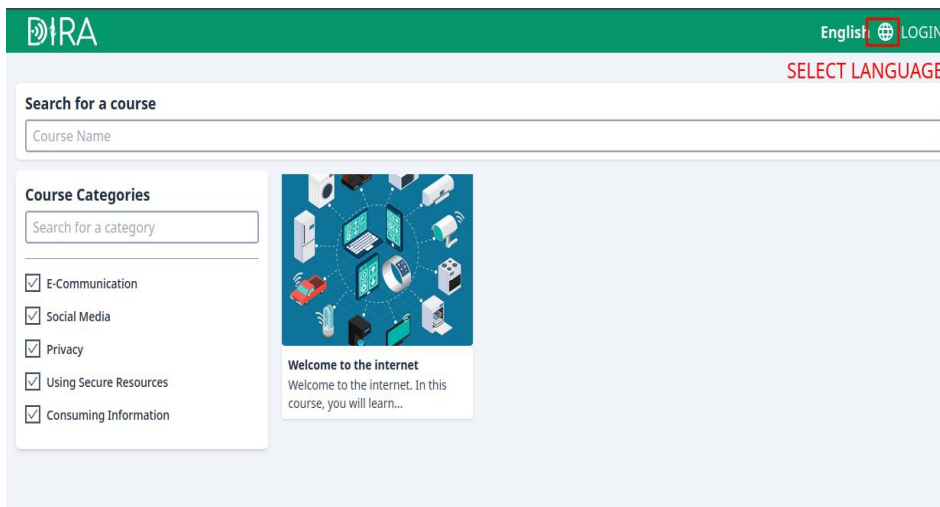


Figure 6: Language button

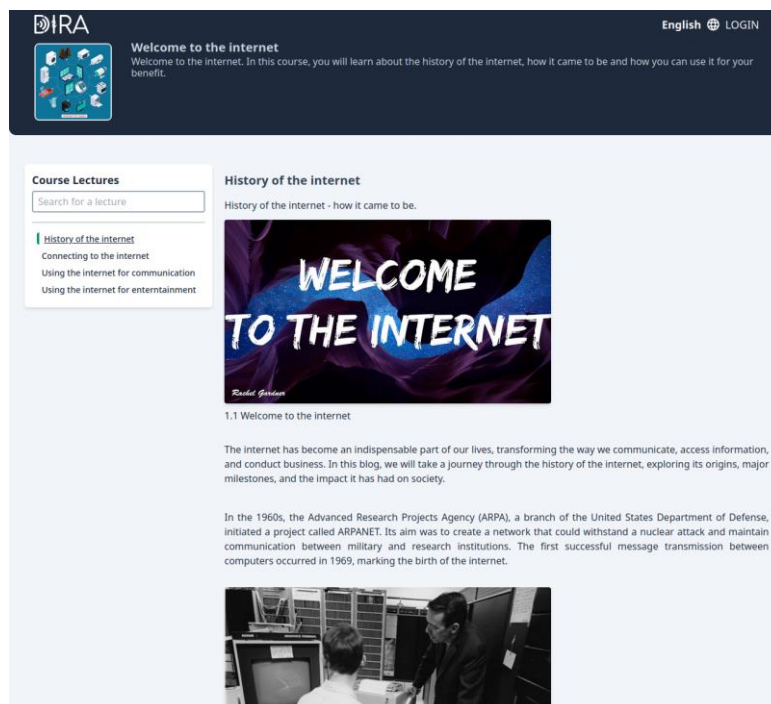


Figure 7: Course Content Page

6. Conclusions

The DIRA project for development of digital skills among the Roma population is an incremental innovation that is computer-generated, based on the principle of learning by doing. The development of digital skills through the creation of IT tools and online platforms is a technological innovation that enables modernization of the knowledge acquisition process. The paper provides basis for improvements to the organizations and institutions where the systematic problem of e-exclusion exists and it will enable them to use the project's outputs and capacities to improve their e-inclusion functioning. The developed DIRA web learning platform for learning and training for the project purpose is intended for upskilling the knowledge and skills of Roma adults on using e-Services in order to become better included in their communities and societies. With its user-friendly interface and customizable language options, the platform aims to make the learning experience accessible and tailored to the needs of users worldwide. The modules and materials from which the web platform is built are tailored through the baseline study and evaluation survey done in the project partner countries. The platform is translated in six languages (Finnish, Swedish, Italian, Macedonian, Serbian and English) with the intention of "achieving inclusive societies in which Roma adults enjoy equal rights and access to services and knowledge". As the learning platform and materials will be open access and placed in the project's website and EPAL, anyone can use them. As a direction for further work, the developed DIRA platform can be extended with new categories, as well as courses and content for these categories. Some aspects of the platform such as for example efficiency, user experience and impact will be evaluated using suitable methods. Moreover, sustainability measures of the platform will be ensured.

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References:

- [1] Roma equality, inclusion and participation in the EU, European Commission, 2020, https://commission.europa.eu/strategy-and-policy/policies/justice-and-fundamental-rights/combating-discrimination/roma-eu/roma-equality-inclusion-and-participation-eu_en
- [2] DIRA Project Report "Digital skills in the Roma community", Results of the survey implemented by DIRA Project in Finland, Italy, Serbia and North Macedonia, https://evermade-hdl.s3.eu-central-1.amazonaws.com/wp-content/uploads/2023/03/28151019/DIRA_SurveyReport_final.pdf
- [3] N. M. Novak, M. Rabiee, A. M. Tjoa, Head in the Clouds: An Initiative for Digital Learning among Roma Communities in Europe, In Proceedings of the 10th International Conference on Computer Supported Education (CSEDU 2018), pages 384-390, ISBN: 978-989-758-291-2, <https://www.scitepress.org/papers/2018/68068/pdf/index.html>
- [4] M. Garmendia, I. Karrera, ICT Use and Digital Inclusion among Roma/Gitano Adolescents, Media and Communication (ISSN: 2183-2439) 2019, Volume 7, Issue 1, Pages 22-31, <https://core.ac.uk/download/pdf/229941059.pdf>
- [5] N. M. Novak, M. Rabiee and A. M. Tjoa, "ICTs for Education: An Inclusive Approach to Addressing Challenges Faced by Roma Communities in Europe," 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), Opatija, Croatia, 2019, pp. 1355-1361, <https://ieeexplore.ieee.org/document/8757108>

- [6] R. Bešter, J. Pirc, Impact of Remote Learning during the Covid-19 Lockdown on Roma Pupils in Slovenia, *Treatises And Documents Journal Of Ethnic Studies Razprave In Gradivo Revija Za Narodnostna Vprašanja* 85/2020, p.139–164, <https://rig-td.si/wp-content/uploads/2020/12/Rig-85-Bester-Pirc.pdf>
- [7] D. Pal'ová, N. M. Novak and V. Weidinger, "Digital learning as a tool to overcome school failure in minority groups," 2017 40th International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), Opatija, Croatia, 2017, pp. 767-772, <https://ieeexplore.ieee.org/document/7973525?reload=true>
- [8] C. I. Ravnbøl, "Accessing Cash(lessness): Cash Dependency, Debt, and Digital Finance in a Marginalized Roma Neighborhood." *Economic Anthropology*10(1), 2023, 44–54, <https://anthrosource.onlinelibrary.wiley.com/doi/10.1002/sea2.12265>
- [9] D. Nevická, D., M. Mesarčík, Why are you offline? The issue of digital consent and discrimination of Roma communities during pandemic in Slovakia. *International Journal of Discrimination and the Law*, 22(2), 2022, 172–191. <https://journals.sagepub.com/doi/10.1177/13582291221096615>