Innovative online technologies as a tool of qualified specialists training in the field of waste management

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Abstract. The article discusses new technologies that are used in creating content for online training modules, as well as specific examples of using certain tools in the formation of courses for online modules in the field of waste management in the framework of the EduEnvi project. The article describes online tools that can be used for visualizing, structuring and systematizing of various types of information, such as describing the course structure, showing a list of topics, possible tasks, etc. The need for visualization and systematization of information becomes very important when it comes to online training, which requires developers to be an extremely clear and detailed presenting their educational material, teaches them to be more open and communicative. The article also contains information about the formats of work in the project which helps partners from five different countries to exchange experience, learn something new and develop online courses. These online courses will be the main result of the EduEnvi project.

1. Introduction

The transition of the Republic of Kazakhstan to sustainable development is an urgent need because the country needs development that meets the requirements of the present generation and does not constrain the ability of future generations to meet their needs. Economic growth due to the exploitation of natural resources can occur only at a certain stage. In modern conditions, more progressive mechanisms are required for growth and development.

In all Kazakhstani settlements, especially in large cities, the problem of collection, storage and processing of increasing volumes of municipal waste is acute. The main method of waste management today is the placement of waste in landfills. At the same time, the operation of most landfills and municipal waste dumps in Kazakhstan does not meet regulatory requirements. About 90 % of the existing landfills in the country do not meet the requirements of environmental and sanitary legislation [1]. Only a part of settlements of the Republic is covered by services of the specialized enterprises on collecting and export of waste, and the others are left without service.

2. Materials and methods

One of the main factors influencing the solution to the problem of effective waste management in the
Republic is the training of qualified specialists. Modern trends in education are closely related to the online environment, for example, the use of information technologies in the educational process, the introduction of distance learning, etc. At the moment, universities are reviewing existing teaching methods, are in search of the benefits of contact with students to further redistribute resources in favour of more effective teaching methods in combination with the use of online courses in the educational program [2]. Innovative technologies are important in the process of online learning, due to the rapid obsolescence of existing professional knowledge and the need for continuous improvement. One of the most optimal forms of modern education, equally effective in obtaining basic and additional education, is distance learning or online learning, called by some researchers the educational system of the 21st century [3]. Thus, in terms of improving the competencies of future specialists in the field of waste management in 2018 the international project EduEnvi has been launched, the main idea of which is to train competitive specialists in the field of waste management through the development of online educational modules, placing them on national online platforms, as well as introducing them into educational programs at the master's level [4].

3. The study of the innovative technologies usage opportunities in the online educational process

The EduEnvi project announces specialists from five countries and aims to increase competence in the field of sustainable waste management in the training of specialists in universities of Russia and Kazakhstan and internationalization of education. The project coordinator is Finland (Tampere University of Applied Sciences), methodological assistance is provided by specialists from Denmark and Spain.

In addition to the "live" meetings, during which the specialists of 6 universities of Russia and Kazakhstan get acquainted with the latest European pedagogical technologies, as well as improve their skills in the formation of curricula, selection of teaching tools and evaluation criteria, the work within the project is carried out using online technologies, for example, programs that allow virtual meetings, so-called webinars. By the way, a large-scale webinar was organized with the participation of three Kazakh universities: Kokshetau State University named after sh. Ualikhanov, Kazakh National University named after al-Farabi, South Kazakhstan State University named after M. Auezov. The participants of the meeting – teachers, students and undergraduates, representatives of the industry, as well as stakeholders – discussed topical issues related to waste management, exchanged views and came to generalized conclusions.

As mentioned earlier, the work in the project is based on the development of eight modules that cover a wide range of competencies necessary for successful waste management, from introduction to environmental risks and their assessment to business process modelling and environmental management in General. Currently, content developers are engaged in applying the knowledge and skills to form a thematic plan of disciplines within each of the modules, as well as the selection and development of suitable tasks and types of training activities that would be most effective in the online environment, tools and evaluation criteria [5].

The courses will draw on the latest research, best practices and the latest technologies in sustainable waste management [6]. Increasing the competence of the teaching staff in the field of sustainable waste management will modernize existing curricula and create new educational programs in the field of sustainable waste management. The online platform will be international, multilingual, and can be used as continuous training for individuals employed in the sustainable waste management industry. The project involves closer cooperation between universities and industrial enterprises and integration between universities.

Focusing on the tools that can be used in the implementation of online learning, it is necessary to note their great variety, different functionality and breadth of application: writing texts and blogging, searching for the necessary content, editing and creating images, tools for questionnaires and newsletters, creating lists with the help of task managers and planners, the use of interactive maps, etc [7,8].

So, as part of the work on the content of future modules, to familiarize students with the discipline,
its structure, competencies, a special resource was selected that allows you to organize all the necessary information for the student – the platform canva.com, which can also be used for summarizing information by students, presenting the results of activities in the framework of group work, project activities, etc. (Figure 1).

For a structured visualization of the process or a certain route that the student will have to go for the development of a particular course, as well as for the creation of mental maps, fixing the results of brainstorming, the most appropriate service is coggle.it (Figure 2).
4. Conclusion
As a result, participation in the work of such projects has many positive aspects, such as improving the skills of the teaching staff, exchange of experience, a new look at existing methods of creating educational content, dissemination of knowledge, as well as improving the quality of teaching using interactive teaching methods in the work. The experience gained will be useful in the further implementation of distance learning and the development of increasingly popular open online courses. The undoubted advantage of the project is also the intensification of joint activities of higher education institutions and industrial enterprises to find the best algorithms for rational use of resources, the search for opportunities for the use of secondary raw materials in production and reduce the formation of new waste.

The training of highly qualified specialists in sustainable waste management will give impetus to the development of research in cooperation with local enterprises and the creation of innovative technologies to reuse valuable components from waste and thus reduce the use of natural resources and reduce the waste generation in production.

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References
[1] Ministry of National Economy of the Republic of Kazakhstan. Statistics committee, available at: http://stat.gov.kz/
[2] Vyushkina E G 2015 Saratov University News. Series: Philosophy. Psychology. Pedagogy 15 (2) 78-83
[3] Chekalina T, Tumandeeva T and Maksimenko N 2018 Contemporary tendencies in professional education development 3 (31) 44-52
[4] Zakharova U and Tanasenko K 2019 Education Studies 3 176-202
[5] Kakabayev A A, Kurmanbayeva A S and Fakhrudenova I B 2018 Proc. Int. Conf. “Internationalization of higher education: experience in implementing joint European projects” (Kokshetau) p 24-29
[6] Morrisseya A J and Browneb J 2004 Waste Management 24 297-308
[7] Martinez-Cerda J F, Torrent-Sellens J and Gonzalez-Gonzalez I 2018 Behaviour & information technology. SI. 10-11 1055-1071
[8] Akcaoglu M and Kale U 2016 Contemporary Issues in Technology and Teacher Education 1 60-81