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**HUM@N – Digital Transformation in Humanities**

**Intellectual Output 1**

**THE ROLE OF DIGITAL HUMANITIES IN HIGHER EDUCATION:  
UNDERSTANDING THE CHALLENGE OF INTEGRATION**

**Handbook**

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## **Project background and description**

The HUM@N project seeks to develop a set of tools and guidelines intended for higher education educators and researchers in the field of humanities (literature, history, geography, philosophy, etc.) with the aim of improving their ICT skills, their teaching performance, their research work and, consequently, the attainment of their students and their motivation.

Ultimately, the project aims at renewing the traditional forms of teaching in humanities disciplines that are least affected by the digital transformation. As the Working Group on the Modernisation of Higher Education and Digital Skills and Competences stated in Malta in January 2017: "Rapid technological development is transforming the way in which higher education is delivered and students participate. The diversification of the student population requires individualization of learning, more flexible delivery and a greater focus on pedagogies that provide support for learners" (Education and Training 2020, 2019).

Although more and more academic content and tools are becoming open and freely available, students will continue to need local support for learning, which underlines the importance of teachers' pedagogical skills together with field-specific competences. Teaching staff will also need a stronger framework for assessing students' learning outcomes, the value of different technologies and the way or timing of their use.

Teaching staff need skills in both digital pedagogy and discipline-specific digital competences. Authorities and institutions should give priority to flexible approaches that allow for context- and discipline-specific responses rather than one-size-fits-all solutions. This approach has already been set out in the Framework for digitally competent educational organization (RC 2015), which states that "teaching and learning is being 'transformed' to include digital technologies. Building on relevant research, the organization promotes a variety of technology-enabled learning and teaching practices that are flexible, adaptable and engaging" (Kampylis, Punie & Devine, 2015).

In the context of the humanities and Social Sciences, ICT has a valuable role to play. It enriches students' education and promotes the emergence of deep and authentic learning (Gilbert & Hoeppe, 2014, p. 158). Therefore, the HUM@N project investigates the main challenges faced by educators and researchers in the humanities, identifies the most useful and practical tools available and adaptable to different disciplines, and provides the right training contents and tools to support educators in developing their teaching strategy using ICT tools.

The "HUM@N – Digital Transformation in Humanities" project **objectives** are as follows:

- Improving educators' ICT skills and competences.
- Providing teachers with user-friendly and adaptable tools to improve their teaching performance.
- Improving students' motivation and engagement.

**Project target group:**

- teachers of Higher Education Institutions in the field of humanities studies.

**Project activities:**

- Selection of practices and database of available tools.
- Development of the training plan and content based on basic programming and coding skills focused on the needs of the target group.
- Pilot test, including a mobility experience for teachers.
- Evaluation of the pilot experiment from both the higher education teachers' and the students' point of view.

**Expected results:**

- A set of guidelines for the integration of ICT tools in educators' pedagogy.
- A training course on basic programming and coding for teachers.
- A database of tools to be used by educators.

The project consortium was selected on the principle that within the partnership all the different competences must be present to achieve project results and represent the different European cultures, thus to have enough viewpoints and achieve outputs with a strong potential of adaptability and transferability. In particular, there are four higher education institutions representing the different fields of humanities studies from United Kingdom, Slovenia, Romania and Estonia. There are also three different European-wide networks representing the HE sectors, Geographers and Digital Education. Finally, there is a technical partner who supports the partnership in developing the necessary tools.

This Handbook should be cited as following:

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# THE ROLE OF DIGITAL HUMANITIES IN HIGHER EDUCATION: UNDERSTANDING THE CHALLENGE OF INTEGRATION

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## FOREWORD

Researching Digital Humanities has uncovered a remarkable diversity of teaching and scholarship pursued by a diverse group of higher education professionals, embracing an enormous variety of Digital Humanities methods, processes, and activities.

Digital Humanities is not a well-defined or clearly delimited academic field. It is commonly used as an inclusive term at the intersection between the digital environment and the humanities. The complexity of digital humanities comes partly from its disciplinary variety, but also from the multiple modes of activity and the different types of engagement with information technology. The challenge for those working in the HUM@N Project has been to ensure representation in these three main areas, namely discipline, multimodal engagement and the diversity of digital technologies. This allowed this report to deal with and showcase many different kinds of approaches, initiatives and activities.

In terms of teaching and Digital Humanities, many questions need to be addressed. For instance, should the project examine how to involve digital tools in the humanities? Or should it focus on integrating digital approaches in humanities courses? Perhaps educators would be most concerned with the practices and methods of Digital Humanities work. We questioned whether the main challenge was simply about encouraging and enabling university lecturers to use Digital Humanities in the classroom. Or should HUM@N be exploring, addressing and advocating for Digital Humanities as a discipline in its own right? Or should the project be thinking more strategically about Digital Humanities, in order to establish an advisory role in identifying suitable pedagogies in relationship to classes, curricula, courses and even research?

The Covid-19 pandemic affected educational systems worldwide, leading to the near-total closures of universities and colleges. With no clear government guidance in Europe, it has been a challenging time for those teaching there. In order to maintain learning under lockdown, face-to-face university courses have been adjusted, so that, in general, teaching online has become the norm. Universities rushed to move teaching and research online during the coronavirus lockdown, adapting curricula, evaluation methods, support material and assessment systems. Access was provided to technological tools to enable virtual interaction in class and teachers have, almost overnight, been asked to become both digital course designers and tutors, using tools, which few have fluently mastered. The mass use of technology has however revealed many gaps and exposed weaknesses.

It will take a long time to fully understand the long-term impact of the current pandemic. What seems to have become a consensus view is that in the short term the quality of university teaching and learning needs to be prioritised. For those involved in teaching with technology, the Covid-19 crisis provides an opportunity to radically re-think university education, how universities support learning to provide a quality student experience. It is important that we ensure that digitally-enhanced learning is not considered to be just an emergency mode of

operation, but that a virtual culture should be established for universities, with creative implementation to contribute to better learning in the future.

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This Handbook is prepared by the project consortium with partners from Belgium, Cyprus, Estonia, Italy, Romania, Slovenia and Spain. The following academic institutions were involved in the co-creation process: Tallinn University, University of Ljubljana, Dimitrie Cantemir University, European Association of Geographers EUROGEO, European Digital Learning Network, ENIDE and European Association of Erasmus Coordinators.

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# 1. INTRODUCTION



Recent years have generated a huge development in digital humanities. The handbook entitled *The role of digital humanities in higher education: understanding the challenge of integration* provides an overview of the most important traditions of work and the newest perspectives, concepts, insights, and research-based knowledge concerned with digital humanities in higher education. It offers current, international perspectives on conditions in higher education, relevant study on

teaching, learning and researching, contemporary practices in humanities, and implications for the future of digital humanities.

It provides an invaluable resource for scholars as well as educators and all others concerned with the current situation and the future of digital humanities.

## 1.1 How to use this handbook

We have tried to design this handbook to be used as flexible as possible, according to what we expected could be your individual interest and needs. We aimed to provide educators and researchers in higher education with a selection of relevant and accessible case studies and ideas that could be useful for their educational and scientific work, enabling them to meet today's digital challenges.

## 1.2 Defining project foundations

**Humanities** are concerned with human beings and their culture or with analytical and critical methods of inquiry derived from an appreciation of human values and of the unique ability of the human spirit to express itself. The humanities include the study of all languages and literatures, the arts, history, and philosophy (Britannica, 2020) or, with the words of Kaston Tange (2020):

*... a set of disciplines that analyzes how people experience the world and how they express those experiences — in terms of both individual voices and the systems within/against which they operate — and that produces people who can synthesize diverse information in order to make decisions or develop solutions to problems based on considerations beyond their own experience.*

In the period between 1990 and 2000 the concept of digital humanities appeared, initially under the name of humanistic computer science (Humanities Computing) or computer-aided processing of humanistic data (Digitalna humanistika, 2020), although the use of computers to analyse research data in humanities disciplines such as literature and history dates back to the 1940s. At that time, the focus was on the potential of computers to facilitate the creation and sorting of large concordances and thesauri of historical texts (Gavin & Smith, 2012).

Between the 1970s and 1980s, specialists in humanities computing from a number of disciplines concentrated on the development of computational methods to accommodate the complex and diverse structures found in the primary materials used by humanities scholars (e.g. Text Encoding Initiative, innovative database structures). The growth of new network technologies in the early 1990s, including the World Wide Web, and the increasing ease with which non-textual files such as images, sound and moving image could be created and exchanged, led to a sharp change in the way humanities deal with digital technologies (Gavin & Smith, 2012). At that time, the focus was on digitisation and analysis of material in the humanities, but over time it has become more and more about the material that was digital from the beginning. Large-scale digital editions and archives of texts and cultural artefacts from many different eras and civilisations were created. Archives, museums and libraries developed large-scale digitisation programmes to facilitate remote access to their collections, while commercial organisations like Google also began to digitise large parts of the Western cultural heritage. However, the humanities scholars' relationship with their primary materials was not limited to digitisation, but also involved the use of other technologies such as Geographic Information Systems or 3D visualisation (Gavin & Smith, 2012). Today it uses methods from traditional fields of humanities (such as history, philosophy, linguistics, literature, art, archeology, music, culture) and tools of computer data processing (data acquisition, computer analysis, visualization) and computer publishing (Digitalna humanistika, 2020).



Figure 1. Remotely controlled unmanned aerial vehicles (UAVs) contribute to visualisation of cultural heritage and landscape (Šempeter, Slovenia) (author: U. Stepišnik, 2020).

When the term *humanities computing* eventually appeared to be too narrow, the term *digital humanities* was preferred as a description of the increasingly diverse and wide-ranging characteristics of the field, which according to Gavin and Smith (2012) represents the intersection of computing, research, and teaching in the humanities. It requires collaboration and involvement of several skills, disciplines and areas of expertise. Kirschenbaum (2010, p. 56) says that digital humanities is also a social undertaking because “it harbors networks of people who have been working together, sharing research, arguing, competing, and collaborating for many years ... a culture that values collaboration, openness, nonhierarchical relations, and agility”. Burdick et al. (2016) claim that digital humanities, however heterogeneous, is unified by its emphasis on making, connecting, interpreting, and collaborating. It might be said that it acts as a support and upgrade in the work of humanists, which requires many skills such as investigative researching; critical reading; flexible thinking, problem solving, etc. (Kaston Tange, 2020).

*In some respects, I am actually quite conservative (for various reasons) — an old-school teacher who believes that three things are essential for successful and high-quality study (especially from a student's perspective): good books, as much personal contact with the professor as possible, and mutual motivation. I understand everything else as a supplement and in this sense I also use ICT.*

*Participant's personal opinion; HUM@N study 2020*

Nowadays, Digital Humanities strives to bring technology to professional activities, e.g. through text analysis, GIS, cooperation of the professional community, interactive games and multimedia in traditional arts and humanities, as is common in modern social sciences. One

of the aims of the digital humanities is that the humanities not only revolve around texts and articles, but also include multimedia content, electronic databases, and dynamic environments (Digitalna humanistika, 2020), often exploring methodologies and techniques unfamiliar to traditional methods of humanities research (e.g. geospatial analysis, data mining, corpus linguistics, visualization, and simulation). Digital Humanities has enabled humanities scholars to research, experiment and interact with source materials in a way that leads to new insights. As a result, disciplines such as languages and literature, history, music, media and communications tend to incorporate critical digital studies, engineering, machine-learning and artificial intelligence more closely into their work (Berry, 2019).

According to Allington et al. (2016), the first discipline in which computing became centrally important is lexicography, thanks to the work of academic linguists at the University of Birmingham and professional lexicographers at Oxford University Press. The former used the statistical analysis of large volumes of text to study contemporary word usage. The latter continued to produce the kind of historical scholarship they had long been known for, but were able to use new computer technology to store, edit, and typeset their work to produce the 20-volume second edition of the Oxford English Dictionary.

*I sometimes wonder whether a better knowledge of digital technologies would improve my employability. I see a whole range of scholarships for digital humanities. I am a starving academic with no permanent funding and I am obviously doing something wrong.*

*Participant's personal opinion; HUM@N study 2020*

However the academic need for Digital Humanities was growing all the time (Allington et al., 2016) and today Digital Humanities is a broad field of research and scholarly activity covering not only the use of digital methods by arts and humanities researchers and collaboration by Digital Humanities specialists with computing and scientific disciplines, but also the way in which the arts and humanities provide distinctive insights into the major social and cultural issues raised by the development of digital technologies. Work in this field is necessarily collaborative, and involve multiple skills, disciplines and areas of expertise (Gavin & Smith, 2012). In Digital Humanities, there are now opportunities to think, make, enact and experiment in a variety of forms and in collaborations (Nygren, 2017).

A definition from The Digital Humanities Manifesto 2.0 (2009) proposes:

*Digital Humanities is not a unified field but an array of convergent practices that explore a universe in which: a) print is no longer the exclusive or the normative medium in which knowledge is produced and/or disseminated; instead, print finds itself absorbed into new, multimedia configurations; and b) digital tools, techniques, and media have altered the production and dissemination of knowledge in the arts, human and social sciences. The Digital Humanities seeks to play an inaugural role with respect to a world in which, no longer the sole producers, stewards, and disseminators of knowledge or culture, universities are called upon to shape natively digital models of scholarly discourse for the newly emergent public spheres of the present era (the www, the blogosphere, digital libraries, etc.), to model excellence and innovation in these domains, and to facilitate the formation of networks of knowledge production, exchange, and dissemination that are, at once, global and local.*

In order to achieve the above-mentioned goals many activities were proposed among experts in digital humanities. For example, Zorich (2008) wrote in *A Survey of Digital Humanities Centers in the United States*, that the goals of Digital Humanities Center were to further humanities scholarship, create new forms of knowledge, and explore the impact of technology on humanities-based disciplines. To accomplish these goals, some or all of the following activities should be pursued: building digital collections as scholarly or teaching resources; creating different tools (for e.g. authoring, building digital collections, analyzing humanities collections, data, or research processes and managing the research process); using digital collections and analytical tools to generate new intellectual products; offering digital humanities training, lectures, programs, conferences, or seminars on digital humanities topics for general or academic audiences; having its own academic appointments and staffing; providing collegial support in conducting research in humanities and humanities computing (digital scholarship, digital identity, etc.) (Zorich, 2008, p. 4–5).

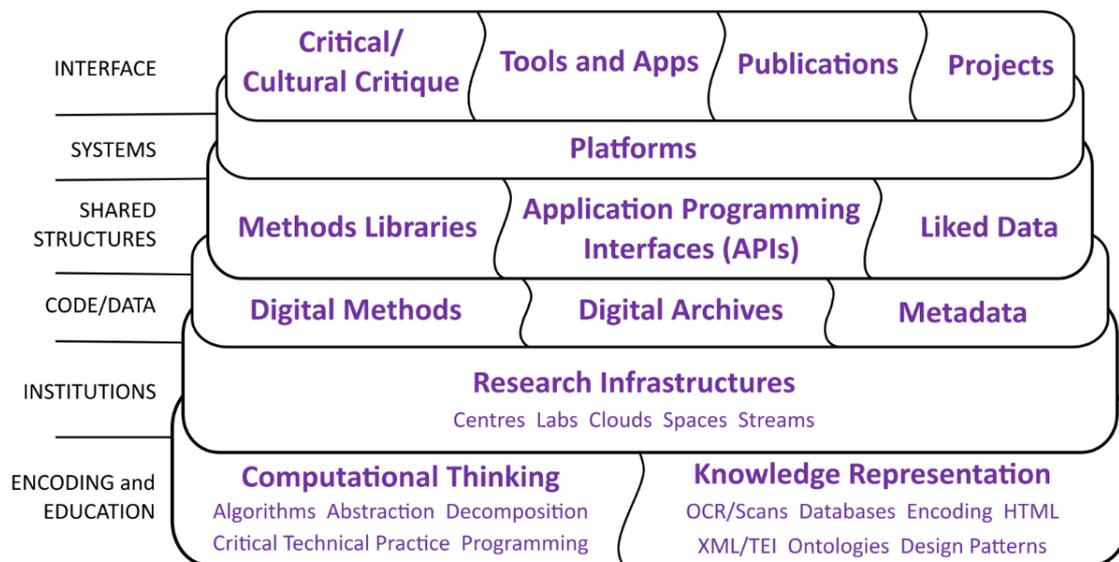


Figure 2. The Digital Humanities Stack (Berry & Fagerjord, 2017)

Berry and Fagerjord (2017) have suggested that one way to reconceptualise digital humanities could be through a 'digital humanities stack'. They argue that “this type of diagram is common in computation and computer science to show how technologies are 'stacked' on top of each other in increasing levels of abstraction”. Here they use the method in a more illustrative and creative sense to show the range of activities, practices, skills, technologies and structures that could be said to make up the digital humanities, with the aim of providing a high-level map (Digital Humanities, 2020).

Example: Engineering (Machine-Learning, Artificial Intelligence)

*In 2014, the psychologists Corti and Gillespie of the London School of Economics coined the term Echoborg. I am ECHOBORG is a pioneering use of Artificial Intelligence (AI) in a conversation with audience/persons to see the impact of automation on people. Online workshops and face-to-face workshops offer a unique experience that enables exciting interaction between technology and people to create a theatrical show or help organisations develop a greater understanding of how conversational Artificial Intelligence might affect their business and clients and provide them with solutions (Berry, 2019).*

### 1.3 Living digital humanities

Research conducted in 2007 at the University of California, Berkeley, on faculty behavior and attitudes indicated a possible chasm between what productive and creative scholars claim to need and what many technological enthusiasts envision. According to Harley (2007), at that time "the lack of faculty willingness to change" was often cited as a key obstacle to the wider adoption of a variety of technologies in undergraduate teaching and other forms of scholarship. On the other hand, today's educators and scholars are still mainly members of earlier generations, i.e. generations that have, to various degrees, moved from an analogue to a digital society, while the digital natives are the pulling force of digital technology's (r)evolution (Calzati, 2020). Reinstating what is perhaps obvious, although sometimes overlooked – i.e. "the encounter in class of two generations that have radically different approaches towards digital technologies – is crucial for highlighting the potential fruitfulness that can spring out of the synergy between today's teachers and students in university" (Calzati, 2020, p. 30).

*Our experience with faculty needs and attitudes raises the question whether or not many 'producers' of technological tools and systems pay much attention to the unconvinced, indifferent, tired, frustrated, or thwarted academic 'consumers'? Or do they simply dismiss many nonadopters as aberrations, luddites, or dinosaurs, with little reflection about the complex reasons why many scholars have not yet embraced the promise of the 'new, new' technological thing. (Harley, 2007)*

Romanov (2016) is convinced that humanists scholars today have access to vast corpora that open up research opportunities that were unthinkable a decade or two ago, although working with corpora requires a very different approach that is characteristic of the sciences rather than the humanities, while the use of such technologies in the university classroom raises a variety of questions. In addition to technical support for students and teachers, which is vital for the effective use of this technology, adequate preparation of resources, protocols and plans is also required (Clarke & Thomas, 2012). However, education has often responded to this paradigm shift more reactively than proactively: most of the times, digital technologies have been implemented in curricula as 'mere' tools of support to otherwise "unchanged teaching practices, rather than as technologies with unique features to be exploited" (Farinelli, 2019 in Calzati, 2020, p. 29). As Hall (2019) says, the answer to the question about the role of Digital Humanities in humanities fields often implies that digital humanities could increase the relevance of established fields for today's students, administrators or funding agencies by introducing new technologies into established practices yet the question is seldom posed inversely: "What can my field offer to DH?".

*At the university, it is not my job to invest time in regularly monitoring students' progress, except for evaluation of their seminars and exams. This is their own responsibility. It is my job to regularly prepare excellent lectures, excellent seminars, and to combine teaching and research in an excellent way (which is not so easy and some professors actually do not manage to do it - they become excellent professors but not researchers or vice versa). It is also my job to always be available for consultations (during office hours and via e-mails, to fully support any research initiative of students). It is also my job to cautiously evaluate all seminars (in terms of contents, structure, editing, work ethnics) and give thorough feedback (which I often do in handwriting in order to save my time - if I do it digitally, I have to check the document again, otherwise there are some misspelled places that do not occur if I handwrite my many comments). Students regularly receive a couple of pages of comments from me. It is also my job to advise student on how to improve their presentation skills. Regularly doing all these I do not consider it my task to regularly monitor the progress by students - it is simply their task while my job is to be always available for any questions and research initiatives they might have.*

*Participant's personal opinion; HUM@N study 2020*

#### **1.4 Learning and teaching perspectives; education policy and ICT**

In the EU, each country is responsible for its own national education policy. Education is therefore seen as a national competence area and EU policy is designed in such a way that it only contributes to addressing common priorities and supporting actions in member states. European Commission is currently working on several policy initiatives in order to modernise education and training, and provides funding for research and innovation to promote digital technologies used for learning. One example of this cooperation is *Education and Training 2020*, a forum established by the European Commission as a strategic framework that allows EU Member States to work together to build up best practices. In the field of higher education, the EC initiated the Bologna Process, which was designed to promote the internationalisation of higher education in Europe through more mobility, easier recognition of qualifications and streamlined quality assurance mechanisms.

The final communiqué of the Paris Ministerial Conference set a new focus on the possibilities of digitalisation (Paris communiqué, 2018; Rampelt et al., 2019):

*Digitalisation plays a role in all areas of society and we recognise its potential to transform how higher education is delivered and how people learn at different stages of their lives. We call on our higher education institutions to prepare their students and support their teachers to act creatively in a digitalised environment. We will enable our education systems to make better use of digital and blended education, with appropriate quality assurance, in order to enhance lifelong and flexible learning, foster digital skills and competences, improve data analysis, educational research and foresight, and remove regulatory obstacles to the provision of open and digital education.*

Although traditional teaching methods are already going through a transformation to adapt to the needs of the 21<sup>st</sup> century students, the start of the Covid-19 pandemic and the closure of universities across Europe forced universities to use digital technologies for the education and training of their students. Many teachers and academics had little experience in online teaching and were generally unprepared to face the challenge (Dolman, 2020). However, several video conferencing platforms such as Zoom, Google Classroom or Microsoft teams were used and educators gradually learned to communicate online, improving their technical skills and teaching strategies. By doing so, they could directly experience whether the use of technology for educational purposes provokes student's curiosity, boosts their engagement and motivation, and leads to better learning and comprehension.



*Figure 3. Teaching methods and tools have changed drastically throughout history. Traditional tools for visualisation (left), are today often replaced with remotely controlled unmanned aerial vehicles (UAVs) (right) (authors: L. Rebernik and U. Stepišnik, 2020).*

*I currently do not see any significant deficits in my abilities to competently handle digital technology in the fields of research and teaching. International cooperation and feedback from students have not revealed any relevant deficits either. This does not mean that such deficits do not exist. Eventually I will become aware of them and then I will learn. At this stage, I find it more important to save existing time for research and reading new publications relevant for my teaching and research than to upgrade my ICT skills.*

*Participant's personal opinion; HUM@N study 2020*

Responding to urgent needs related to the pandemic, a more strategic and longer-term approach was needed. Following open public consultation in 2020, the European Commission announced the establishment of a *Digital Education Action Plan (2021–2027)*. This plan outlines their vision for high quality, inclusive and accessible digital education in Europe and seeks to support the use of technology in education and the development of digital competences. The plan calls for action for stronger cooperation at European level to learn from the Covid-19 crisis, as technology has been used at a greater scale than ever before in education and training. The challenge is to make education and training systems that are fit for the digital age.

Only **39% of teachers** in the EU feel well prepared for using digital technologies in their daily work.

Source: Digital education action plan, 2020.

The two strategic priorities, written in *Digital Education Action Plan*, are:

1. Fostering the development of a high-performing digital education ecosystem, related to infrastructure and connectivity, capacity building and improving organisational capabilities, training teachers and education staff and high-quality content, user friendly tools and secure platforms.
2. Enhancing digital skills and competences for the digital transformation.

**More than one in five** young people fail to reach a basic level of digital skills across the EU.

Source: Digital education action plan, 2020.

As part of the *Action Plan*, for higher education, a European Universities initiative will develop virtual and face-to-face EU inter-university campuses and implement innovative models of digital higher education.

Students attending higher education expect to acquire skills and knowledge that will empower them through personal and professional development to succeed in their future life. The 'skills agenda' from the European Commission states:

*With the right skills, people are equipped for good-quality jobs and can fulfil their potential as confident, active citizens. In a fast-changing global economy, skills will to a great extent determine competitiveness and the capacity to drive innovation. They are a pull factor for investment and a catalyst in the virtuous circle of job creation and growth. They are key to social cohesion (Digital Education Plan; European Commission, 2016).*

The European Commission (2020) announced that a new *European Digital Education Hub* would be created to link national and regional digital education initiatives and actors, support cross-sector collaboration and new models for exchange of digital learning content and address issues such as common standards, interoperability, accessibility and quality-assurance. The Hub will serve as a think-tank, supporting the development of policy and practice, and monitor the development of digital education in Europe, including the implementation of the new Digital Education Action Plan. The Hub will also support user-driven innovation and engagement through the Digital Education Hackathon.

Similarly, the requirements of the 21<sup>st</sup> century classroom in higher education are changing rapidly, where the increasing demands of students and the continuous implementation of technology require large-scale innovation in pedagogy, which is seen as the main contributor for improved student learning outcomes (Daniel & Bird, 2019).

The recent work of Gallardo-Echenique et al. (2016) suggests that most students in higher education are comfortable using digital technologies. Daniel and Bird (2019) claim that contemporary pedagogical practices in higher education promote student-centred approaches that involve active engagement in the classroom and a higher degree of digitalisation of learning materials. Educators are expected to follow student expectations and feedback as a way to transform pedagogy (Kane & Maw, 2005) and implement digital strategies to encourage various ways of accessing content (Daniel & Bird, 2019). Prensky (2005) also noted that integrating student feedback into the redesign of the teaching environment is critical to enhancing student learning experience. This opens the discussion on the level of educators' digital competences and whether they are prepared to take into account the needs of the learners.

Beckmann (2020) is convinced that digitization enriches, simplifies, and expands our experience in countless ways and that there is a rich variety of digital tools, ranging from the subject-specific to the more general in nature, available for university teaching. Higher educators should be aware of their options and be able to critically assess whether a digital tool really adds value – and if so, when and how? A key component within this process is acceptance on the part of students, meaning that educators need to find out if their students are willing to use digital tools and later if they actually use the tools provided during the course

(Beckmann, 2020). This again raises the question of whether higher educators are prepared and digitally competent to facilitate the needs of the students within the specific discipline.

*The overview drawn from the research literature shows that students ascribe benefits to face-to-face sessions and e-learning resources alike, with academic analysis also pointing to the advantages of a suitable mixed approach featuring digital and non-digital teaching elements. However, the findings detailed in the research literature additionally demonstrate that students frequently offer differing opinions on digital tools and that a given tool may receive a variety of positive and negative assessments. It is also apparent that there are differences inspired by the various disciplines or by individual learning behaviour (Beckmann, 2020, p. 381).*

Based on the previous, we should aim to broaden notions of the digital humanities beyond academic scholarship and publication and to include digital approaches to teaching, learning, and pedagogies (Brier, 2012) while being aware that the field of digital humanities requires both openness to experimentation and critical rigor.

Leigh Bonds (2014) wrote that teaching in the digital humanities field should emphasise that computing is not simply a set of techniques to achieve a pre-determined set of results but a set of humanities questions to achieve a set of challenging interpretations. According to Bellamy digital resources and tools are made available to students through "*a series of choices by their creators, educators, and administrators, and making student aware of these choices is vital for facilitating active and critical engagement with them*" (Bellamy, 2012, p. 6). Furthermore, Leigh Bonds is convinced that the critical thinking fostered by working with digital tools and techniques complements traditional humanistic inquiry and that integrating DH methodology into humanities programs and curricula augments traditional learning outcomes (Leigh Bonds, 2014).

Example: "Virtual visualization-digital humanities" blending theory

*Zhang et al. (2019) discuss digital and virtualized teaching methods in the teaching process of urban and rural planning. They describe a "virtual visualization-digital humanities" blending theory that closely combines urban and rural planning teaching. A preliminary virtual visual teaching framework and method for humanities is established and applied to a course of urban and rural settlement planning, with spatial elements as the link. They confirm this theory and method is conducive to improving the quality of student outcomes as for example engineering students can develop a more comprehensive humanistic perception of urban and rural space, and build a more comprehensive and perceptual planning concepts.*

Ideally, a range of issues involved in the design, creation, management and use of electronic resources in the humanities should be introduced to students (e.g. humanities resources on the Web, creating electronic resources, digital imaging, metadata systems, encoding and markup systems, electronic dictionaries, text analysis, scholarly electronic publishing in the humanities). Therefore, university teachers should be familiarized with the computing technologies and applications that are used in humanities research and teaching while understanding the areas where access, manipulation and analysis of digital resources can benefit research and teaching in the humanities.

*For new technologies to be used in an effective, efficient and trustful way in teaching and learning in higher education, certain framework conditions need to be met. New technologies need resources, infrastructure and human resources to use them. They equally need to be integrated into curricula, while learning outcomes acquired through using new tools need to be assessed and trusted at national level and abroad. Action required for the implementation of these changes needs long-term strategic planning, changes in the legal environment and financial resource allocation (The European Higher Education Area, 2018).*

#### **1.4.1 Digital competences**

As written in *White Paper Bologna Digital 2020* (Rampelt et al., 2020, p. 14), "people need to attain competency in using, working with and understanding digitalisation (devices, processes, information flows and data security)." In most recent studies, the types of skills required by a person are clustered around assumptions on how they will apply them in the future (cf. Working Group on Education, 2017). Three such sets of skills are the following (Rampelt et al., 2020, p. 14):

- "Basic functional digital skills, i.e. being able to use digital devices effectively as a medium for simple information retrieval and modification, including having sufficient knowledge of privacy and security issues.
- Generic digital skills, i.e. harnessing digital devices to use, interpret and create numeric and literary information sources for communication and collaboration with others.
- Using digital technology in empowering and transformative ways, i.e. manipulating how a device works (e.g. especially through coding) and what type of operations it can perform."

*The ubiquity of information, the quick access to data is valuable and terribly important for research work, but it turns out that it can be counterproductive to study, because the feeling that everything is always at hand, that all data can be checked at any time, gives the wrong impression that we also remembered relatively many of them. For many years, experts have been ringing the bell: the brain, the most adaptable organ, has begun to adapt 'rationally' and no longer uses its capacity for memory function. Without this, the basic building blocks of study are lost, by no means not only knowledge of certain things, but in the long run also the ability to judge and think critically (if I do not have enough data in my head at any moment to compare, judge and critically evaluate information or questions, then of course, my thinking is rather flat and fluffy; in extreme consequence it can also be completely wrong).*

*Participant's personal opinion; HUM@N study 2020*

In the HUM@N project, the study of the competencies of higher education educators and researchers was primarily based on two documents, namely *Digital Competence Framework for Educators: DigCompEdu* and *The Digital Competence Framework for Citizens*, which are briefly presented below. We also relied on documents dealing with digitalisation and digital education, such as *Bologna Digital 2020 - White Paper on Digitalisation in the European Higher Education Area* and *Digital Education Action Plan 2021–2027*. We tried to interpret all the information through the prism of digital humanities.

As written in the *Digital Competence Framework for Educators: DigCompEdu* (Redecker, 2017) published by the European Commission Joint Research Centre, educators require an increasingly broad and more sophisticated set of digital competences. In particular, the ubiquity of digital devices and the duty to facilitate the students in developing their digital competences requires educators to develop their own digital competence. Therefore, DigCompEdu responds to the growing awareness among many European Member States that educators need a set of digital competences specific to their profession in order to be able to seize the potential of digital technologies for enhancing and innovating education (Redecker, 2017).

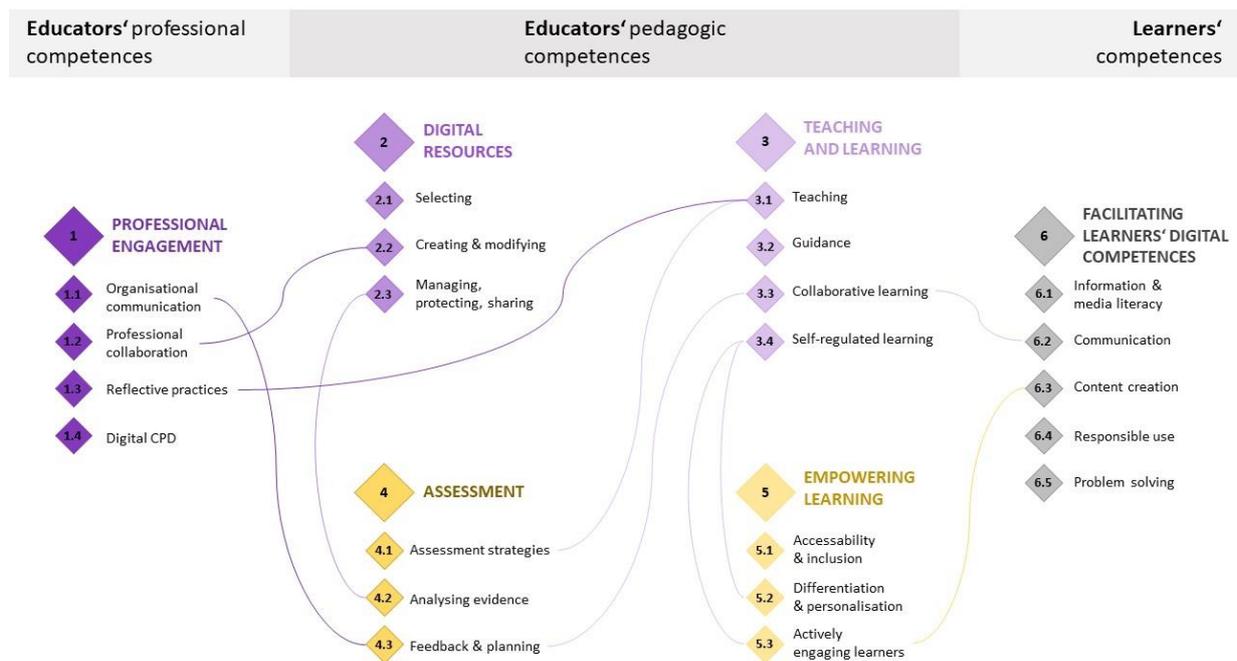


Figure 4. DigCompEdu competences and their connections (Redecker, 2017, p. 16)

Areas 2–5 define the core of the DigCompEdu framework. Together these areas explain educators' digital pedagogic competence, i.e. the digital competences educators need to foster efficient, inclusive and innovative teaching and learning strategies. Areas 1, 2 and 3 are anchored as the characteristics of any teaching process, whether supported by technologies or not. The competences listed in these areas detail how to make efficient and innovative use of digital technologies when planning (Area 2), implementing (Area 3) and assessing (Area 4) teaching and learning. Area 5 acknowledges the potential of digital technologies for learner-centred teaching and learning strategies. This area is transversal to Areas 2, 3 and 4 in the sense that it contains a set of guiding principles relevant for and complementary to the competences specified in these areas. Competence area 1 looks into how educators' professional digital competences are at root of their digital competence development. Area 6 details the specific pedagogic competences required to facilitate students' digital competence (Redecker, 2017, p. 16–17).

The DigCompEdu Framework also proposes a progression model to help educators assess and develop their digital competence. It outlines six different stages through which an educator's digital competence typically develops, so as to help educators identify and decide on the specific steps to take to boost their competence at the stage they are currently at.

Table 1. DigCompEdu competence level descriptions (Redecker, 2017, p. 35)

Level	Description
<b>Newcomer</b>	I am aware of the potential of digital technologies in pedagogical and professional practice.
<b>Explorer</b>	I am aware and interested in exploring the potential of digital technologies in pedagogical and professional practice.
<b>Integrator</b>	I experiment with digital technologies in a variety of context and range of purposes.
<b>Expert</b>	I use a variety of digital technologies confidently, creatively and critically to enhance my professional activities.
<b>Leader</b>	I use digital technologies consistently and comprehensively in my pedagogical and professional practices.
<b>Pioneer</b>	I use digital technologies in every aspect of my pedagogical and professional practice and question the adequacy of the contemporary digital and pedagogical practices.

*The European Digital Competence Framework for Citizens (2016)*, also known as *DigComp*, which was developed by the JRC as a research and development project with intensive consultation of stakeholders, offers a tool to improve citizens' digital competence. First published in 2013, it has become a reference for the development and strategic planning of digital competence initiatives at both European and Member State level. In June 2016, JRC published *DigComp 2.0*, updating the terminology and conceptual model, as well as showcasing examples of its implementation at the European, national and regional level.

Regarding the competences, the importance of their assessment also needs to be mentioned for the purpose of assessment is to gather relevant information about student or educator performance or progress. In 2010 Cartelli presented a new model for the framework of digital competence assessment which was based on the cognitive, affective and socio-relational dimensions. The main elements governing the assessment are the Bloom categories (e.g. remember, understand, apply, analyse, evaluate and create) while verbal-linguistic and logical-mathematical competences, deduced by the corresponding Gardner intelligences (Gardner, 1993), were seen as special sections in the dimension. They are very important together with technological competences when people use digital equipment for the construction of new knowledge, the creation of media expressions, and communication with others, in the context of specific life situations. In the affective dimension, the Krathwohl taxonomy (Krathwohl et al., 1973) was adopted (receiving phenomena, responding to phenomena, evaluating, organizing and internalizing phenomena). At last, the socio-relational dimension has been introduced to assess human and social interactions and relations (Cartelli, 2010).

In *DigComp* eight proficiency levels for each competence have been defined through learning outcomes (using action verbs, following Bloom's taxonomy) and inspired by the structure and vocabulary of the European Qualification Framework (EQF). Moreover, each level description

contains knowledge, skills and attitudes, described in one single descriptor for each level of each competence. Each level represents a step up in citizens' acquisition of the competence according to its cognitive challenge, the complexity of the tasks they can handle and their autonomy in completing the task.

Table 2. Main keywords that feature the proficiency levels (constructed on the basis of the DigComp 2.1 handbook (Carretero et al., 2017))

	1	2	3	4	5	6	7	8
	Foundation	Foundation	Intermediate	Intermediate	Advanced	Advanced	High specialised	High specialised
Complexity	Simple tasks	Simple tasks	Well-defined and routine tasks, and straightforward problems	Tasks, and well-defined and non-routine problems	Different tasks and problems	Most appropriate tasks	Resolve complex problems with limited solutions	Resolve complex problems with many interacting factors
Autonomy	Without guidance	Autonomy and with guidance where needed	On my own	Independent and according to my needs	Guiding others	Able to adapt to others in a complex context	Integrate to contribute to the professional practice and to	Propose new ideas and processes to the field
Cognitive domain	Remembering	Remembering	Understanding	Understanding	Applying	Evaluating	Creating	Creating

Essentially, the framework identifies 21 competences in five key areas, describing what it means to be digitally savvy. People need to have competences in each of these areas in order to achieve goals related to work, employability, learning, leisure and participation in society.

Table 3. The Digital Competence Framework for Citizens (source: Carretero et al., 2017)

The Digital Competence Framework for Citizens				
Competence area 1	Competence area 2	Competence area 3	Competence area 4	Competence area 5
<b>Information and data literacy</b>	<b>Communication and collaboration</b>	<b>Digital content creation</b>	<b>Safety</b>	<b>Problem solving</b>
<p>Browsing, searching, and filtering data, information and digital content.</p> <p>Evaluating data, information and digital content.</p> <p>Managing data, information and digital content.</p>	<p>Interacting through digital technologies.</p> <p>Sharing through digital technologies.</p> <p>Engaging in citizenship through digital technologies.</p> <p>Collaborating through digital technologies.</p> <p>Netiquette.</p> <p>Managing digital identity.</p>	<p>Developing digital content.</p> <p>Integrating and re-elaborating digital content.</p> <p>Copyright and licences.</p> <p>Programming.</p>	<p>Protecting devices.</p> <p>Protecting personal data and privacy.</p> <p>Protecting health and well-being.</p> <p>Protecting the environment.</p>	<p>Solving technical problems.</p> <p>Identifying needs and technological responses.</p> <p>Creatively using digital technologies.</p> <p>Identifying digital competence gaps.</p>



Figure 5. Specific computer laboratories are an important tool for retrieving digital competencies (author: L. Rebernik, 2020).

## 1.5 ICT and research in the Humanities

Research in the humanities is frequently misunderstood. A common misconception about research is reinforced when we view it solely in terms of the discovery of things previously unknown (such as a new species or an archaeological artifact) rather than as a process that includes the reinterpretation or rediscovery of known artifacts (such as texts and other cultural products) from a critical or creative perspective to generate innovative art or new analyses (What is Humanities Research, 2020). Fundamental to the concept of research is precisely this creation of something new. In the humanities, this might consist of literary authorship, which creates new knowledge in the form of art, or scholarly research, which adds new knowledge by examining texts and other cultural artifacts in the pursuit of particular lines of scholarly inquiry.

Through decades, the conduct of research in all areas of the arts and humanities has been changing. The application of ICTs had effects on the approach how researchers had conducted their science research. Nowadays we should aim to encourage, support and enhance the use of ICT in the conduct of research, the development and use of digital research resources and tools, and the exploitation of ICT in disseminating and making available the results of research (What is Humanities Research, 2020).

Deshmukh (2015) said that ICT had effects on many facets of science research. She classified them into three categories that include: 1) ICT application in pre-data analysis, which refers to examples how ICTs are applied on activities of social science research before reaching the stage of data analysis; 2) ICT application in data analysis, which includes examples how ICTs are applied on activities during the stage of data analysis and 3) ICT application in post-data analysis, which refers to examples how ICTs are applied on activities of social science research after completing the stage of data analysis (see Table 4).

*Table 4. Three categories of ICT effects on science research (Deshmukh, 2015)*

<b>Period</b>	<b>ICT application</b>
<b>Pre-data analysis</b>	Article Availability, Thesis and Dissertation Availability, Literature Search, Content Search, Literature Tracking, Quantitative Data Collection Qualitative Data Collection, Big Data and Its Analytics.
<b>Data analysis</b>	Quantitative Data Analysis and Qualitative Data Analysis.
<b>Post-data analysis</b>	References and Bibliography Compilation, Article and Thesis /Dissertation's Discussion among Researchers, Supervisors, and Supervisees, during Viva Voce, Plagiarism Detection, and Journal Manuscripts Submission.

There are many positive things regarding using ICT in research (e.g. the use of ICT shortens the research duration, increases the research quality expectation, raises the number of academic articles published before promotion, etc.). ICT is a new norm and an essential enabler to increase the productivity of a researcher (Deshmukh, 2015). It is expected that ICT will further accelerate and multiply the overall body of knowledge in science research together with redesigning research work with effective use of information and communication technology, which should also lead to networking of experts and expansion of opportunities for them to collaborate, share and communicate.

In many ways, the emerging digital tools help humanities scholars to modify research methods to explore patterns and uncover the hidden messages of research data. Some commonly used methodologies employed in many DH projects are presented in Figure 6.

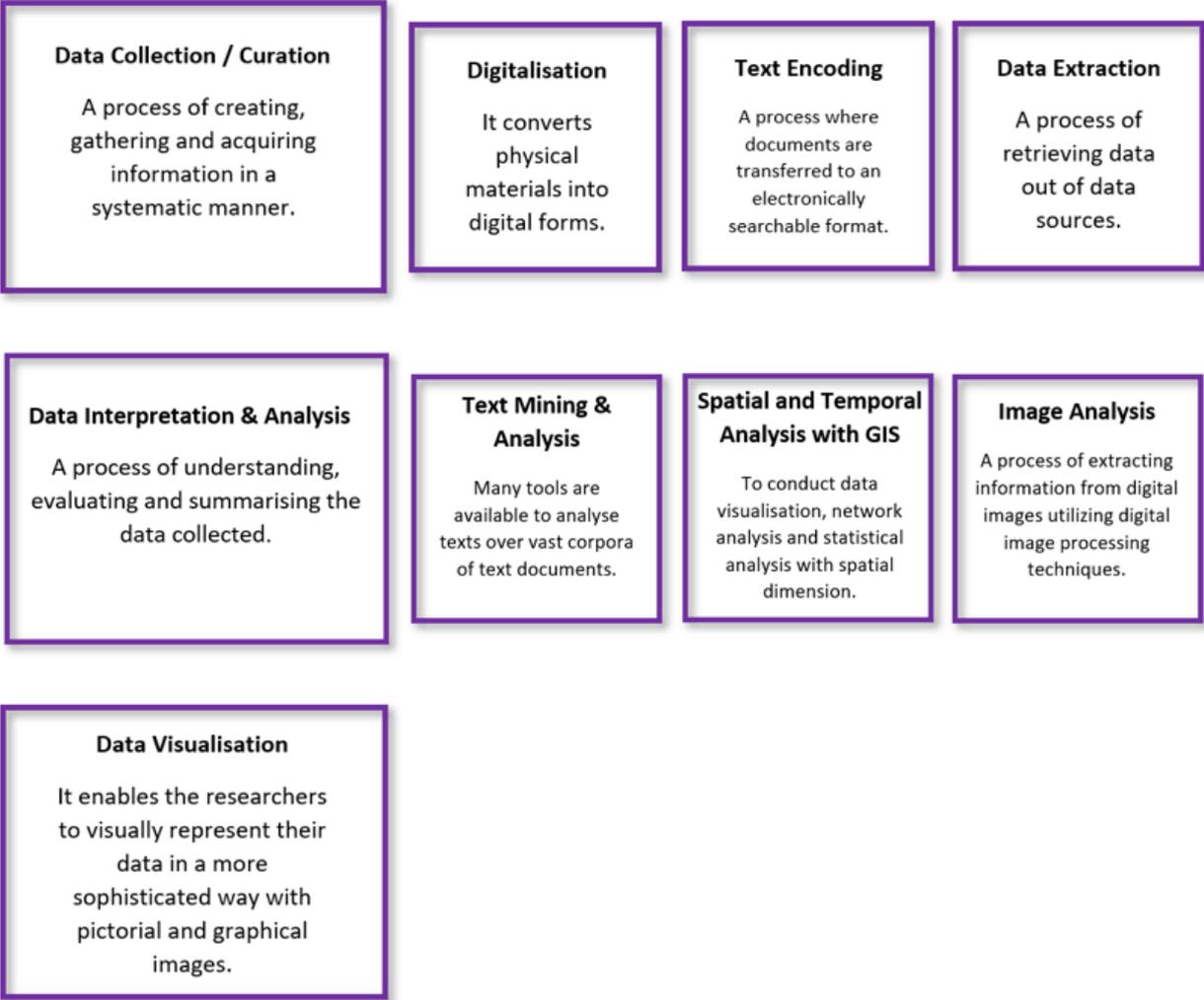


Figure 6. Some commonly used methodologies employed in many DH projects (Introduction to Digital Humanities ..., 2020)

A great advantage of visualization, if not the greatest, is the ability to present certain material in such a way that it encompasses a whole range of different interpretations. Views from multiple perspectives and different angles contribute to a completely new understanding. For the purposes of visualization, graphic, pictorial or some other form of presentation of cultural material, it is important to know the work in the field of computing and to penetrate the highest intellectual processes of the human mind. Understanding how the human brain perceives connections is generally the basis for high-quality presentation and manipulation of large collections of cultural and other material. Well-visualized material should encourage us to think in new ways to understand certain content (Digitalna humanistika, 2016).

*It is the time of the coronavirus – digital enables me to work, communicate and research remotely via the IT system and the library resources of my university. I hope that this crisis will leave us with a legacy of more remote working, which can minimise pointless commuting and increase confidence in staff to work without ‘presenteeism’. It may also enable new ways of working more effectively with international partners or at conferences - and in a way that is more environmentally friendly; however, I think there is still a place for face-to-face scholarly communication.*

*Participant’s personal opinion; HUM@N study 2020*

The combination of the methods of humanities and computing with the use of modern technologies has enabled great progress in the research, presentation and understanding of the various humanities. These are completely new forms that process large amounts of data.

In order to make productive and creative use of digital tools, it is necessary to develop digital literacy and attentiveness to the gaps between digital representation and reality. This implies that researchers should look at the translation of ideas and theoretical frameworks into computational systems and critically analyze how implemented computational mechanisms work (Priem & Fendler, 2019, p. 618). Therefore, a productive and critical transformation of knowledge in the digital age implies several changes in research practices. It means that “*new research*: (1) minds the gap between ideas and implementation; (2) addresses contradictions and insecurities; (3) remaps data according to new micro and macro scales; and (4) documents the messiness and experimental character of research by hyper- or paratextual layers that would also allow readers to follow and evaluate our trails as researchers in an ever moving ‘ocean’ of growing facts and information” (Priem & Fendler, 2019, p. 619).

Today several new commitments (e.g. reflection on the collaboration of humans and machines, maintenance of a critical focus on translation and implementation, and exploration of the imaginative horizon offered by digital tools) mark the difference between traditional understandings of rigor and discipline and computational experimentation (Priem & Fendler, 2019).



*Figure 7. A language laboratory presents a key space for foreign language learning where one can access different audio or audio-visual materials (author: L. Rebernik, 2020).*

Digitalisation is the best example of a modern way of protecting and preserving cultural treasures as a whole. However, there are disagreements about the impact of digitalisation, and one of the most common causes of conflict is insufficient understanding of the term itself. Traditionalists point out that everything is slowly turning into numbers, physical form becomes irrelevant, original documents (objects) lose their basic values and the 'aura' of originality. It is about the closure of traditional professions, about the fear that the work of librarians, archivists, museologists, etc. will be performed by a computer (Digitalna humanistika, 2016).

The proponents of digitalisation, on the other hand, oppose such attitudes and outline its benefits and importance for the functioning and development of society. They suggest that if cultural institutions want to survive and compete with the modern age, they should start digitizing various cultural materials as soon as possible. They stress that electronic form has a number of advantages, including the availability of information at any time throughout the world. The process of transition from analog to digital form is carried out with the utmost care, so that the digitized object retains all possible characteristics and values of the original content (Digitalna humanistika, 2016). Digitalisation may not be the perfect solution for the preservation and protection of cultural heritage, but its advantages far outweigh its disadvantages. Original objects retain most of their values, and jobs in the field of librarianship, archiving, museology, etc. cannot be replaced. Technology is there to facilitate long processes of supplementing, organizing and classifying numerous materials and to make everything 'neat' and accessible. In conclusion, it can be said that digitalisation encourages cooperation between experts and volunteers, traditional and modern scientists and researchers (Digitalna humanistika, 2016).

## 2. DIGITAL TRANSFORMATION IN HUMANITIES: EMPIRICAL INSIGHTS

In *A Short Guide to the Digital Humanities* Burdick et al. (2012, p. 2) write that Digital Humanities “refers to new modes of scholarship and institutional units for collaborative, trans-disciplinary, and computationally engaged research, teaching, and publication. Digital Humanities is less a unified field than an array of convergent practices that explore a universe in which print is no longer the primary medium in which knowledge is produced and disseminated.”

What qualifies as Digital Humanities? Is this the mere use of digital tools for the purpose of research and communication in the humanities? Have digital artefacts, new media, or contemporary culture replaced physical artefacts, old media, or historical culture? What is the object of study of Digital Humanities? Which fields have played an important role in the development of Digital Humanities? Why do some of the most important areas of Digital Humanities research extend beyond the traditional core of the humanities and include quantitative methods from the social and natural sciences as well as techniques and modes of thinking from the arts?

In order to understand the current situation in the humanities, we examined two co-existing worlds: 1) the one that uses digital technology in the humanities (or related fields) in higher education and 2) the other that works on digital humanities, often not in higher education institutions, not even in the humanities. It is necessary to deal with both, as together they determine or profoundly influence digital transformation in the humanities. The study aimed to identify the current state and nature of ICT use (in terms of access, use and creation of resources and tools) and the extent of variation, if any, between subject domains. Similarly, we were interested in ICT-supported educational and research activities in the humanities, as these are also significantly interrelated.



Figure 8. Humanities students during a fieldwork that included the use of digital technologies (author: J. Stopar, 2020)

In designing the questionnaire, the guidelines for case studies and interviews, several EU documents and tools such as DigComp 2.1 (Carretero et al., 2017), DigiCompEdu (Redecker, 2017), E-readiness (Horrigan, 2016) were taken into account. However, the ultimate goal was not a descriptive or a comparative statistical analysis of the collected data, but illustrative information from higher education professionals working in the humanities about their use of ICT in their education or research work, their ICT-related needs, and their opinions about strengths, weaknesses, opportunities and threats of the digital transformation in the humanities. In the project, this information served as a basis for the development of this handbook, online materials and tools, and for informing, motivating and supporting the digital transformation of the humanities in a critical and fruitful way. We believe that the humanities professionals addressed, as well as their students, institutions and societies, can benefit from taking a thoughtful, unobtrusive and encouraging path towards digital humanities.

The collected data and information from the case studies and interviews were analysed using basic descriptive statistical techniques and qualitative interpretations, with the focus on providing some key insights into the use of ICT in humanities in the EU. Our main aim was to identify the main needs and problems in such activities and to find examples of good practices. By linking these findings with the opportunities offered by the 'movement' of the digital humanities and the ICT-related developments and experiences in other disciplines, we aim to motivate and guide those who are only mildly interested to start or those who already have experience to introduce appropriate improvements in their work.

Based on a general research involving all disciplines/faculties of the university (e.g. Radovan et al., 2018) we started the project with the following expectations:

- the use of ICT in humanities in general lags behind other disciplines;
- there are considerable differences in the use of ICT within the humanities;
- the argued reluctance to use of ICT in the humanities persists, especially in teaching;
- those who are more active in the use of ICT may feel critically excluded to varying degrees from the more traditional colleagues;
- institutional leaders in the humanities may be less active and supportive in introducing digital transformation into their work.

## **2.1 Profile of respondents**

The questionnaire was primarily addressed to higher education humanities educators and researchers from the project partner countries (Cyprus, Estonia, Italy, Romania, Slovenia, and Spain). Invitations via several national and international e-newsletters and websites attracted 256 respondents from almost all over the world, but mainly from EU countries. Although we planned and hoped for a larger number of participants, the Covid-19 situation had a strong

impact on the response of potential participants. Unless otherwise stated, the statistics refer to the answers of the EU respondents, although some individual opinions, ideas and problems are also taken from other respondents (noted accordingly in the text).

More than 70% of the respondents are higher education teachers/educators, including assistants; 17% are mainly researchers in the humanities; 12% belong to the category 'others'. The latter includes respondents with a different status such as doctoral students, secondary school teachers, young researchers, administrative staff, and/or those who are only remotely related to humanities, such as educators in information technology, social sciences, and even an expert providing ICT to persons with disabilities.

The gender structure of the respondents is well balanced (51% male, 46% female, 3% did not want to answer).

The age structure shows that 76% of the respondents are between 40 and 60 years old, rarely under 30 or over 60. Only 10% of the respondents use digital technologies in teaching or research for 4 years or less, which is actually equivalent to those who have worked in teaching or research for that long.

## **2.2 Perceptions of digital technology in humanities**

Defining humanities as an object of empirical research is a problem that is mainly due to very different practices. In this survey, the humanities were divided into five broad disciplinary categories, accompanied by the sixth, which allows participants from other, mainly interdisciplinary fields to join the target group: history, language and literature, art (both fine arts and performing arts), philosophy and religion, geography and others. In the latter category, more than half of the respondents belong to one or more of the disciplines listed above. The respondents are evenly distributed between all the above-mentioned categories.

The majority of respondents work at the universities, either at the departments of different disciplines in humanities (as defined above) or teaching humanities (mostly languages or arts) in a 'non-humanities' faculty/department. Some work in several universities, or in a university and in an institute, but only a few are freelancers.

One way to show the diversity of respondents is to look at their fields of work. They range from teaching/researching local electoral history, migrations, prehistory, topics of historical French literature such as troubadours, Victorian literature and culture, languages, linguistics, language policy, communication skills, psycholinguistics, medieval art, teaching music instruments, musicology, drawing and illustration, visual information, sculpturing, creative artistic practices, film and media studies, general aesthetics, industrial design, philosophy of cognitive sciences, logic, argumentation, epistemology, metaphysics, narrations, beliefs and performances in folklore and religion, theology, law, from 'traditional' physical, human, regional geography topics to applicative, cultural or sense-of-place studies, to some of the

more explicitly ICT-related fields like cultural technologies, modern educational technologies, computation stylistics, contrastive linguistics, (geo)informatics, statistics, text analyses (also antiquity texts), machine learning, big data analyses, and digital humanities.

The vast majority of the respondents use the internet extensively and competently (93%), find it easy to work with computers and other technical equipment (85%). They are open and curious about new applications, programs, resources (79%), while a surprisingly low percentage report on their membership in various social networks (64%).

*Using digital technology sometimes means taking risks.*

*Participant's personal opinion; HUM@N study 2020*

## 2.3 Digital competences

Digital competence is the most recent concept describing technology-related skills. During the recent years, several terms have been used to describe the skills and competence of using digital technologies, such as ICT skills, technology skills, information technology skills, 21<sup>st</sup> century skills, information literacy, digital literacy, and digital skills. These terms are also often used as synonyms; e.g. digital competence and digital literacy (Ilomäki, Kantosalo & Lakkala, 2011).

The respondents self-assessed the degree of 'intensity' of their professional use of the ICT (Table 5), the ICT-proficiency in their work (Table 6) and the level of ICT competences (Table 7).

Almost half of the respondents use ICT intensively in their work; in addition, more than a third are moderate ICT users, while more than 15% use it only occasionally or not at all.

*Table 5. 'Intensity' of the use of ICT in respondents' work*

<b>Do you use digital technology (ICT) in your teaching or research?</b>	<b>% of respondents</b>
I do not use ICT in my work.	4
I could do without ICT in my work, but I use it occasionally.	6
I cannot do without using ICT in my work, but I use it only occasionally.	6
I am a moderate user of ICT in my work, but I use it sometimes or often.	35
I intensively use ICT in my work, most of the time.	48

The ICT proficiency levels in teaching and research (Table 6) are fairly well distributed among the participants. Slightly higher proficiency levels occur in relation to research work. The authors of the handbook consider the proficiency heterogeneity of the respondents (although it is based on a subjective self-assessment) to be valuable, as it ensures that the collected responses relate to very diverse ICT situations within the humanities. The lowest two levels (1 and 2 of 8) are reported by 21% of respondents regarding their teaching and 20% regarding their research work. The two highest levels (7 and 8 of 8) are given by 25% of respondents regarding their teaching and 24 % regarding their research work.

*Table 6. ICT proficiency levels in terms of respondents' teaching and research*

<b>Assessment of personal ICT proficiency level in terms of teaching and research (separately) by expressing the closest of the offered possibilities</b>	<b>Digital technology proficiency in teaching (% of respondents)</b>	<b>Digital technology proficiency in research (% of respondents)</b>
1. Simple tasks and guidance	4	5
2. Simple tasks and autonomy, with guidance if needed	15	13
3. Well-defined and routine tasks, straightforward problems and on my own	10	12
4. Well-defined and non-routine problems and independent, according to my needs	16	15
5. Various tasks and problems and guiding others	16	15
6. Most suitable tasks and able to adapt to others in a complex context	16	12
7. Resolve complex problems with limited solutions and integrate to contribute to the professional practice and to guide others	12	15
8. Resolve complex problems with many interacting factors and propose new ideas and processes in the field	10	14

*What is crucially missing in online teaching (e.g. via a video conferencing platform such as Zoom) is a sense of community, of closeness to others (a strong impression that this is even more true for students), which I think allows for deeper discussion, understanding and self-reflection.*

*Participant's personal opinion; HUM@N study 2020*

The prevailing levels of digital competences (Table 7) are *B1 Integrators* (28%), *A2 Explorers* (27%) and *B2 Experts* (21%). The *A0 (non-experienced)* and *A1 Newcomers* are over 30 in all age groups and represent 6% of all respondents. The *C1 Leaders* and *C2 Pioneers*, the highest digital competences levels, are also well distributed across the age groups over 30 and are self-assessed by 18% of all respondents.

*Table 7. ICT digital competences in respondents' work*

<b>How do you currently assess your digital competence?</b>	<b>% of respondents</b>
A0: Not interested, or interested, but have not tried yet	1
A1: Newcomer	5
A2: Explorer	27
B1: Integrator	28
B2: Expert	21
C1: Leader	13
C2: Pioneer	5

*It's impossible not to use ICT in teaching and research these days.*

*Participant's personal opinion; HUM@N study 2020*

The differences between respondents from different disciplines may indicate some specificities, such as 1) the highest level of intensive use of the ICT in their work is found in history and the lowest in philosophy and religion and 2) much higher levels of ICT proficiency in teaching and research expressed the respondents from geography and history, while the lowest levels were expressed in philosophy and religion.

*The acquisition of ICT skills is a life-long process. I just learned how to use the Zoom screen sharing and how to schedule a Zoom meeting at the very beginning of the Covid-19 crisis (I used Skype before and was only passive user of Zoom (attending meetings not organizing them – I was not able to schedule a meeting myself), just like many other humanities scholars. But when there is a need, one learns.*

*Participant's personal opinion; HUM@N study 2020*

## 2.4 Professional engagement competences

Professional engagement competences encompass individual's ability to use digital technologies for 1) professional interactions with colleagues, students and other interested parties, 2) individual professional development and 3) the collective good and continuous innovation in an organisation and teaching profession.

*ICT is just a tool.*

*Participant's personal opinion; HUM@N study 2020*

While the vast majority of the respondents systematically use different digital channels to enhance communication with colleagues and students (82%), to collaborate with colleagues inside and outside their educational organisation (81%) and actively develop their digital teaching and research skills (75%), the proportion of respondents who create and use their digital identity efficiently in professional communication is significantly lower (55%).



Figure 9. Specific needs related to digital technology that respondents consider necessary to improve

Although many ICT-related needs are common to respondents, they also pointed to some discipline-specific needs, such as:

- Geography-related needs: applying different parts of SPSS in research; using new geographical instruments and specific tools in research (e.g. data processing software— IRAMUTEQ, SONAL, ALCESTE etc.); working with big data, new data sources (like LIDAR) and new technologies; being able to evaluate online resources and tools for choosing the best in particular research or educational situation; developing basic skills in computer programming.
- History-related needs: further study and practice in programming languages (like R); learning and using geographic information systems (although usage of GIS is not a priority in their field of work); using different/new tools to work with data, media (e.g. video) and to communicate.
- Language and literature related needs: developing better programming skills.
- Arts (both fine arts and performing arts) related needs: online sources and tools for photo and video production and editing; for a musical instrument teacher the access to various software that can read musical notation and convert it into sound (so called smart-accompaniment, which can follow the instrumentalist even at the speed of playing); ability to create and maintain servers and websites (WordPress, MediaWiki).
- Philosophy-related needs: using cloud applications; making video lectures.

## 2.5 Digital Resources

The ability to work with digital resources includes 1) the identification of high-quality educational resources; 2) knowledge and skills for modifying, creating and sharing digital resources that fit teaching, learning and research objectives and activities; 3) responsible use and management of digital content (e.g. compliance with copyright regulations and protection of personal data).

The vast majority of respondents (89%) use different websites and search strategies to find and select a range of different digital resources, while a moderate majority of respondents (71%) effectively protect sensitive content (e.g. exams, students' grades, personal data, research data with limited access). 62% of respondents create their own digital resources and modify existing resources to suit their needs. 61% of them use digital technology to collect data through measurement, scanning, crowdsourcing and similar approaches. A minority (46%) agree that digital technologies can efficiently replace traditional learning and research environments and materials (e.g. libraries, document repositories).



Figure 10. Specific needs related to digital technology that respondents either have or wish to achieve in order to improve their work with digital educational or research resources.

With regard to teaching, respondents believe that 1) students need to be able to work flexibly in groups and also receive live feedback in class; 2) in times of pandemics, educators often ask students to learn (also interactively by using Zoom) to comment, observe, seek solutions for issues that have been shared on screen (e.g. PowerPoint, PDFs, video- and audio-recordings, etc.); 3) intelligent computer-based instructional sites are needed and 4) free and rapid access to knowledge through tutorial learning programs/integrated learning systems should be available to students.

Table 8. Needs of individual disciplines related to digital technology

DISCIPLINE	SPECIFIC NEEDS
Arts (both fine arts and performing arts)	Photo sources; digital image databases; digital libraries; online conferences; interest groups for searching and testing new ICT solutions
Philosophy	Using tools for encryption
Geography	Modelling of digital elevation models; LIDAR data; the latest geographical instruments; new techniques and methodologies; remote sensing; systematic archives of geographic data and tools; organised (e.g. institutional/national) system for archiving/free access; better knowledge of programming languages
Languages	Resources for improvement of written expression of students

One respondent emphasised that despite good access to digital resources needed for research and teaching, it is important to raise awareness and support their existence and their regular and critical use.



*Figure 11. Fieldwork research in the humanities requires good access to various digital resources (author: J. Stopar, 2020).*

## **2.6 Access and inclusion**

Rather lower are the assessment levels of the quality of their working environment. The majority state that 1) many of their colleagues use digital technologies in teaching and research (63%), 2) the faculty is adequately equipped with digital technology that they need in teaching (61%), 3) the faculty administration supports the integration of digital technologies in teaching and research (54%), 4) the faculty is adequately equipped with the digital technologies they need in research (54%), 5) the curriculum facilitates and supports the use of digital technologies in teaching and learning (53%) and 6) students have adequate access to digital technologies (devices, internet, digital labs, etc.) at the faculty (53%). Less than half respondents assess that students have adequate access to digital technology at home (44%). In order to use digital technology effectively in their teaching or research the majority of respondents have to finance their digital equipment at home (64%). Other ICT-related characteristics of the working environment that they consider important include 1) insufficient staff to provide ICT support (both for professionals and students), 2) copyright and licencing

issues for the digital tools and resources produced/used, 3) insufficient use of data management systems, 4) under-utilized opportunities for links between educational programs and even 5) problems with the access to the internet.

The rather reserved response to the invitations to fill in the questionnaire, to be contacted for an interview or to contribute a case study seems to show that the digital transformation of respondents' disciplines is not considered as an important issue, at least not as something our target group would be actively or passionately engaged with. Only about 10% of those invited directly (by e-mail) responded to the online questionnaire. Of those who responded to the questionnaire, only 15% were interested in being further interviewed, and the same proportion were interested in contributing a case study. Just over a fifth (22%) would participate in a one-day multiplier event in their country with practical application of ICT tools developed for use in the humanities (additional 39% would 'perhaps' participate in such a multiplier event). However, such interpretation of the poor response would be too narrow and simplistic. The project target group was addressed during the Covid-19 epidemics, in a time when ICT was a useful tool for collaboration, teaching and research even in times of the strictest lockdown. But on the other hand, it was the time of countless invitations to epidemics-related online questionnaires that overloaded professionals and students with ways of ICT-based communication and collaboration they had never experienced before.

### 2.7 Digital technologies in teaching, learning and research

With regard to digital technologies, teaching and research competences include designing, planning and implementing the use of digital technologies at different stages of the teaching/learning and research process.



Figure 12. Specific needs related to digital technology that respondents consider necessary to achieve the desired level and to improve their teaching or research or the learning of their students.

Table 9. How, when and why respondents use digital technology

The use of digital technologies (DT) - how, when and why	% of respondents
To ensure that DT are used in teaching with added value.	80
To ensure that DT are used in research with added value.	85
To succeed in blending digital technologies into respondents' teaching and research activities.	74
The students use digital technologies to acquire, document and present evidence.	72
To analyse or interpret data in respondents' research or teaching.	62
In visualisation (some including augmented/virtual reality) to present data, learn or solve problems in respondents' research or teaching.	50
To implement methods like descriptive, predictive, physical modelling or simulations in research or teaching.	44
To use cutting-edge technologies to work with big data in respondents' research or teaching.	30
To use coding/programming in respondents' research or teaching.	24

Table 10. Some of the ICT-related needs expressed by respondents from individual disciplines

DISCIPLINE	SPECIFIC NEEDS
Arts (both fine arts and performing arts)	Music 21, R, Sketch Engine
Philosophy and religion	Data visualisation and interpretation tools
Geography	Good computer and digital screen for teaching; need to learn programming language – especially programming in the field of mobile GIS; coding / scripting, big data analyses; modelling digital elevation models, LIDAR data
History	Training in data modelling and visualisation – above all in geospatial mapping

One respondent stressed that in the field of languages and literature he would prefer his students to read more paper books.

### 2.7.1 Assessment of Learning Progress

The aim of the assessment of learning process is the improvement of existing assessment strategies, the application of new and better assessment methods, the analysis of (digital) data available through the (inter-) actions of individual students, and the provision of more targeted feedback and support.

The majority of respondents use digital technologies to provide regular and effective feedback (67%), and less than half use digital assessment formats to monitor student progress (48%) and analyse all available data to identify students who need timely additional support (39%).

*Our university offers many workshops on the use of ICT in teaching. I do not attend them because I believe that I can learn the ICT I need for my work myself (admittedly, although I use ICT constantly during the corona times, I am not a big fan of it, as I prefer a more personal contact in physical space). What I would like to see instead of new ICT is that more money would be spent on equipping classrooms so that they can be more easily redesigned for various seminar work.*

*Participant's personal opinion; HUM@N study 2020*

Further research on the use of ICT in teaching and learning activities shows that the majority of respondents address potential digital problems when:

- creating digital assignments for students (e.g. equal access to digital devices and resources; interoperability and conversion problems; lack of digital skills) (65%);
- teaching students to assess the reliability of information and recognize misinformation and bias (62%);
- encouraging students to use digital technologies creatively to solve concrete problems (e.g. to overcome obstacles or challenges that arise in the learning process) (61%);
- using digital technologies to enable students to participate actively in a class (61%);
- creating assignments that require students to create digital content (e.g. videos, audios, photos, digital presentations, blogs, wikis) (57%);
- setting up assignments that require students to use digital means to communicate and collaborate with each other or with an external audience (52%).

Less than half teach students how to behave safely and responsibly online (49%) and use digital technologies to provide students with personalised learning opportunities (e.g. to give different students different digital tasks to address individual learning needs, preferences and interests) (42%).

Some respondents also use the possibilities offered by Moodle classrooms to evaluate students' work, perform online grading and cross-comparison of progress and prepare for

exam assessment. One respondent would welcome a database of key information rather than creating it himself.

Regarding ICT-supported education respondents made comments, such as:

- I need to be able to track student engagement more accurately.
- We are currently advised to use Redmenta for assessment; as there are many other tools available, I think we could all benefit from learning more about them.
- Digital technologies need to be more actively integrated into the teaching and learning environment at many universities.
- In large classrooms, it is difficult to monitor students who might be struggling; so I would need more ICT support to contact or help them.
- In 'corona times' many used online quizzes (Moodle or other) instead of written exams for the first time. I think that some scepticism is healthy – not only regarding the cheating, but also regarding the equality of the students' working environments (e.g. reliability of the internet connection and the like).
- We need to use ICT tools in teaching to give students the opportunity to assess their own learning or get feedback from the teacher.
- In Arts (both fine arts and performing arts) LOLA (low latency audio-visual streaming system) offers the best connection between two musicians who are far away from each other.



*Figure 13. Virtual piano lesson (author: T. Resnik Planinc, 2020)*



Figure 14. Specific needs related to digital technology that respondents consider necessary to achieve the desired level and to improve, empower and facilitate the digital competences of their students.

## 2.8 Strengths, Weaknesses, Opportunities, and Threats of the use of digital technologies in teaching and research (SWOT Analysis)

A SWOT analysis was carried out to obtain an overview of the opinions of university teachers and academics on the use of ICT in teaching and research in the humanities. As expected, opinions vary considerably, not only because of the subjectivity of the responses, but also because of the objectivity with which respondents are confronted in their work environments, which reflects the diversity of disciplines. The results are presented here in the form of word clouds and text that highlight the most significant responses.

*Weaknesses are also opportunities.*

*Participant's personal opinion; HUM@N study 2020*

In History, digital technologies enable historians to analyse larger amounts of material, especially databases; enable faster text analysis and text search, which means a more efficient path to results; enable all to participate in historical research. However, not all primary material is online and there is an assumption when working with historical collections that 'everything is digitised' and available on Google, but this is not the case. The digital bias creates an over-reliance on and disproportionate weighting for digitised material at the expense of undigitized, which could lead to false positives in data and research.

In Arts (both fine arts and performing arts), big data analysis is already important (in music-related research, even outside academia); students are much more aware of all the details when listening to their recordings (in comparison to traditional live exercises). However, they tend to work on live models, real material, etc. Digital technology cannot replace the mentor in teaching. There is potential for networking of galleries, authors and people involved in; there is the future of modernizing the teaching of art subjects, having so-called masterclasses – to teach and communicate with students from different parts of Europe or wider.

In Geography, it allows larger numbers of students to be challenged to solve real-world problems using real-world data by exposing them to advanced technologies for accomplishing tasks; it increases accessibility of a huge geographical data and information in shorter time; geographic information technologies allow us to know, interpret and think about space as never before possible. However, there is a risk of working exclusively in a virtual way, abandoning real fieldwork. Some phenomena and concepts are better explained visually by using technology; for instance, interactive maps are very useful.

In Philosophy, it is important to analyse things in detail, approach them critically, look for deeper meaning, etc., which is better achieved in dialogue. Immediate exchange of opinions can be best achieved in the classroom; teaching via digital technology cannot replace it. ICT gives an impression to students that they can learn quickly also those contents, which require a concentrated reading and practice. One respondent wrote “It is not very useful as a tool of research; I myself use it only in communication with colleagues, where ICT does help a lot.”

In Language and Literature, using digital technology is ‘a must’. However, it leads to students chasing a myriad of assignments, etc. instead of going through (regular) texts in a classical way; the negative consequences on cognitive capabilities of young minds have been already proven more than once.

*Strengths and weaknesses of using ICT in teaching and learning cannot be defined without considering how much a person is used to it. One can imagine that using a particular ICT for a long time or, from a very young age, strengths and weaknesses become something altogether different compared to the way I – reasonably experienced in using ICT but not really feeling ‘close’ to it – understand and feel about them.*

*Participant’s personal opinion; HUM@N study 2020*

## STRENGTHS

In general, respondents thought there were major strengths in the use of ICT in learning, teaching and research. Access to data and information, as well as to learning opportunities were the most frequently stated advantage. Saving time and being able to work collaboratively and more efficiently were noted.



They stressed, for example:

- ICT increases the accessibility of data and information that are potentially important in teaching, learning and research.
- Easily accessible, versatile support for data access, collection, exchange, analyses, presentations.

In delivering university education, access to resources and information, opportunities to personalize learning and opportunities for

## WEAKNESSES

There were many different weaknesses identified by respondents. Most of them related to technical issues and the time needed to keep up to date.

Some statements they quoted were:

- Ever-changing technical requirements (hardware and software).



- Focus on the digital processes rather than the actual content in humanities related themes.
- Enormous information noise both in research and in daily communication.
- Problems with technology, such as poor and slow access or synchronization of different software tools, etc.
- Infrastructure and own equipment, which is perceived as insufficient or technologically outdated.

communication and feedback were the most frequently mentioned, for example:

- ICT opens collaborative space for students and teachers, enables faster exchange of results and feedback.
- Distance and location do not matter; immediate communication allows interaction at a distance; it is safer and more direct.
- ICT allows sharing a lot of information and communication with students.
- Although it is time consuming, the possibility to provide personalized feedback (e.g. on a writing assignment) is also appreciated by students, who thus feel that their work is thoroughly evaluated.
- ICT often encourages students to express their point of view.



Similar to above-mentioned issues were identified in delivering university courses, including the lack of skills and available training:

- Too much computer time, loss of authentic teacher-student contact.
- Personal contact still plays a role that cannot be replaced by technology.
- It is a challenge to ensure that all students can access, use and understand technologies.
- The initial phase can be time-consuming; for example, preparation of quizzes in the format of different applications, preparation of tests or teaching materials. Some students or teachers are not as good or willing to use technology.
- Less student participation in discussions (this might also come from the fact that most students did not have much experience with video conferencing).

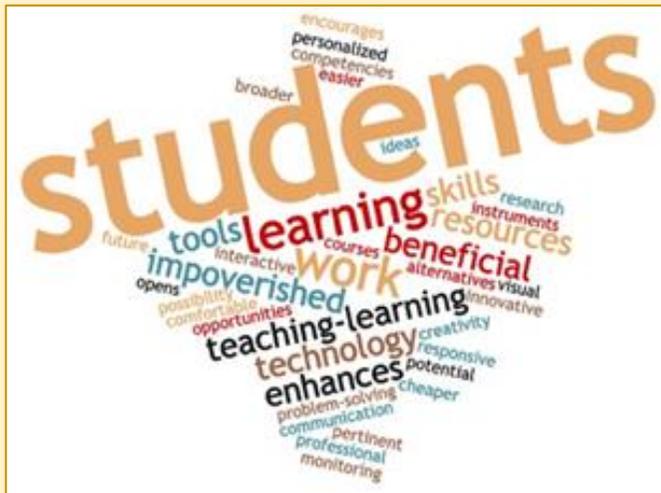




Learning new ways to do things is always beneficial, while the competences are useful also outside the teaching-learning environment.

In terms of university education, the focus was on the potential for students to benefit. They cited:

- ICT has potential to foster more interactive learning;
- ICT opens the space for creativity - when you do not define the tasks for students 100%, students might provide very innovative ideas;
- digital technology enhances the visual aspect of teaching/learning.



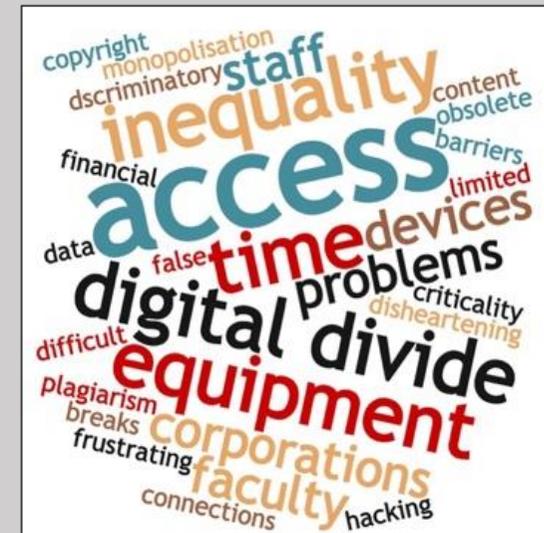
• too often a lack of interest in modern technologies, as individuals are content with a computer only as a replacement for a typewriter;

• quantification of 'science' that is not 'science' as generally understood, and should not be quantified as natural sciences;

• possible threats of using technologies without human participation.

In university education, there was concern over student access and inequalities that can result and worries about the commercialisation of education. For instance:

- problems with inequality of access to equipment can advantage some students over others because of location and finances;
- monopolisation of knowledge by corporations, publishers, a high price to access publishing, rigid copyrights on audio-visual material.



## 2.9 ICT related needs: a synthesis

The study presents the diversity of the respondents' needs related to digital technology in the humanities teaching and research. Several results correlate with expectations based on previous studies (such as the aforementioned study by Radovan et al., 2018). A fairly general reluctance to use digital technologies in some parts of the humanities is persistent, but often well argued, as shown by the statements of several respondents in the handbook. The reluctance is usually not absolute, but rather specific. The majority use digital technology in their work, but they may have healthy scepticism about its use in specific situations or for specific activities.

*At present, the use of ICT is often very similar to conventional teaching, making sure you are still in front of the camera. ICT tools offer a vastly richer learning experience than we are able to create.*

*Participant's personal opinion; HUM@N study 2020*

The general level of competences and practises in dealing with digital technology in the humanities is not low among the respondents in our study, but it differs considerably both between disciplines and between institutions and individuals. In these circumstances, raising awareness of the needs associated with digital technology among educators and researchers, as well as others who can contribute to improving the appropriate use of digital technologies in the humanities, is truly essential for improving existing practices or for initiating and supporting the introduction of new teaching and research practices where these promise better results.

Some of the needs presented in Table 11 may not yet be perceived by national institutions, institutional managers and even colleagues within faculties and departments. In addition to the more advanced actors in the digital humanities who want to improve their programming skills, create their own 'digital ecosystems' or similar, there are some professionals who need support to start using ICT in their work and to keep up with the digital transformation in the humanities. Indeed, many respondents articulated very basic needs, often reflecting a rather reserved attitude in the broader institutional or national environment towards digital technology in the humanities and consequently less attention to its inclusion in teaching and research.

*Requires training that few teachers have. Containment a good example of this – some teachers in my faculty did three-hour video conferences of lectures without imagining that distancing oneself from the course means changing the form and content of the course.*

*Participant's personal opinion; HUM@N study 2020*

Table 11. Examples of the needs related to digital technology in their work expressed by educators and researchers in humanities (e.g. by respondents in the questionnaires and interviews)

Fields of professional activities/competences	General or specific needs
<p><b>Access to digital technologies</b></p>	<p>Appropriate equipment, digital technology infrastructure, collaborative online environments at work and at home.</p> <p>Access to licences for the appropriate software, for educators, researchers and students. Freeware is not always the best solution.</p> <p>Using internet and online platforms for distance teaching and learning, project management, communication, etc. are a necessity for the future – corresponding necessities are also adequate technological equipment and skills.</p> <p>More active integration of digital technologies into the education and research environment in the humanities.</p> <p>Local/institutional support for the establishment and use of open source tools, programming languages, collaborative environments. Examples: tools for qualitative data analysis, python and R programming languages, collaborative tools such as Etherpad and Moodle, tools for creating and editing web sites, music, video, interactive presentations.</p>
<p><b>Professional Engagement</b></p> <p>Using digital technologies for professional interactions with colleagues, students and other interested parties, for individual professional development and for the collective good and continuous innovation in the organisation and the profession.</p>	<p>Motivation to acquire and improve personal digital skills.</p> <p>Support to for the acquisition of skills to create personal ‘digital ecosystems’ that can be used in research or teaching, with colleagues or with students.</p> <p>Achieving the ability of educators, researchers and students to work in groups in a flexible way.</p> <p>Using social networks follow new daily information and other tasks related to work or study.</p> <p>More opportunities to share ideas and resources, e.g. through networking, webinars, interactive websites.</p> <p>Achieve a certain level of standardisation in online education and research collaboration, at least at institutional level, if not at national level (e.g. using the same platform, ensuring that all students, teachers, researchers have access to the proposed technologies, adequate skills, etc.).</p>

	<p>Appropriate support for discipline-specific asynchronous and synchronous cooperation in teaching and research.</p> <p>Creation and maintenance of national/international professional websites, e-mail lists/services in the humanities.</p>
<p><b>Digital Resources</b></p> <p>Identifying good educational/research resources, modifying, creating and sharing digital resources that fit teaching, learning and research objectives and activities; responsibly using and managing digital content, respecting copyright rules and protecting personal data.</p>	<p>Better skills for efficient online searching for adequate information, creation and use of databases, working with big data, emerging data sources, new technologies.</p> <p>Ability to create and maintain servers and websites.</p> <p>Higher education institutions must provide permanent (and not just occasional) free access to digital resources (such as online literature, information/photo repositories, programming scripts, tools) that are essential for education and research, otherwise the digitisation of humanities cannot take place.</p> <p>Adequate ICT support (equipment, staff) and maintenance of copyrights and licences for the produced/used digital resources.</p> <p>In some disciplines, there is a lack of quality resources, even at a basic level such as requiring adequate scanning resolution of historic documents.</p> <p>Raising awareness of the existence of and access to digital resources needed for research and teaching in the humanities and motivating their regular and critical use.</p> <p>Systematic (e.g. institutional, national) system for archiving/accessing archives of data and tools (including scripts/programmes) relevant to education and research in the humanities. In particular, data at local/national level or results/databases from specific research often remain private.</p> <p>Free and quick access to knowledge (as a resource) through tutorial learning programmes/integrated learning systems.</p> <p>Standardised institutional support and provision of access to adequate skills to ensure a high level of digital security.</p>
<p><b>Digital technology in teaching, learning and research</b></p> <p>Designing, planning and implementing the use of digital technologies in</p>	<p>Need for improved personal/team digital skills, e.g. in terms of programming languages, blended teaching/learning, rapidly developing modern scientific/research and educational methods, methods and tools for advanced visual presentations of research findings.</p> <p>Access to systematically updated knowledge about the tools that really add value to teaching and research, and no pressure to use unevaluated tools just because they are modern.</p>

<p>different stages of the teaching/learning and research processes.</p>	<p>Adequate tools and instruments for retrieving, analysing, presenting data, documenting; for example, software with flawless speech to text capabilities (processing speed, correct interpretation and transcription of voice inputs); transcriptions of semi-structured interviews; for research and teaching in artistic and cultural practices; data modelling, interpretation and visualisation, photo, video production and editing tools for online sources; software for reading music notation and its conversion into sound; instruments for fieldwork measurements.</p> <p>Need for intelligent computer-assisted instruction (ICAI) / teaching and learning portals.</p> <p>Generalised programming literacy is important to integrate digital tools into teaching / learning / research as seamlessly as we integrate our natural languages (e.g. English) into these tasks. Programming languages like Python and r are free and powerful, a potential for development of students and professionals, regardless of discipline.</p> <p>As technology evolves, there is a need for additional training to keep up with changes in technology.</p> <p>An experienced mentor/advisor (with clear instruction on where to find this support) who will give an advice and support better use of available approaches/tools/methods. Self-learning is often not feasible under overburdening working/educational conditions.</p> <p>Online access to examples of good practice, evaluated online resources and tools to choose from in particular research or educational situations.</p> <p>Advice on how digital technologies can be used to provide personalized learning opportunities and teach students how to behave safely online.</p> <p>Students who are trained to become future teachers need to gain experience of how to use ICT as a teacher, and not just as a learner.</p> <p>Continuous provision of evidence, motivation and support to those who are reluctant to use ICT in higher education/research.</p>
<p><b>Assessment of Learning Progress</b></p> <p>Enhancing existing assessment strategies and</p>	<p>Educators need support in acquiring skills to use the functionalities of e-learning platforms for student work assessment, online grading and crosschecking of progress, online exams and their assessment.</p> <p>Access to information about and opportunity to try different assessment tools, self-assessment of students and personalised feedback to students.</p>

<p>giving rise to new and better assessment methods; analysing (digital) data available on individual student's (inter-)actions, offering more targeted feedback and support.</p>	<p>More artificial intelligence/automation /ICT embedded in e-learning environments is needed to support the learning of students who have difficulties, especially in large classrooms.</p> <p>Regular gathering of reliable or detailed information about students' digital competences and their needs in terms of development.</p> <p>Students often need additional training to become familiar with technologies; they are often very advanced in using mobile phones but have little understanding of computers or software.</p>
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### 3. GOOD PRACTICE EXAMPLES

#### 3.1 Chosen case studies

As part of the questionnaire, the results of which were presented in Chapter 2, we also invited the participating educators and researchers to further collaboration (interview/case study/participation in events organized by the project team).

As case study refers to the collection and presentation of detailed information about a particular participant or a small group, participants were asked to prepare their own example of how to integrate ICT in their teaching and research work. Authors were encouraged to follow a common format and to address the following points where applicable: requirements of the activity (e.g. digital technology and existing knowledge and skills); objectives; digital tools and key results.

Overall, we received 28 case studies covering a wide range of current or recent ICT-oriented approaches in the humanities. Eleven of them were included in this chapter, while others are available under the links section of Table 12.

Table 12. All received case studies and their short description

Author	Country	Field of humanities	Title and a short description of the case study	Where can the case study be found (handbook or online)
Athanasopoulou Afroditi	Cyprus	Languages and literature	<b>Online classroom during the pandemics</b> Virtual/Online teaching during Covid-19 outbreak through MS Teams Platform as indicated by the university rectorate.	ONLINE: <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/02_Online-classroom-during-the-pandemics.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/02_Online-classroom-during-the-pandemics.pdf</a>
Maria Pavlou	Cyprus	Language and literature	<b>Game-based learning with Kahoot!</b> Using Kahoot! as a game-based learning platform and to review students' knowledge, making the lessons much more attractive for the students.	ONLINE: <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/03_Game-based-learning-with-Kahoot.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/03_Game-based-learning-with-Kahoot.pdf</a>
Christofi Christakis	Cyprus	Language and	<b>Online teaching during the pandemics</b>	ONLINE: <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/05_Online-teaching-during-the-pandemics.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/05_Online-teaching-during-the-pandemics.pdf</a>

		literature, Arts	The Open University of Cyprus is based on distance learning, therefore ICT and telecommunication platforms are used extensively in combination with physical presence.	
Reda Alkot Mohamed	Egypt	Geography	<b>GIS in touristic marketing of historic Cairo, Egypt</b> Using ArcGIS Online in touristic marketing of historic Cairo (Egypt). This case study produces a web page to explore the map of touristic places and buildings, which is available to the wider audience from the entire world.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/22_GIS-in-touristic-management-of-historic-Cairo.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/22_GIS-in-touristic-management-of-historic-Cairo.pdf</a>
Eero Hyvönen	Finland	All humanities	<b>Helsinki centre for digital humanities</b> A Digital Humanities minor subject study block at the Faculty of Arts; to do this they run a Digital Humanities Research Seminar, and they produce multiple online learning materials.	<i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/11_Helsinki-centre-for-digital-humanities.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/11_Helsinki-centre-for-digital-humanities.pdf</a>
Manuel Burghardt	Germany	Other: Media Studies	<b>Media sentiment</b> Using NLP and text mining for automated analyses. As a part of the seminar, an introduction to the structure of dramas and films is given, combined with an overview of existing analysis approaches.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/12_Media-sentiment.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/12_Media-sentiment.pdf</a>
University San Raffaele Milano	Italy	Philosophy	<b>Wine and food philosophy</b> Giving online classes during the Covid-19 pandemics using MS Teams and Google Drive.	<i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/01_Food-and-wine-philosophy.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/01_Food-and-wine-philosophy.pdf</a>
Diana Popa	Romania	Arts	<b>ICT in film studies</b> The students learn about different digital tools which can be used for text writing and film making.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/19_ICT-in-film-studies.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/19_ICT-in-film-studies.pdf</a>
Radu Negru	Romania	Geography	<b>Geomorphological processes and elements</b> The presentation of geomorphological elements and processes, which constitutes the coastal system, using Google Earth Pro and YouTube.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/20_Geomorphological-processes-and-elements.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/20_Geomorphological-processes-and-elements.pdf</a>
Anisoara Pop	Romania	Other: English for Specific Purposes – English for	<b>Increased communication in English for specific purposes</b> Increased communication in English for nutrition studies was done with blog writing (using the tool BlogSpot) in order to extend students writing practice to professional topics.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/24_Increased-communication-in-English.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/24_Increased-communication-in-English.pdf</a>

		Nutrition and Dietetics		
Irma Potočnik Slavič and Nejc Bobovnik	Slovenia	Geography	<b>Collaborative mapping of amenities in rural areas</b> Collaborative mapping of amenities in rural areas – testing the usability of the mentioned hardware and software (ArcGIS Collector, GNSS) as part of the fieldwork in several phases.	<i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/25_Collaborative-mapping-of-amenities-in-rural-areas.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/25_Collaborative-mapping-of-amenities-in-rural-areas.pdf</a>
Žiga Zwitter	Slovenia	History	<b>Spatial data in history classes</b> Exposing students to different digitalised archives, methods and how to use historical spatial data.	<i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/26_Spatial-data-in-history-classes.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/26_Spatial-data-in-history-classes.pdf</a>
Blaž Repe	Slovenia	Geography	<b>Support for field work for geography students</b> Support for field work for geography students where students create their own story with online maps (ArcGIS Online).	<i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/27_Support-for-field-work-for-geography-students.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/27_Support-for-field-work-for-geography-students.pdf</a>
Darja Mertelj	Slovenia	Languages and literature	<b>ICT tools for practicing productive skills in foreign language teaching</b> Students do the audio recording of their foreseen parts of the lesson, and receive (oral, recorded) feedback, in order to improve it, if needed.	<i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/28 ICT-tools-for-practising-productive-skills-in-foreign-language-teaching.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/28 ICT-tools-for-practising-productive-skills-in-foreign-language-teaching.pdf</a>
Matej Zupan	Slovenia	Arts: Music	<b>Teaching/learning a musical instrument during the pandemics</b> Teaching/Learning a musical instrument during a pandemic used through Skype, WhatsApp, Viber, Zoom, FaceTime etc.	<i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/29_Teaching-musical-instrument-during-the-pandemics.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/29_Teaching-musical-instrument-during-the-pandemics.pdf</a>
Predrag Novaković	Slovenia	Other: Archaeology, Heritage Sciences	<b>Archaeological dialogues without isolation</b> Archaeological Dialogues without isolation threw open forum and dialogues during the pandemics. Dialogues were implemented in the framework of the HERISTEM project (Erasmus + project).	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/30_Archeaological-dialogues-without-isolation.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/30_Archeaological-dialogues-without-isolation.pdf</a>
María Luisa de Lázaro Torres and Francisco José Morales Yago	Spain	Geography	<b>Geography for secondary school teachers</b> The insight into the digital education tools that favour the learning of geography and promote digital teaching skills.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/07.1_Geography-for-secondary-teachers.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/07.1_Geography-for-secondary-teachers.pdf</a>
María Luisa de Lázaro Torres and Francisco	Spain	Geography	<b>National park management</b> Using ArcGIS Online in the issue of national park management.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/07.2_National-park-management.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/07.2_National-park-management.pdf</a>

José Morales Yago				
Miguel Santamaría Lancho, José María Luzón Encabo, Mauro Hernández Benítez and Guillermo De Jorge Botana	Spain	History	<b>Automatic evaluation of student work</b> Automatic evaluation of discursive texts. The system describes numerically the correctness and completeness of the information freely written by the student, while offering a value-score on the quality of the writing response. And finally, the system includes a detailed personalized feedback based on the important key ideas.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/09_Automatic-evaluation-of-student-work.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/09_Automatic-evaluation-of-student-work.pdf</a>
José Manuel Crespo Castellanos	Spain	Geography	<b>Forest fire investigation</b> Using Iberpix tool to analyse the causes and consequences of forest fires.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/15_Forest-fire-investigation.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/15_Forest-fire-investigation.pdf</a>
Teresa Mateo Girona	Spain	Languages and literature	<b>Construction of a space to tell short stories</b> Using blog in the class of Didactics of Spanish Language in order to create short literary texts to share fictional worlds that will help us to cope with the pandemics.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/16_Construction-of-space-to-tell-short-stories.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/16_Construction-of-space-to-tell-short-stories.pdf</a>
Carmen Mínguez García	Spain	Geography	<b>Urban routes in Madrid, Spain</b> Using GIS Story Maps in the tourism studies to design new, innovative and interesting routes in the city of Madrid.	<i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/17_Urban-routes-in-Madrid.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/17_Urban-routes-in-Madrid.pdf</a>
Vincent Gaffney	UK	Other: Archaeology	<b>Landscape archaeology and digital heritage</b> 3D methods of digitally documenting objects, sites, and landscapes. Digital data can be a way of archiving heritage and is becoming the gold standard for commercial recording of sites and landscapes.	<i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/06_Landscape-archaeology-and-digital-heritage.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/06_Landscape-archaeology-and-digital-heritage.pdf</a>
Lauren Cassell	UK	History	<b>Casebooks</b> Studying the medical records of the astrologers Simon Forman and Richard Napier. Using 80,000 astrological records written in archaic handwriting for teaching and research.	<i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/08_Casebooks.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/08_Casebooks.pdf</a>

Angelique Richardson	UK	Languages and literature	<p><b>Hardy's correspondents</b></p> <p>The University of Exeter has a lab and research space for the Digital Humanities. They are able to create digital facsimiles of the objects, allowing them to be handled and understood in a virtual space, protecting the original artefacts for future generations. Hardy's Correspondents is one of the projects carried out.</p>	<p><i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/10_Hardys-correspondents.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/10_Hardys-correspondents.pdf</a></p>
John Rink	UK	Arts: Music	<p><b>Online Chopin Variorum Edition</b></p> <p>Online Chopin Variorum Edition has exploited emerging technical capacities for text/image comparison as well as recent musicological advances. It is a database and high-resolution imagery; a toolkit allows annotation.</p>	<p><i>HANDBOOK:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/13_Online-Chopin-variorum-edition.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/13_Online-Chopin-variorum-edition.pdf</a></p>
Christos Lynteris	UK	History	<p><b>Visual representation of the third plague pandemics</b></p> <p>The project collects and analyses photographs as well as other visual documents of the third plague pandemic, which broke out in 1855 in Southwest China (Yunnan) and raged across the globe until 1959, causing the death of approximately 12 million people.</p>	<p><i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/14_Visual-representation-of-the-third-plague-pandemics.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/14_Visual-representation-of-the-third-plague-pandemics.pdf</a></p>
Steven Graves	USA	Geography	<p><b>The introduction of GIS in geography</b></p> <p>Simple introduction to ICT (e.g. GIS, different databases, cloud computing etc.) in geography studies.</p>	<p><i>ONLINE:</i> <a href="https://www.digihuman.eu/wp-content/uploads/2021/04/31_The-introduction-of-GIS-in-geography.pdf">https://www.digihuman.eu/wp-content/uploads/2021/04/31_The-introduction-of-GIS-in-geography.pdf</a></p>

## AUTHOR

Eero Hyvönen, Helsinki Centre for Digital Humanities HELDIG

## COUNTRY

Finland

## FIELD OF HUMANITIES

All humanities

## REQUIREMENTS FOR THIS ACTIVITY

### 1. Digital technology:

Moodle, series of tools for cleaning data (TAGS, Annif, etc.) and tools for visualising data (RAW, Voyager, Tableau, etc.).

### 2. Pre-existing knowledge and skills:

None.

# HELSINKI CENTRE FOR DIGITAL HUMANITIES

A Digital Humanities minor subject study block at the Faculty of Arts which currently involves a Digital Humanities Research Seminar. Multiple online learning materials are in active development.

## GOALS

A key mission of HELDIG is to establish a collaboration network between the Digital Humanities related fields in seven different faculties at the University of Helsinki. Beyond this, close collaboration with Aalto University and other organizations active in Digital Humanities in the Helsinki area is an essential part of the work at HELDIG, as well as collaboration with the international Digital Humanities community.

In its vision, the University of Helsinki and the Helsinki capital area constitute a leading international hub of Digital Humanities research, education, and application development. HELDIG is the facilitator of large-scale collaboration and infrastructures needed at the University of Helsinki (UH) and between other universities, research centres, memory organizations, public organizations, and companies.

## KEY OUTCOMES

HELDIG focuses its work on four strategic areas:

**Research.** Using and developing computational methods, tools, and services for research in humanities and social sciences. Studying aspects of digitalization as phenomena.

**Education.** Providing DH education and data infrastructure for students, researchers, and application developers.

**Infrastructures.** Support for digitizing, enriching, and publishing data and knowledge that is needed in DH research and is produced by it.

**Society.** Fostering the utilization of the research results in the society.

## ADDITIONAL INFORMATION

<https://www.helsinki.fi/en/helsinki-centre-for-digital-humanities>

## AUTHOR

University San Raffaele Milano

## COUNTRY

Italy

## FIELD OF HUMANITIES

Philosophy

## REQUIREMENTS FOR THIS ACTIVITY

### 1. Digital technology:

Microsoft Teams and Google Drive.

### 2. Pre-existing knowledge and skills:

Basic computer knowledge and skills related to Microsoft suite and Google Drive.

# WINE AND FOOD PHILOSOPHY

Before the Covid-19 all teaching activities took place in a classroom and with online assignments for students. This year the Master's programme started two weeks before the lockdown, so all the activities were organised online with the programme Microsoft Teams.

## GOALS

The goal of the teaching activity is to guide students through the main knowledge and skills related to food and wine communication. The objective is twofold: to provide in-depth skills in the subject and, alongside this, to master the use of tools for compelling Storytelling (a skill increasingly important to companies) which also includes communication strategies.

## USE OF DIGITAL TOOLS

The university has a full account on Microsoft Teams and at the beginning of the course, a room was created for the Master's programme and all students were invited to join. All the teachers were invited to connect through a link during the lessons that they had to deliver, as well as when they hosted experts, companies, externals, etc.

## KEY OUTCOMES

Online classroom activities work well when teachers and students have the same level of knowledge of the tool. At the beginning, neither the students nor the teachers were familiar with the technology, so we had to assign a tutor who facilitated the teaching activity, helping both the students and the teachers in case of technical problems.

Not all the teachers were ready to teach online. To be more effective, lessons should be well-structured, with presentations, time for discussion, collaboration tools, assignments, etc., otherwise students may easily lose attention.

Interaction works if both, students and teachers, have their camera on for most of the time. This caused some technical troubles because internet access fluctuated, but the tool was quite stable and allowed good video and audio performance.

## AUTHOR

Irma Potočnik Slavič and Nejc Bobovnik,  
University of Ljubljana

## COUNTRY

Slovenia

## FIELD OF HUMANITIES

Geography

## REQUIREMENTS FOR THIS ACTIVITY

### 1. Digital technology:

Computer, ArcGIS Collector, and smart phones.

### 2. Pre-existing knowledge and skills:

Familiarity with ArcGIS Collector, knowledge in priorities of rural development, and Local Development Strategy.

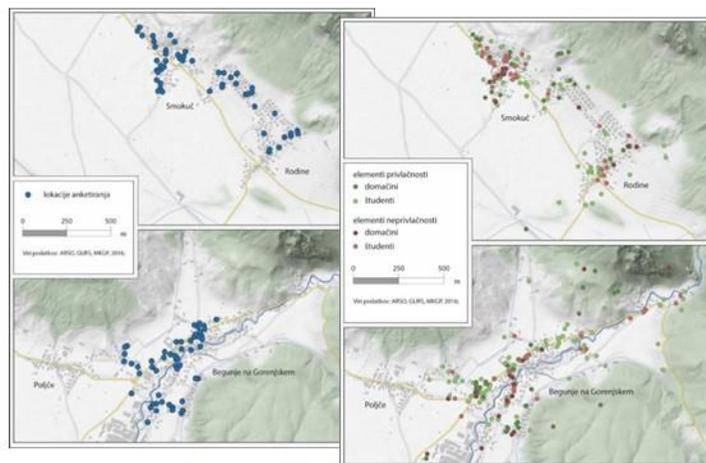
# COLLABORATIVE MAPPING OF AMENITIES IN RURAL AREAS

Collaborative mapping of amenities in rural areas – testing the usability of the mentioned hardware and software (ArcGIS Collector, GNSS) as part of the fieldwork in several phases.

## GOALS

The ArcGIS Collector application was used to perform field exercises, enabling field capture of points, lines and polygons via a mobile device. The application allows users to easily prepare a survey questionnaire, which contains the attributes (in our case these are (dis)amenities by categories and elements), while the location of the entry is obtained using GNSS (global navigation satellite systems) receiver in mobile phones.

Fig. 1. Survey locations in Dežela region (left) and Spatial distribution of (dis)amenity elements (right).



## KEY OUTCOMES

The introduction of the modern fieldwork techniques has many advantages that enable faster, more precise and more efficient data collection. Enabling students to use mobile technologies increases interest in fieldwork and requires less map reading skills, which on the other hand can also be considered as a negative. The problems we have encountered to date are mostly of a technical nature, since in narrow valleys and in sparsely populated areas there can be mobile connectivity issues, and consequently disruptions in entering data points. In other age groups, there may still be issues with smartphone uptake and use. The user interface and performance of the mobile applications could be improved, although updates are generally frequent with applications becoming more easy-to-use, whilst at the same time users are becoming more adept.

## AUTHOR

Žiga Zwitter,  
University of Ljubljana

## COUNTRY

Slovenia

## FIELD OF HUMANITIES

History

## REQUIREMENTS FOR THIS ACTIVITY

### 1. Digital technology:

Internet access.

### 2. Pre-existing knowledge and skills:

Specific knowledge in the field of history (History of South East Europe in Early Modern Times, Environmental History, etc.).

# SPATIAL DATA IN HISTORY CLASSES

Exposing students to digitalised archives of and methods for using historical spatial data.

## GOALS

The main goals include:

Students learn about e-access to some collections of digitised archival sources.

Students are able to use these digitised materials, applications, and data-bases in their research.

Students learn about contributions of reflected interdisciplinary approaches to more sophisticated analyses of historical data.

Students learn pros and cons of use of spatial data available with ICT (like LIDAR-based DEM, georeferenced historical maps) in comparison with historical field work.

Students integrate data available on listed links with their critical analyses of archival data (“historical critical method”).

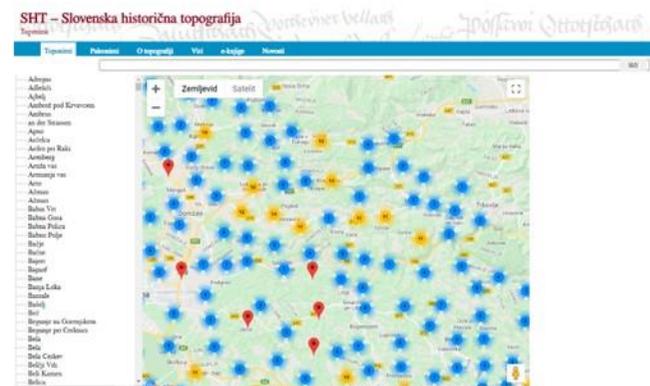
*Fig. 1. Sistory is an online system of Slovenian historiography.*



## KEY OUTCOMES

In the field of history, any sophisticated use of ICT is not a requisite for a successful hour of teaching, but it often helps understand the contents. Nonetheless, a basic use of ICT in terms of a power-point presentation is a must as it helps students to visualise the contents of the lecture – maps of historical political boundaries, economic history maps, photographs of historical artefacts etc. I combine presentations with the blackboard (I usually write all names and years to the blackboard to make the lecture more dynamic).

*Fig. 2. Students learn how to localize historical toponyms in medieval and early modern sources based on an approach integrating the palaeonymys given in Slovenska historična topografija.*



## AUTHOR

Blaž Repe,  
University of Ljubljana

## COUNTRY

Slovenia

## FIELD OF HUMANITIES

Geography

## REQUIREMENTS FOR THIS ACTIVITY

### 1. Digital technology:

Smart mobile device or a computer, internet access and the ability to capture locations (GNSS or GPS), access to the ArcGIS Online portal and to spatial databases.

### 2. Pre-existing knowledge and skills:

Knowledge of the basics of geoinformatics, desktop and web (ArcGIS Desktop and ArcGISOnline) GIS tools, databases, basic web page editing.

# SUPPORT FOR FIELD WORK FOR GEOGRAPHY STUDENTS

Support for field work for geography students where students create their own story with online maps (ArcGIS Online).

## GOALS

Students create their own story with maps online using digital spatial data, documents, hyperlinks, maps, photographs, videos, etc. On the one hand, they learn techniques and technologies, on the other hand, they have to creatively come up with the appropriate content and materials to make a story.

## OTHER EXAMPLES OF STUDENT WORK

<http://bit.ly/2R0kcCn>

<https://arcg.is/LnzLa>

<https://arcg.is/uS5va>

<https://arcg.is/nmqG9>

<https://arcg.is/ODOuWX>

Fig. 1. Student project: Mountain biking in Primorska region.

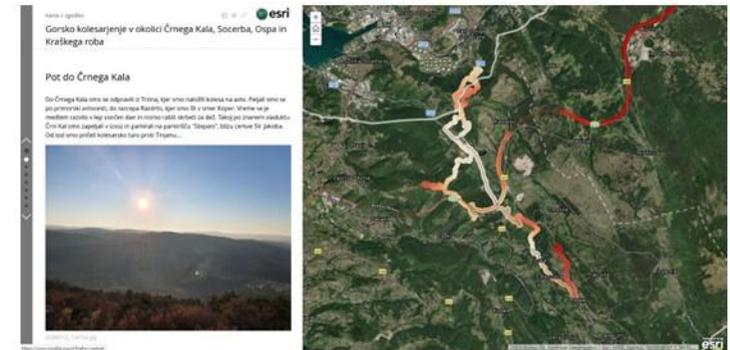


Fig. 2. Student project: Alamut—map of the novel.



## **AUTHOR**

Darja Mertelj,  
University of Ljubljana

## **COUNTRY**

Slovenia

## **FIELD OF HUMANITIES**

Languages and literature

## **REQUIREMENTS FOR THIS ACTIVITY**

### **1. Digital technology:**

Computer (with a good screen, camera, microphone), smart phone, internet access.

### **2. Pre-existing knowledge and skills:**

None.

# **ICT TOOLS FOR PRACTISING PRODUCTIVE SKILLS IN FOREIGN LANGUAGE TEACHING**

Students record audio of themselves speaking in a foreign language and receive (oral, recorded) feedback, in order to improve, if needed.

## **GOALS**

Students receive YouTube links for audio-video comprehension and do comprehension tasks online. Students must read aloud several texts (assigned by the teacher once or twice a month) and send back links with their audio-recording. They receive feedback from the teacher.

The main goal is to improve reading and listening comprehension of students. In the education of future teachers, the main goal is to improve their performance when giving classes.

## AUTHOR

Matej Zupan, University of Ljubljana

## COUNTRY

Slovenia

## FIELD OF HUMANITIES

Arts: Music

## REQUIREMENTS FOR THIS ACTIVITY

### 1. Digital technology:

Any audio/video gadget connected to the Internet (digital camera, smart phone, computer) and Skype, WhatsApp, Viber, Zoom, FaceTime or a similar programme.

### 2. Pre-existing knowledge and skills:

None.

# TEACHING/LEARNING A MUSICAL INSTRUMENT DURING THE PANDEMICS

Teaching/Learning a musical instrument during a pandemic with the help of Skype, WhatsApp, Viber, Zoom, FaceTime etc.

## GOALS

Our general goal, set for these particular circumstances, was to mainly invest our time during the Covid-19 lockdown period to learn new compositions.

## KEY OUTCOMES

The main problem is the quality of the sound. All the regular equipment on the computers, phones, tablets is good for speaking/ narrating, but musical instruments have a much wider frequency scale. When the music instruments use higher frequencies, distortion occurs, which is quite annoying. This is why the students send me the recordings of every composition and since they have a chance to record them as many times as they want, their result is much better. During the process they must carefully listen to their recording and they repeat the recording until they are happy with it.

The final result of such teaching is sometimes much deeper knowledge because the responsibility for the final recording of a single composition brings awareness of the student and much higher quality.

## AUTHOR

Vincent Gaffney,  
University of Bradford

## COUNTRY

United Kingdom

## FIELD OF HUMANITIES

Archaeology

## REQUIREMENTS FOR THIS ACTIVITY

### 1. Digital technology:

Remote Sensing, imaging software and GIS.

### 2. Pre-existing knowledge and skills:

First degree in Archaeology (or another relevant or related discipline) 2:2 or above, other relevant qualifications are considered.

# LANDSCAPE ARCHAEOLOGY AND DIGITAL HERITAGE

3D methods of digitally documenting objects, sites, and landscapes offer significant potential to archaeology and heritage management. Digital data can be a way of archiving heritage (the need for this has been graphically illustrated by the loss of world heritage sites to conflict) and it is becoming the gold standard for commercial recording of sites and landscapes.

## GOALS

This Masters programme gives direct hands-on experience of current technologies used for acquisition of data and the manipulation, presentation, and analysis of data captured at all scales.

It provides a comprehensive understanding of approaches used in digital documentation - from 3D microscopy through to 3D landscapes. You will appraise the value and potential limitations of these approaches.

## KEY OUTCOMES

The curriculum comprises a core of compulsory modules to provide appropriate background in the theory and application of scientific methods in landscape archaeology and digital heritage.

The emphasis is on the learning of fundamental scientific principles across several disciplines and applying these to archaeological and heritage areas. The programme draws heavily on areas of expertise in the School of Archaeology and Forensic Sciences.

The programme comprises core modules throughout. In the first semester Remote Sensing and Archaeological Prospection & Visualisation provide scientific background to the programme and introduce a wide range of techniques that relate to digital capture of landscapes and heritage. Afterwards come modules that provide broad ranging skill-sets to identify learning needs and the resources. The last module focuses on the analysis of spatial data for a variety of purposes.

*Fig. 1. Biological Anthropology Research Centre (BARC).*



## AUTHOR

Lauren Cassell,  
Pembroke College Cambridge

## COUNTRY

United Kingdom

## FIELD OF HUMANITIES

History

## REQUIREMENTS FOR THIS ACTIVITY

### 1. Digital technology:

A dataset representing the contents of the casebooks, a web-based search interface and a viewer for high-resolution images of the manuscripts of the casebooks.

### 2. Pre-existing knowledge and skills:

Use of a database, casebook methodology for reading in detail the lives of early medics.

# CASEBOOKS

The Casebooks Project has been studying the medical records of the astrologers Simon Forman and Richard Napier using 80,000 astrological records written in archaic handwriting for teaching and research.

## GOALS

In the decades around 1600, the astrologers Simon Forman and Richard Napier produced one of the largest surviving sets of medical records in history. The Casebooks Project, a team of scholars at the University of Cambridge, has transformed this paper archive into a digital archive.

The Casebooks Project released the first batch of searchable cases in 2012. As the Casebooks Project released more cases and refined the search facilities, Forman's and Napier's records began to feature in new studies of the classic topics of melancholy, reproduction and gendered bodies etc.

## ADDITIONAL INFORMATION

<http://www.magicandmedicine.hps.cam.ac.uk/>

<https://cudl.lib.cam.ac.uk/collections/casebooks/1>

<https://github.com/CasebooksProject?tab=repositories>

## KEY OUTCOMES

The project has five main outputs: a dataset representing the contents of the casebooks; a web-based search interface; a viewer for high-resolution images of the manuscripts of the casebooks; explanatory material about the casebooks, the history of astrology and medicine, the project and its editorial conventions and other supporting information; a programme of academic and public engagement to improve the project's research.

Casebooks engages with questions central to the histories of science and medicine and the social, cultural and intellectual histories of early modern England.

For example Kassell's 'Fruitful Bodies and Astrological Medicine' (2018) uses Forman's and Napier's casebooks to consider how queries about generation were expressed within and shaped by encounters between patients and doctors in early modern Europe.

## AUTHOR

Angelique Richardson,  
University of Exeter

## COUNTRY

United Kingdom

## FIELD OF HUMANITIES

Languages and literature

## REQUIREMENTS FOR THIS ACTIVITY

### 1. Digital technology:

The lab offers 2D digitisation, 3D scanning, 3D printing, data visualisation support, filming of research and teaching events, podcasting support, server hosting and data storage and themed digital events.

### 2. Pre-existing knowledge and skills:

None.

# HARDY'S CORRESPONDENTS

The University of Exeter has a lab and research space for the Digital Humanities. In there they curate digital exhibitions, carry out high-resolution photography of manuscripts and other visual materials, and produce professional quality video and audio recordings. They are able to create digital facsimiles of the objects, allowing them to be handled and understood in a virtual space, protecting the original artefacts for future generations. Hardy's Correspondents is one of the projects carried out.

## GOALS

Hardy's Correspondents is a collaborative project between the University of Exeter and [Dorset Museum](#), which aims to make available for the first time over 5000 letters housed at Dorset Museum. These letters form part of Dorset Museum's Thomas Hardy Memorial Collection, the largest Hardy collection in the world, recently selected for the [UNESCO Memory of the World Programme](#).

Fig. 1. Map of the places concerned.



## KEY OUTCOMES

This collaborative project has created a database which is the foundation of a Web site with the aim to make available to the public over 5000 letters housed at Dorset Museum.

The website, [Phase One of the Hardy's Correspondents project](#), brings to the public images and fully annotated transcriptions of 100 letters to Hardy. These 100 letters, from friends, family, fans, readers and publishers, on subjects ranging from writing, wife sales, Wessex, and the welfare of animals, were transcribed and encoded in conjunction with the Hardy and Heritage collaborative PhD project between the University of Exeter and Dorset Museum.

## ADDITIONAL INFORMATION

<http://hardyrespondents.exeter.ac.uk/index.html>

<https://libguides.exeter.ac.uk/digitalhumanities/home>

## AUTHOR

John Rink,  
University of Cambridge

## COUNTRY

United Kingdom

## FIELD OF HUMANITIES

Arts: Music

## REQUIREMENTS FOR THIS ACTIVITY

### 1. Digital technology:

None.

### 2. Pre-existing knowledge and skills:

None.

# ONLINE CHOPIN VARIORUM EDITION (OCVE)

Online Chopin Variorum Edition (OCVE) has exploited emerging technical capacities for text/image comparison as well as recent musicological advances. It is one of three projects featured in the Chopin Online resource. It is a database and high-resolution imagery, a toolkit allows annotation.

## GOALS

An important body of primary source material has been comprehensively assembled for the first time, facilitating philological and style-historical investigation and encouraging new understanding of Chopin's compositional and publication histories.

The OCVE provides direct access to musicians and musicologists to Chopin's manuscripts and a range of impressions of the first editions of his music. The online catalogue excerpts and bar-level commentaries foreground the major differences between the manuscripts and multiple first editions, in addition to highlighting their chronological and filial relationships.

The annotation tools provide users with unprecedented scope to construct their own 'critical commentaries' within what amounts to a uniquely 'dynamic edition'.

The technical outcomes are generalisable to similar projects of a musical and/or non-musical nature and to other initiatives.

## KEY OUTCOMES

The main outcomes of the OCVE project have been as follows:

An online musical edition demonstrating the ways in which scholarship and technology can interact to mutual advantage.

An interlinked archive of digitised manuscript and printed sources of a large body of music, all of which can be displayed in various formats.

Detailed philological descriptions written by the scholarly team.

Personal annotation tools allowing individual users to create their own virtual OCVE with personal comments at several levels of granularity, and pick-lists of scores or works which persist between access sessions.

## ADDITIONAL INFORMATION

<http://www.chopinonline.ac.uk/ocve>

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