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Ensuring sustainable development through the use of digital educational hubs for teaching civic education at school

O O Hrytsenchuk¹, M P Leshchenko^{1,2}, O V Ovcharuk¹,
S I Trubachev³ and S V Trykoz⁴

¹ Institute for Digitalisation of Education of the NAES of Ukraine, 9 Berlynskoho Str., Kyiv, 04060, Ukraine

² Institute of Pedagogics, Jan Kochanowski University, 5 Żeromskiego Str., 25-369 Kielce, Poland

³ National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”, 37 Beresteyskiy Ave., Kyiv, 03056, Ukraine

⁴ Mykola Yarmachenko Institute of Special Pedagogy and Psychology of the NAES of Ukraine, 9 Berlynskoho Str., Kyiv, 04060, Ukraine

E-mail: helenakyiv2017@ukr.net, darlyngpetra18@gmail.com, oks.ovch@hotmail.com, strubachev@i.ua, snizhanatrykoz@gmail.com

Abstract. The article highlights the practical experience of implementing digital educational hubs to support civic education (CE) to ensure sustainable development. The role of the digital educational hub as a modern tool of the digital educational environment was determined. The digital educational hub is a multi-functional digital educational environment with electronic resources, tools, technologies and educational materials where organisational and pedagogical conditions are created for the acquisition of knowledge, the development of students' competencies and the effective accumulation of intellectual potential, which contributes to professional development and the implementation of innovations in practice. The purpose of this article is to investigate how digital educational hubs support civic education at school, how teachers and school leaders can use the resources of the hubs, and how teachers in Ukraine and other countries are supported in using digital tools for teaching civic education subjects, which are important for the professional development of teachers, including the development of their digital skills. The experience of using digital educational hubs supporting CE at schools in Ukraine and European countries (Belgium, Canada, Netherlands) is described. The practical significance of the digital educational hub, as a component of the digital educational environment, is to support and implement innovations in school education that contribute to the development of the personality of a modern citizen, an active member of the digital society. The novelty of the research: online learning and remote forms of communication are the most popular in education today. For teaching civic education, there is a combination of active forms of learning with the use of digital means and resources, which are actively offered by digital educational hubs. Highlighting the best practices of such use is important both for the professional development of teachers and for the diversification and activation of students' civic education. The practical significance based on the experience of European countries, forms and approaches to the use of digital educational tools for teaching civic education has been identified. Methods of using digital hubs to support civic education at school need further research.



1. Introduction

The development of science and technology is transforming, developing and improving old and creating new forms of organisation of human life, optimising and modernising them. Globalization and integration processes in modern society transform education and require the joint efforts of all educators, which leads to the renewal of approaches to the organization of education processes and, in turn, to the creation of a technologically saturated educational environment. International Telecommunication Union (ITU) and the United Nations Development Program (UNDP) adopted the Sustainable Development Goal (SDG) Digital Acceleration Agenda stating that “Digital technologies have a powerful multiplier effect, both positive and negative, and so it is vital to ensure that their use minimises any increase, entrenchment, or exacerbation of inequality, especially as very real gender, location, and broader digital and data divides exist. Intentionally inclusive approaches to digital development – which place people and the protection of human rights at the centre – are vital in ensuring that the risks of digital transformation are proactively addressed and that no one is left behind” [1]. An important factor that influenced the emergence of digital educational hubs as a centre for learning was not only strategies aimed at the digitisation of education and science in the world but also the circumstances in which the world educational community found itself due to a significant period of the COVID-19 quarantine, limited access to educational institutions and resources. According to the latest data of the international PISA study conducted in 2022 compared to 2018, mean performance fell by ten score points in reading and by almost 15 score points in mathematics, which is equivalent to three-quarters of a year’s worth of learning. The decline in mathematics performance is three times greater than any previous consecutive change. One in four 15-year-olds is now considered a low performer in mathematics, reading, and science on average across OECD countries. This means they can struggle to do tasks such as using basic algorithms or interpreting simple texts. This trend is more characteristic of 18 OECD countries and economies, where more than 60% of 15-year-olds are falling behind [2].

This indicates the loss of stability and consistency in education systems and calls for finding effective solutions for equal access of students and teachers to educational services, among which digital technologies are considered important today. On the positive side, according to PISA 2022, on average in OECD countries, about three-quarters of students are confident in the use of various technologies, including learning management systems, school learning platforms and video communication applications [2]. At the same time according to UNESCO, 45% of national curricula frameworks of 100 countries did not refer to climate change; 40% of teachers are confident teaching cognitive dimensions but only 20% can explain well how to take action. This shows that the digital environment is important for students, which is the digital solution that ensures stability and access to learning and the involvement of students in the educational process [3]. It is obvious that today environmental education, as a harmonious part of civic education, contributes to pedagogical and social mobilisation strategies, which, based on the development of scientific, civic social and emotional competencies, strengthens the harmonious relations between children and youth in society and contributes to its sustainable development.

The Global Education 2030 Agenda UNESCO, as the United Nations specialised agency for education, is entrusted to lead and coordinate the Education 2030 Agenda, which is part of a global movement to eradicate poverty through 17 Sustainable Development Goals by 2030. Education, essential to achieve all of these goals, has a dedicated Goal 4, which aims to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” [4]. In this context, the Education 2030 Framework for Action guides the implementation of this ambitious goal and commitment [5].

One of the elements of the information and digital educational environment is the digital educational hub. The tools and the instruments of digital educational hubs can support any educational field, in particular the sphere of civic education (CE). The use of digital educational

hubs aimed at specific topics is a new practice today. In education, this practice demonstrates the need for students and teachers to combine informational and educational resources to achieve pedagogical goals. Therefore, the study of the best educational experience of using digital educational hubs for the implementation of civic education is important and can be applied to the further development of digital education. Active citizens need political and civic foresight so that they can become constructive agents of change that can effectively contribute to building a new society of the future in harmony with nature. New technologies and science can help in this regard, as well as in more efficient use of resources. We will focus on modern digital educational hubs aimed at civic education and the formation of students' key civic competence.

2. Literature review

An important issue that is considered today by the educational community and many authors is the issue of education for sustainable development in the future. It is about the fact that education for a sustainable future is needed today more than ever before. Education for sustainable development needs to be strengthened given the current social economic and cultural context. It should be community-oriented, with knowledge and observance of natural laws, sociological imagination, and political insight to make it more suitable to meet the challenges of the 21st century [6]. Research is also devoted to what are the key problems in school, and higher and professional education from the perspective of sustainable development. Of great interest are the works on how it is possible to link sustainable development and learning, economic and moral interdependence of people and nature, management, assessment and evaluation of learning and globalisation [7]. Modern researchers claim that digital technologies today are an integral part of the educational process and provide significant benefits for teachers and students. They provide access to a significant amount of information and various bodies of knowledge and also facilitate direct communication, which is not limited in space and time. Scientists are also investigating how modern digital technologies, such as gamification, contribute to the development of skills and behaviour in the context of sustainable development [8]. Researchers emphasise the role of ICT, which they play in the human capacity development for sustainable development through the revision of competency-based education and training, in particular, it provides the opportunity to transition to sustainable economies, environments and societies by equipping persons with skills, knowledge and attitudes that motivates the adoption of sustainable lifestyles [9]. Ukrainian researchers examine contemporary problems in education related to sustainable development [10]. A group of scientists considers the issue of sustainable development through the prism of challenges and opportunities of sustainability in various domains [11].

The studies of Ukrainian scientists are dedicated to the justification of the theoretical and methodological foundations of digital humanistic pedagogy [12]. Scientists emphasise that modern educational processes in physical and virtual space, where ICT is used, are interconnected. The applied research is devoted to the problem of building an information and digital educational environment was carried out by a group of scientists, considering the design and use of a cloud-oriented educational environment [13–16]; technologies for using network resources in the educational process and synthetic learning environment [17]. A significant part of the studies is devoted to the development of information and communication/digital competence and modelling of the modern digital educational environment [18]. The experience of European countries related to the creation and use of the information and digital educational environment was also highlighted by Ukrainian researchers [19]. The peculiarities of the development of civic education in the digital educational environment are considered in the works of a group of scientists. The aspects, that are revealed are the following: the development of a computer-oriented educational environment for multicultural education of students in the countries of the European Union [20]; the use of digital learning tools in the professional activities of teachers to ensure sustainable development and democratisation of education in European countries [11,21].

Conceptual approaches to civic education are highlighted in the works of foreign authors [22]. According to Bîrzéa [22], civic education is aimed at fostering democratic citizenship; it is a set of practices and types of activities aimed at improving the preparation of youth and adults for active participation in democratic life through the realisation of their rights and responsibilities in society.

The issue of the creation, implementation and development of educational hubs as an innovative component of the educational environment in higher education institutions is highlighted by Bondar et al. [23]; the place of the hub in modelling processes of internationalisation of higher education was studied by Hrynkevich and Lutchny [24]; problems of so-called hub schools and the role of educational hubs in the process of the future teachers training studied by Ozminska [25]; Fedulova defines the ICT component and features of innovation and technological hubs [26]; Knight write about international educational hubs and gave analysis of 10 education hubs in Asia, Africa and the Arab states of the Persian Gulf region [27]; the problem of the school as a hub of educational and public space was investigated in the works [28,29].

However, the issue of creating, using and developing digital educational hubs to support and promote civic education as an element of the information and digital learning environment has not been sufficiently researched.

3. Research results

In today's world, the free use of ICT plays an important role, which affects the acquisition of life skills, as well as the ability for effective cooperation and communication, which ensure the identification of a conscious and active citizenship position, as well as the implementation of the idea of digital citizenship. This is also reflected in the social component of the concept of sustainable development. Sustainable Development Goal (SDG) Digital Acceleration Agenda emphasise: "National digital transformation must be a whole-of-society effort – including leveraging the catalytic power of a whole-of-government approach, the digital talents and expertise of the private sector, and most crucially the credibility and expertise of civil society" [30].

The requirements of the modern digital society activate a renewed vision and innovative approaches to the organisation of human activity and education in particular. Innovations in the early 2000s became a new model of organising professional activities, in particular, co-working, collective offices, and hubs. The concept of a hub is widely used in the transport industry and the field of ICT, it namely means a centre of activity, attention or a central node of a network. In a broad sense, a modern hub is a centre where various resources are collected, cooperation and communication are carried out, experience is gained, training and education are held, and new ideas are accumulated, the implementation of which requires the involvement and unification of like-minded people, the use of resources and tools for the intellectual development. Activities carried out in today's technologically oriented world occur both in real and virtual space. According to the place of deployment, the hub can be: real, created based on a physical object (premises); virtual, which is placed online on special means (servers); combined, which combines the features of both real and virtual hubs. Thus, the hub is a network of partners and uses the capabilities of educational and scientific institutions, their resource base and scientific achievements, a kind of "innovative and technological hub" as "a new stage in the comprehensive use of opportunities and resources organisations, as well as companies to create joint products and provide services through the implementation of technology-dominant projects" [26]. N. Bondar, V. Gubenya, I. Pidtilok, and L. Sharan describe the hub activities in the working space and note that seminars and training, creative and musical meetings, the functioning of the library and cross-booking can be a part of the hub working processes [23]. Researcher J. Knight considers the hub to be an educational innovation

in the field of higher education and identifies three types of hubs: student hub, hub talents and knowledge/innovation hub [27]. Hrynkevich and Lutchyn highlight the role of the educational hub as an innovative form of institutionalisation of rapprochement processes, and integration of national educational systems and their institutions into the global educational environment [24]. Based on the above-mentioned opinions, the digital educational hub can be characterised as a multi-functional component of the educational space with the use of ICT. It can be created to unite and concentrate digital educational resources, tools, and technologies. The hub should provide organisational and pedagogical conditions for the acquisition of knowledge, the formation and development of competencies, the implementation of cooperation and communication of participants in the educational process (students, teachers, heads of educational institutions, students, post-graduate and doctoral students, scientists, parents, public organisations and all interested persons). It is organised to support learning, the development of ideas and the exchange of experiences, acquiring connections with like-minded people and their associations. This contributes to the creation of innovations and their implementation in education, project activities, professional and personal self-development and self-improvement. Educational hubs are aimed at collaboration in any educational field, in particular, civic education. This educational space provides an opportunity to efficiently and quickly accumulate intellectual potential for solving urgent problems, and discussion of acute issues related to theoretical and practical aspects of civic education.

Sustainable Development Goal (SDG) Digital Acceleration Agenda (International Telecommunication Union (ITU) and the United Nations Development Program (UNDP) UNICEF) showcase 34 digital solutions, two for each SDG, highlighting the power and potential of digital. There are Learning Passport (mobile online and offline learning platform) and Atingi (online learning platform)/ Digital solutions for the training of teachers for the 4th SDG Goal. Also, Digital Education Hubs and digitally supported Regional Training Centres can increase the number of teachers who are considered qualified according to national standards. Globally, around one teacher in seven does not have this level of qualification, risking sub-par educational outcomes for their students. For example, Mobile Innovation Hub: Platforms for Tomorrow is an accelerator program to support local and digital innovation ecosystems by facilitating investment, helping to build start-ups and delivering training.

A good example of a thematic digital educational hub is the Dutch project Club of Hubs “Digital Calendar Blocks” (<https://cultuursnack.nu/>, Arnhem, the Netherlands). The hub unites all participants in the educational process, as well as museums, libraries, archives, etc. Tools for creating and using educational materials on smart boards and tablets in the form of calendars on a certain topic are offered on the hub’s free digital platform. Members of the hubs club can create their own digital calendars, share experiences, and use the resources of other hubs. Most digital calendar topics can be used to teach history, geography, languages, media literacy, biology, and technology. They also contain topics of civic education. CE is implemented in the Netherlands across all subjects. For example, the themes “Helderland memories – 75 years of freedom” and “Battle of Arnhem” are dedicated to the events of the Second World War and the liberation of the Netherlands from fascism. The cities of the Netherlands are told by the calendars “Eindhoven”, “Valkenswaard”, “View of Arnhem”, “Digital block calendar South Holland”, and “Breda, 2019 view”. These calendars contain interesting facts related to a certain city of the Netherlands and have photos in thematic blocks. Each block can be accompanied by meaningful text, dates of events, questions for discussions, and topics for research. The space of the digital educational hub can be developed and integrated into the digital educational environment of the educational institution (school, teaching office, higher education institution, extracurricular education institution, etc.). The educational digital hub for CE supports the school subject “People and Society”, it was created in the educational environment of the leading Flemish publishing house “Die Keure” (<https://www.diekeure.be/educatief/hub/>),

which takes active participation in the process of education development in Belgium. The functioning of the Digital Education Hub of Flanders is aimed at such important aspects of CE as the formation and development of civic, communicative and ICT competencies, as well as competencies related to financial literacy, cooperation, etc. The publishing house has created an original methodology for teaching subject “Man and Society” in a secondary school in the Dutch-speaking part of Belgium. The teacher can work based on the modular method. Six thematic electronic journals are offered for working with students. Six modules can be used in any sequence. E-zine topics include elements of civic education, including Life, Nutrition and Health, Back to Business: Entrepreneurship and Charity, Game On Gaming and Social Media, Passage: Travel and Nature, “Grinta: sport” and “Fear of Public Speaking: music, cinema and theatre”. The publishing house created an online educational platform “POLPO” (<https://www.polpo.be/>) for teachers. Educators can use resources and tools to create their learning designs, apply a differentiated approach to teaching, and evaluate both students and themselves. An educational hub can function both by itself and as part of a network of hubs. The network can be deployed purposefully, and hubs can join the network themselves, attracting new members. The national network of multimedia education in the Netherlands “Filmeducatie” (<https://www.filmeducatie.nl>) supports citizenship education. “Filmeducatie” launched a project to create a National Network of Multimedia Hubs in Education in 2019. The project is gaining popularity and the network of hubs is expanding. Pupils, students of pedagogical institutions of higher education, teachers and lecturers from universities, parents, and civil society organisations can cooperate in hubs. Everyone can collaborate, propose ideas, get involved in projects, use resources, educational materials, video lessons and lectures, attend educational and cultural events, school performances, museums, libraries, etc. Digital educational hubs offer professional development courses for teachers. Teachers can remotely develop civic and digital competencies, learn new methods and forms of work, and use multimedia tools and ICT in professional activities. “From critical viewers and media creators to creative conscious citizens” is the mission of the Film HUB Gelderland hub. For the 75-th anniversary of the commemoration of the end of the Second World War, celebrated in the Netherlands in 2020 at the national level, a package of lessons “75 years of Freedom – War and Freedom in Pictures” has been created for teachers in the digital education hub “Beeldung”. Teachers of civic education and teachers of other subjects who implement it in their lessons can use educational materials, show films and discuss with students the topic of war, human rights, democratic values and freedoms. Conceptually, the construction of the hubs of the National Network of Multimedia in Education of the Netherlands “Filmeducatie” is maintained in a single key, which is reflected on the Internet pages: an interactive map of the province is divided into municipalities and contains info-graphics that offer information about current events that take place in the field of film and media education, offers of cinemas, festivals, events in cultural centres, libraries, organisations and institutions of the province. The teacher can select the necessary resources for working with students using filters. This allows you to search by level of education: primary, secondary and senior, as well as by type of event, and type of activity. Information about educational platforms, cultural and educational coordination centres, schools that have joined the hub, etc. are collected in digital educational hubs. Teachers who have joined the work in the hub post their web pages, pages on social networks, and blogs. The hubs’ web pages offer news, interesting facts, articles, issue newsletters and much more. You can also join the hub via the pages of social networks Facebook, LinkedIn and Instagram.

The creation and deployment of educational hubs is also inherent in Ukrainian education, which is associated with the impact on the educational environment of such factors as the rapid development and penetration of digital technologies into educational processes, the need to switch to remote forms of education for schoolchildren during the COVID-19 pandemic, and limiting access to school infrastructure in wartime.

In 2020, the Ministry of Digital Transformation of Ukraine initiated the creation of a network of digital educational hubs across the country. These hubs were established in libraries and other public places and were equipped with computers with Internet access. Such an initiative was carried out with the aim of providing an opportunity for everyone to come and learn how to use digital tools and resources and acquire digital skills. Also, for the organisation of training, UNDP and Sweden over the past three years supported the Ministry of Digital Transformation of Ukraine in building a network of hubs, as well as training their coordinators and users.

The number of Ukrainian educational hubs is growing every year. Among them are: “Osvitoria Hub”, Kyiv (<https://hub.osvitoria.org>), “Spalah”, a network of educational hubs (<https://spalah.com.ua>), “HUB School”, Vinnytsia (<https://hubschool.com.ua>), “World School Hub”, a network of licensed international schools in Ukraine (<https://worldschool.com.ua/>), international network “Impact Hub” (<https://impacthub.odessa.ua>), “Long Hub”, Dovge, Transcarpathia, independent educational corporation “TeachHUB” (<https://teach-hub.com/>), “Kid’s hub” network of the public organization “Crimean Diaspora”, “Education HUB” (<https://edhub.com.ua/>) and many others are currently operating in the Ukrainian educational space. “Educational Hub of the City of Kyiv” is a powerful tool of the Ukrainian information and digital educational environment (<https://eduhub.in.ua>). This hub has a resource base that works in the format of blended learning, provides training and testing for the development of soft skills, promotes lifelong education and supports sustainable development. Meetings with successful and well-known Ukrainian political and cultural personalities are held on the grounds of the “Club of Prominent People” of the “Educational Hub of the City of Kyiv”, intellectual games championships are held, professional orientation events and much more are organized. The implementation of civic education is carried out by the “Learning Hubs” network, which involves 40 schools in Zakarpattia, Donetsk and Luhansk regions. One of the initiatives is the educational project “Active Citizens”. The project gathered active young people to create changes on the ground. Creating conditions for interaction and cooperation of teachers, professional mastery groups are held in the hub. As the members of the Network note, partnerships and cooperation contributed to its creation. Uniting hubs into a network allows coordination of joint actions, helps to strengthen organisational potential, helps to join efforts for the implementation of ideas and projects, to learn and exchange experience. An educational hub can function both independently and as part of a network of hubs. A network of hubs can be deployed purposefully, and independent hubs can join the network and attract new members to it.

Educational institutions train teachers, carry out teacher training and are involved in the process of creating hubs. Thus, the All-Ukrainian Educational Hub of Pedagogical Innovations of the New Ukrainian School was created based on the Cherkasy Regional Institute of Postgraduate Education of Educators of the Cherkasy Regional Council in 2020. It became the basic centre for the accumulation and distribution of the author’s methods, technologies, models of the educational process and management activities, innovative methods and forms of work, and professional development of teachers.

“Skills Hub” of the Pavlo Tychyna Uman State Pedagogical University is an example of the implementation of CE and its elements. Participants learn “soft skills” at workshops and seminars, learn teamwork skills, and time management (optimal organisation of time to solve current tasks) and develop civic competence. Pupils and students are offered to create and make speeches in the format of “TED Talks” – a project of the US non-profit organisation “TED Conferences” (<https://www.ted.com/>). The project has been spreading “ideas that will change the world” since 2006. A collection of audio and video files of the best speeches, which can be accessed for free, is available on the Internet. Since 2017, civics education has been fully implemented in programs for grades 5-9. This approach requires training of teachers, providing them with high-quality educational materials and free access to them. Today, few educational

environments are aimed at forming the civic competence of teachers and students. The website of the “New Age” project of the All-Ukrainian Association of Teachers of History and Social Sciences “3D-Democracy” – “Citizen’s Workshop” (<https://citizen.in.ua/about.php>) and the educational platform “We Live in Democracy” (<https://living-democracy.com.ua/>) are actively working.

The educational platform “Living in Democracy” (<https://living-democracy.com.ua/>), launched as part of the Swiss-Ukrainian project “Development of Civic Competences in Ukraine – DOCCU” with the assistance of the Government of the Swiss Confederation, offers resources of the Council of Europe with education for democratic citizenship to conduct lessons and events on the topics of democracy, human rights and civic participation. The web pages of the platform contain educational materials, legal documents, video materials, illustrated cards about children’s rights, and several Council of Europe manuals, in Ukrainian translation, including: “Teaching democracy”, “Growing in democracy”, “Living in democracy”, “We take participation in democracy”, “Exploring children’s rights” and “Teaching democracy”. Pupils, parents, teachers and school leaders can find useful information on social welfare issues, learn, develop and improve themselves. The digital educational hub, as already mentioned, is an environment for joint educational activities. The current state of ICT development offers a wide variety of tools to make the hub full of ICT, which will make access to it open and provide an opportunity to more fully realise its functions. The hub can be created for a separate subject, topic, project or educational direction. The resources posted on the website of the 3D-Democracy project “Citizen’s Workshop” (<https://citizen.in.ua/about.php>) are aimed at supporting students and teachers of civic education. The educational platform “Living in Democracy” (<http://www.living-democracy.com.ua>), launched as part of the Swiss-Ukrainian project “Development of Civic Competences in Ukraine – DOCCU” with the assistance of the Government of the Swiss Confederation, offers resources of the Council of Europe with education for democratic citizenship to conduct lessons and events on the topics of democracy, human rights and civic participation. The web pages of the platform contain educational materials, legal documents, video materials, illustrated cards about children’s rights, and several Council of Europe manuals, in Ukrainian translation, including: “Teaching Democracy”, “Growing in democracy”, “Living in Democracy”, “We take participation in democracy”, “Exploring children’s rights” and “Teaching democracy”. Pupils, parents, teachers and school leaders can find useful information on social welfare issues, learn, develop and improve themselves. The digital educational hub, as already mentioned, is an environment for joint educational activities. The current state of ICT development offers a wide variety of tools to make the hub full of ICT, which will make access to it open and provide an opportunity to more fully realise its functions. The hub can be created for a separate subject, topic, project or educational direction. The resources posted on the website of the 3D-Democracy project “Citizen’s Workshop” (<https://citizen.in.ua/about.php>) are aimed at supporting students and teachers of civic education.

After reviewing the existing experience we propose to create digital educational hubs to support civic education based on educational institutions, which can serve as a component in the digital educational environment and contribute to the achievement of the goals of sustainable development. The digital educational hub, as already mentioned, is an environment for joint educational activities. The current state of ICT development offers a wide variety of tools that allow for open access to the hub and more fully implement the hub’s functions. The hub can be created for a subject, topic, project or educational topic. Figure 1 presents the author’s vision of a digital resource hub to support CE. Therefore, a digital resource hub for civic education may include the following resources: manuals and methodical recommendations on CE; bank of ideas and innovations; online networks with CE (domestic and international); access to participation in CE projects; student initiatives and SE portfolios; portfolio of teachers who teach civic education

or implement its elements in their lessons; questionnaires, tests and monitoring tools; platforms for communication and exchange of experiences among colleagues, students, and parents.

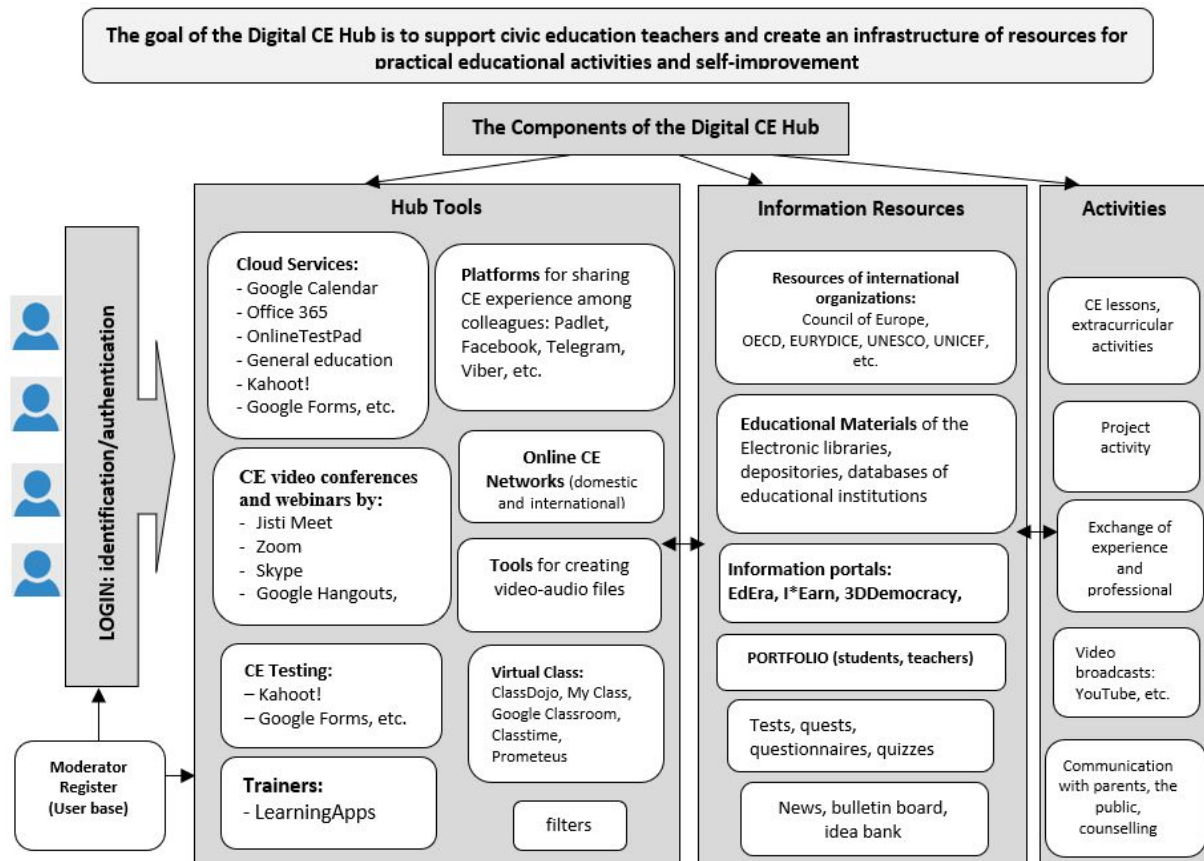


Figure 1. The vision of the digital hub for civic education (CE) support in schools.

Therefore, a digital hub for civic education (CE) may include the following elements: 1) conceptual and strategic documents on CE issues: legislative documents and concepts in the field of general secondary education, educational standards, strategies for implementing CE in the education system in Ukraine, international declarations and conventions in the field of human rights protection, relevant recommendations of the Council of Europe, UNESCO, UNICEF, UN and other international institutions working in the field of human rights protection and civic education; 2) CE manuals and methodological recommendations (domestic and international developments for the implementation of civic education, standards and framework approaches, curricula and thematic modules, references to the legislative framework of Ukraine on the protection of human rights and international documents, declarations and conventions in the field of human rights protection); 3) references to the online CE networks (domestic and international): a list and links to networks offering informational materials, and educational resources for improving the qualifications of teachers in the field of civic education; 4) access to participation in CE projects: descriptions and links to civic education projects implemented in Ukraine and abroad, eg. The Democratic School Project (European Wergeland Center, Oslo, Norway); 3-D Democracy project (Nova Doba Association) etc.; 5) references to the student initiatives and portfolio: description of student research, projects, examples and results of competitive student works, including works submitted to thematic Olympiads, creative works, and festivals; 6) banks of surveys and monitoring tools: questionnaires and data, tasks, quests,

test tasks and examples; 7) links to the platforms for sharing experiences among colleagues, students, and parents; links to professional pages on social networks Facebook, Linked In, and Instagram, web pages, portals, platforms and resources for sharing experiences, blogs, YouTube channels, other digital resources of professional communities on CE issues; 8) bank of ideas and innovations for further implementation and development of CE in school: project proposals, methodical developments, scenarios of CE events; 9) electronic libraries and databases: links to libraries, and depositories, including state institutions, research organisations, museums, cultural centres, and public organisations (domestic and international).

Technical support of the digital educational hub for the implementation of CE should include a set of services aimed at ensuring the reliable, safe and secure functioning of equipment and services of the network, computing and engineering infrastructure of the environment.

Creative teachers should be supported in creating and using digital educational hubs to solve civic education problems. This activity can contribute to their professional and personal development. It is also important to consider the possibilities of civil society organisations offering civic education programs and projects for students and teachers.

Association of Innovative and Digital Education in Ukraine provides support and psychosocial assistance services for children and youth with the financial support of UNICEF in Ukraine. The Project Digital Learning Centers (SPILNO DLC) involves 16 digital learning centers in the communities of Mykolaiv, Odesa and Kherson regions, which will provide catch-up education for students, life lessons on the most popular modern skills of the 21st century related to the Civic Education topics, as well as career guidance, various training and remedial programs, psychosocial support and training for 30 thousand students from 7 regions, as well as teacher training and psychosocial support for teachers and school psychologists (<https://www.aide.one/en/projects>). Training courses for teachers, dedicated to subjects related to civic education, such as “Media Literate Resistance: Building Reasoned Dialogues” and “Media Literate Resistance: Communicating on Equal Terms” have been developed for teachers within the framework of the project “Study and Distinguish” with the support of IREX on the SPILNO platform (<https://eduhub.in.ua/category-course/onlayn-kurs-mediagramotniy-sprotiv>).

The importance of research and surveys of teachers and students that highlight the experience of civic education in different countries should also be emphasized. This is important for highlighting the best practices of teaching civic education and developing own methods, models and approaches to support civic education, including through digital educational hubs.

Digital educational hubs to support civic education are a relatively new phenomenon in education and this is related both to the significant quarantine period when teachers were forced to teach online, and to the development of technology and the transition to new technological solutions in education, and most importantly, the need to provide access to resources and training for teachers and students.

The best-known international research is the International Civic and Political Education Survey (ICCS), which is conducted every five years and assesses the knowledge, skills and attitudes of 8th-grade students in civic education (<https://www.iea.nl/research/iccs>); The Program for International Student Assessment (PISA), which is conducted every three years, includes a citizenship education module that assesses the knowledge and skills of 15-year-old students (<https://www.oecd.org/pisa/>); The European Values Study (EVS), conducted every nine years, examines the values and attitudes of citizens in various European countries, including issues related to citizenship education (<https://www.europeanvaluesstudy.eu/>).

Digital civic education hubs are important tools for disseminating knowledge about civil rights, democracy, social justice, and other aspects of civil society. These hubs provide access to learning materials, interactive resources, information sources and communities for acquiring citizenship knowledge and skills.

Having analysed the support of civic education through digital educational hubs and taking into account that civic education and education for democratic citizenship in different countries can be considered as an integrated course, a framework, or a program, certain approaches to the implementation of this direction should be singled out: a) at the political level: support for digital civic education hubs can be implemented through the initiation of programs, including cooperation programs with international organisations, such as UNICEF, UNDP, the Council of Europe, and the international technical assistance programs. Governments can develop national strategies and frameworks that recognise the importance of understanding the role of citizenship education from regional and national perspectives; b) in the classroom: civic education can be taught as an integral part of existing subjects – from geography to social studies, using the resources of digital educational hubs and projects containing civic education topics; implement school projects and create digital school communities for civic education; teachers can incorporate materials that build awareness of civic values. For instance, in Geography and Social Sciences, pupils can learn about countries and their political systems. Teachers can also assign students a group digital project where they will have to devise a campaign to address civic knowledge in their local community; c) at the level of professional development of teachers: use the opportunities for professional development in the use of digital educational resources, in particular from CE, as well as other subjects to acquire digital skills and master new methods, practices and methods of learning; d) at the level of civil society and out of class activities: to engage the capabilities of public organisations, including the created digital hubs to engage teachers and students in communication and learning about civic education and with the civic society, the initiation of educational activities for a broad interested public on issues of civic education.

4. Conclusions

Having conducted an overview of the existing experience of the use of digital educational hubs in the field of civic education conclusions and recommendations can be useful. Civic education is an important part of sustainable education and development all over the world. Turning to the issues of civic education and education for sustainable development, it should be noted that Ukrainian school programs do not provide separate subjects from these topics, and Civic Education as a separate subject is studied for only one year in the 10th grade. Sustainable development as a concept remains insufficiently mastered by the teachers, who are focused on teaching subjects and testing students' acquired knowledge. Cross-cutting skills and abilities (soft skills), which should be the result of education for sustainable development and the formation of competencies for democratic citizenship, are very important in the process of assessment of the students' achievements.

The latest changes in the shift to the distance and blended mode of learning proved the effectiveness and usefulness of effective digital technologies when teaching CE in schools. It refers to the wide and open access to CE information resources, widening the possibilities to communicate without borders, and to obtain knowledge at any time and place etc.

The author's vision of a digital resource hub to support civic education is presented in the main components (digital tools resources and activities) that are aimed at the support of civic education teachers to create and use an infrastructure of resources for practical educational activities and self-improvement. It is worth paying attention to such recommendations regarding its components as a bank of ideas and innovations for further implementation in the educational process; digital platforms for communication and tools for evaluation and questionnaires; hub pages in social networks, blogs and sites of teachers conducting training, seminars, lectures, workshops.

A digital civic education hub can be created based on a general secondary education institution, an out-of-school education institution, a post-graduate education institution, a civil

society organisation, a scientific institution, or be a part of the regional educational authorities and professional teachers' associations. It is important to provide the tools of the digital educational hub with free access and adjustment of the organisation of distance learning and the opportunity to join the educational process for all those interested, regardless of their location and time. The functioning of the digital educational hub should be focused on the development of civic competence and, at the same time, digital competence through the integration of elements of online learning and the use of digital tools for the dissemination of civic education. The digital educational hub for civic education is an element of the information and digital educational environment, modernises and strengthens it, ensuring the development of civic and digital competence of participants in the educational process; digital educational hubs can be used to create thematic, branch, subject, etc. educational environments; creation of a network of digital educational hubs on issues of civic education will contribute to ensuring the quality of education in general. As stated in Goal 4 "Quality Education" of the Concept of Sustainable Development [30], education is "one of the most powerful and proven means of sustainable development" and plays an important role in the formation of a citizen and the development of a civil society built on the principles of democracy.

It was also explored that digital education hubs offer different support for the implementation of citizenship education. This includes the placement of educational materials, project activities, professional communities for teachers and thematic communities for students, resources and links for familiarization, exchange of experience.

Since civic education is an integrated direction in the school curriculum, it is worth paying attention to such important aspects as continuous professional development of teachers regarding the use of digital tools for social science subjects, motivation and involvement of teachers in professional communities, joint learning and exchange of experiences, psychological support of teachers. It is also important to work outside the classroom with students, involve civil society in the implementation of student projects, create opportunities for dialogue and exchange of opinions. Equally important is the technical support of digital educational programs and their popularization among parents and school leaders.

The conducted research does not exhaust the interest in finding better opportunities for Ukrainian teachers and students regarding the development and use of digital educational hubs for civic education. Ukrainian students and teachers need to get acquainted with the experience of foreign countries, to implement the best practices of using digital tools for civic education.

Therefore, further research is needed to study the forms and methods of using digital educational hubs for teaching school subjects in different countries, in particular civic education, monitoring the activity of students in such hubs, and studying the interests of students for further education and expanding the range of opportunities for students and providing them with open access to educational opportunities regardless of location and current situation in the country.

The perspectives of further research also can be realised in the field of ensuring scientific and methodological support of digital sustainable education in schools; teachers' professional development in the field of the use of ICT for CE teaching; monitoring of the influence of digital technologies and in particular the use of educational hubs on the results of students' achievements.

A digital educational hub for civic education, where the teacher has free access to electronic resources, online tools for the development of educational materials, evaluation, testing, surveys, involvement in online platforms for education, professional development, communication and exchange of experience, etc. at any time and in any place, can contribute to the solution of the problems that have deepened the educational gaps caused by the military aggression of the Russian Federation against Ukraine.

ORCID iDs

O O Hrytsenchuk <https://orcid.org/0000-0002-0991-2343>

M P Leshchenko <https://orcid.org/0000-0003-0789-0272>

O V Ovcharuk <https://orcid.org/0000-0001-7634-7922>

S I Trubachev <https://orcid.org/0000-0002-7349-9426>

S V Trykoz <http://orcid.org/0000-0002-5929-589X>

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