Evolving as a Digital Scholar

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Evolving as a Digital Scholar: Teaching and Researching in a Digital World.

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The Digital Scholar Framework

Wim Van Petegem

In this chapter we focus on

✓ A description of digital technologies and how they shaped the digital world of today in general.
✓ The need to develop digital competences for everyone and especially for scholars.
✓ Different existing frameworks to name, define and structure needed digital competences.
✓ The development of a three-dimensional Digital Scholar Framework that underpins the rest of this book.

Keywords: Digital technologies; digital world; digital competences; digital scholar framework.

1.1 The Digital World

It goes beyond saying that the world in which we are living nowadays is different from the one we lived in some decades ago, even some years ago. Our world (both our planet and our environment) is changing dramatically and quickly. Technology, and in particular information and communication technology (ICT), is one of the driving forces for these innovations, for good and sometimes for bad. For younger people it is hard to imagine a world in which there were no computers, no internet, no Wi-Fi, no social media. And for us, it is impossible to fancy which new electronic devices and digital applications will determine our future lives. Yet, we must cope with this new world, its opportunities and its challenges. Therefore, it is important we understand where we come from and where we are heading to in this digital world.

We don’t want to teach computer history here – there are better resources for this. However, we cannot deny that one of the major breakthroughs in the digitisation of the world was the introduction of the personal computer somewhere in the 80s. We moved from gigantic mainframes with far-end terminals to desktop computers, bringing computing power within reach. Several generations of microprocessors and improved display technologies
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have ultimately resulted in smaller and handier devices, like laptops and tablets. This evolution was accompanied by a similar transformation in telecommunication, from plain old telephone services (the so-called POTS, for those who still remember this acronym) to mobile telephony with a whole set of intermediate technologies. Needless to say, the smartphone as we know it today can be seen as a fusion between the two: we can still call but we can do so many more things with this device comparable to what we used to do with our computer.

Another milestone in this history is the development of the Internet and the worldwide web at the beginning of the 90s. Gradually, the world became more and more connected, literally with cables above and under the ground and even under the sea. This entire infrastructure has already been renewed a few times, with ever more efficient technologies, in that we no longer need the cables to connect our (personal) devices. More so, we expect that we will be connected with these devices anywhere, anytime, with sufficient bandwidth in order to e.g., watch television while commuting by train back home from work. The latter example hides another evolution, namely with the browser technology. Initially it was developed to hyperlink plain text documents, but it nowadays includes real-time streaming of high-definition multimedia contents. Another related aspect is the rise of social media. People wanted not only to retrieve information but also to contribute and share their own material with their family, friends, peers, community and, why not, the whole world. This gave a totally new dimension to ‘being connected’, from pure physically plugging in your device to virtually linking online with your own network of acquaintances. It also implies a much broader geographical perspective on your own world. Until not so long ago our view was primarily oriented towards the immediate local environment, but thanks to the potential of ICT we have now a more global outlook. However, there are voices that caution that we may have exaggerated a little in that respect and that we should go ‘glocal’ where we focus on the integration of the best of both worlds.

The above transformations in technology were accompanied by similar changes in our societal environment. It is commonly accepted that the introduction of ICT has pushed us from the industrial society into the information society. That is a society in which information is considered as a valuable resource, that citizens can create, use, share, manipulate, integrate, etc. to the benefit of their economic, political, cultural or other activities. One step further was the creation of a knowledge society which transformed information into added value, resources or actual knowledge that allows the members of the society to improve their human condition and living
standards. Nowadays, the concept of a network society describes the world in which we are living pretty well. According to Manuel Castells (2010), a network society is a society where its structures, organisations and activities are substantially based and relying on (digital) information and communication networks. One could wonder what would be the next step: will it be the wisdom society as described by Dalal (2008)?

What we know for sure, is the fact that ICT has led to applications and innovations in all sectors of economic activity: health care (telemedicine, robot surgery, electronic health records, etc.), finances (e-banking, cashless payments, cryptocurrencies, etc.), commerce (e-invoices, online shopping, etc.), tourism (online travel agencies, e-hospitality, etc.), transport (navigation systems, self-driving cars, etc.), culture (virtual museums, internet radio and television, etc.), government (e-ID, electronic voting, tele-administration, etc.), and others. New, sometimes disruptive business models are necessary to implement these innovations, and therefore need to be invented, always taking into account their advantages and disadvantages. Issues like accessibility, trust, cost, accountability, transparency, convenience, speed, acceptance should be paid proper attention to. And yes, also education does not escape from this tendency, but that will be explained in more detail later in this book.

Next to, or maybe even due to, the technological changes, people have changed as well. We might have heard of the Baby Boomers, typically born in the two decades after the Second World War. They are preceding Generation X, the cohort born from the early-to-mid 1960s to the early 1980s. This generation was followed by the Millennials, also known as Generation Y, with birth years between the early 1980s and the mid-1990s to early 2000s. This is the first generation of young people coming of age in the information society, and as a result they learnt very easily to use digital technologies and social media. The current demographic cohort is called Generation Z. These youngsters were born in a world full of technology and have used ICT tools and in particular the internet from early childhood on. They can simply not imagine a world without and expect ubiquitous access to the internet, with ever smaller devices and at a low, preferably no cost. And these young people are entering higher education now.

All the above evolutions indicate that the world in which we are living, working and learning has changed a lot thanks to, or at least due to, the technological changes. The adoption of ICT in our daily lives has a tremendous impact on all our activities. It is difficult to predict where this is going to in the long run, but even in the short term, we can hardly foresee which innovations new digital technologies might bring. And it is in this digital world
that a Digital Scholar must survive. Before we start with the survival trip, we need to make sure we are talking a common language, i.e., we need to define what we mean by ‘digital technologies’, ‘digital competences’ and a ‘Digital Scholar’, all in the context of higher education.

1.2 Digital Technologies

The word ‘digital’ comes from the Latin word ‘digitus’ (finger), by the way one of the oldest tools used for counting. And the word ‘technology’ stems from the Greek word ‘tekhnē’ (art, craft) and ‘logia’ denoting a subject of study or interest.

The combination of words ‘digital technology’ started to be used in the middle of last century, when engineers built the first computing system, using the theory developed by the 17th-century German mathematician, Gottfried Wilhelm Leibniz. His concept was based on a binary code, consisting of 0s and 1s (called bits), rather than the decimal numeral system we are more familiar with. The first (non-mechanical) calculating system was comprised of vacuum tubes to implement this binary code. But soon, with the introduction of the semiconductor transistor, this technology could be miniaturised dramatically. This in turn allowed one to compress huge (at the time) amounts of bits in a small device, where they could be stored, transformed, retrieved and transmitted in an easy way. And that was the major breakthrough for digital technology. Where the early computers were merely seen as number crunchers, i.e., manipulating large sets of data in a rather simple way, the technology became more and more sophisticated and allowed more and more complex processes. Until today new technologies are emerging and adding to this evolution: internet of things, artificial intelligence, blockchain technology, augmented reality, etc.

While in the beginning the term ‘digital technology’ was mainly describing a computing device, i.e., a tangible piece of equipment, nowadays the term is used with a much broader meaning. It could include not only devices but also digital platforms, systems, tools and apps, infrastructure, processes, services, methods, resources, and so on. A taxonomy to bring some order to this apparently chaotic multitude of digital technologies could help but is hard to find, although some attempts have been made by, for instance, Berger (2018). For the purpose of this book, it is sufficient to realise that there is a wide spectrum of digital technologies available to users.

It is more important to recognise what is called the affordance of the digital technology at stake. An affordance is “the quality or property of an object
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that defines its possible uses or makes clear how it can or should be used.

In the literature there is some discussion whether this refers to an inher-
ent characteristic of the object, rather than a property which is attributed
by the environment or context. Alternatively, is it perceived by the user of
the object, i.e., is affordance related to utility (usefulness) or to usability?
Both meanings have their value and could be used in this book. Matt Bower
(2008, pp.6-7) classifies the affordances of digital technologies in the context
of higher education as follows in terms of ‘abilities’:

1. Media affordances – the type of input and output forms, such as text
(“read-ability”, “write-ability”), images (“view-ability”, “draw-abil-
ity”), audio (“listen-ability”, “speak-ability”), video (“watch-ability”,
“video-produce-ability”).

2. Spatial affordances – the ability to resize elements within an inter-
face (“resize-ability”), move and place elements within an interface
(“move-ability”).

3. Temporal affordances – access anytime anywhere (accessibility), abil-
ity to be recorded (“record-ability”) and played back (“playback-abil-
ity”), synchronous versus asynchronous (“synchronicity”).

4. Navigation affordances – capacity to browse to other sections of a
resource and move back/forward (“browse-ability”), capacity to link
to other sections within the resource or other resources (“link-abil-
ity”), ability to search (“search-ability”) and sort and sequence
(“data-manipulation-ability”).

5. Emphasis affordances – capacity to highlight aspects of a resources
(“highlight-ability”), explicitly direct attention to particular compo-
nents (“focus-ability”).

6. Synthesis affordances – capacity to combine multiple tools together
to create a mixed media learning environment (“combine-ability”),
the extent to which the functions of tools and the content of resources
can be integrated (“integrate-ability”).

7. Access-control affordances – capacity to allow or deny who can
read/edit/upload/down-load/broadcast/view/administer (“permission-ability”), capacity to support one–one/one–many/many–many
contributions and collaborations (“share-ability”).

8. Technical affordances – capacity to be used on various platforms
with minimal/ubiquitous underlying technologies, ability to adapt to
bandwidth of connection, speed & efficiency of tool/s.

9. Usability – intuitiveness of tool, ease with which user can manipulate
tool to execute its various functions, relates to efficiency.
10. Aesthetics – appeal of design, appearance of interface, relates to user satisfaction and ability to hold attention.

11. Reliability – robustness of platform, system performs as intended whenever required.

Although the list dates from 2008, Bower and colleagues (2015) have continued their work and expanded the list by, for example, including wearable devices. Understanding and appreciating affordances of digital tools come in handy when a Digital Scholar will have to assess the potential of a certain digital technology for his or her academic work.

One final note here is on the adjective ‘digital’. One can argue whether it is still necessary to use this term: is not all technology nowadays in one or another way digital? Or, put differently, does the digitisation not go so far that it is commonly accepted, and even simply assumed? Hence, the digital aspect becomes a sort of natural characteristic of all technology, and as such it becomes an obsolete distinctive descriptor that might as well be dropped. We already see that many ICT supported activities are becoming more and more generalised, and the technology itself is becoming invisible. As an example, we are getting so used to cashless payments that we no longer realise the whole (digital and technological) infrastructure behind. Some authors, like Paiva et al. (2016), tried to apply this idea of technology becoming ubiquitous and invisible to the world of education as well and they describe we are moving from e-learning back to learning again. For the purpose of this book, we will continue to use the term digital technologies, to make it clear we are not talking about other forms of technology such as books, etc.

1.3 Digital Competences

The advance of all these digital technologies requires new skills from their users which implies that they need to have digital competences. What does that mean?

It is widely accepted that ‘competence’ could be defined as one’s ability to mobilise knowledge, skills, attitude, insights and values in order to perform a given task successfully in a certain context. In the world of today, our contexts have become more and more digital with tasks also being performed by digital technologies. So, ‘digital competence’ could be simply defined as ‘the competence to act in today’s digital world’. What that entails, will be explained below.
Limited research articles are published on this topic, but we could find some policy documents that, for example, were published by the European Commission. The commission developed a Digital Competence Framework for all European citizens, version 2.0, in 2016. This framework identifies the key components of digital competence in 5 areas which can be summarised as below:

1. **Information and data literacy:**
   - To articulate information needs, to locate and retrieve digital data, information and content.
   - To judge the relevance of the source and its content.
   - To store, manage, and organise digital data, information and content.

2. **Communication and collaboration:**
   - To interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity.
   - To participate in society through public and private digital services and participatory citizenship.
   - To manage one’s digital identity and reputation.

3. **Digital content creation:**
   - To create and edit digital content.
   - To improve and integrate information and content into an existing body of knowledge while understanding how copyright and licences are to be applied.
   - To know how to give understandable instructions for a computer system.

4. **Safety:**
   - To protect devices, content, personal data and privacy in digital environments.
   - To protect physical and psychological health, and to be aware of digital technologies for social well-being and social inclusion.
   - To be aware of the environmental impact of digital technologies and their use.

5. **Problem solving:**
   - To identify needs and problems, and to resolve conceptual problems and problem situations in digital environments.
   - To use digital tools to innovate processes and products.
   - To keep up to date with the digital evolution.

The commission also developed a specific framework for educators, called DigCompEdu.
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This framework provides a general reference frame to support the development of educator-specific digital competences in Europe, at all levels of education. DigCompEdu details 22 sub-competences organised into six areas:

- Area 1 focuses on the professional environment;
- Area 2 on sourcing, creating and sharing digital resources;
- Area 3 on managing and orchestrating the use of digital tools in teaching and learning;
- Area 4 on digital tools and strategies to enhance assessment;
- Area 5 on the use of digital tools to empower learners;
- Area 6 on facilitating learners’ digital competence.

Areas 2 to 5 form the pedagogic core of the framework. They detail the competences educators need to possess to foster effective, inclusive and innovative learning strategies, using digital technologies.

Another valuable resource is the work done by JISC, the UK higher, further education and skills sectors’ not-for-profit organisation for digital services and solutions. JISC talks about ‘digital capabilities’ as opposed to digital competences. At the individual level they define a framework for digital capabilities with the following six elements:

- ICT Proficiency (functional skills)
- Information, data and media literacies (critical use)
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- Digital creation, problem solving and innovation (creative production)
- Digital communication, collaboration and partnership (participation)
- Digital learning and development (development)
- Digital identity and wellbeing (self-actualising)

Interestingly JISC presents this framework not only for staff and students, but it also refers to digital capabilities at the organisational level. We indeed need to look beyond the capabilities of individuals and consider the extent to which the culture and infrastructure of an institution enable and motivate digital practices, but this is beyond the scope of this book.

The above frameworks are creditable attempts to describe the complexity of digital competences by breaking them down into more recognisable...
components and ordering these in a meaningful way. These frameworks are valuable in order to understand what is expected from us, individuals, citizens, teachers, scholars, living and working in a digital world. They often come together with instruments to measure to what extent or to what level one has reached (partial aspects of) digital competence. And moreover, they offer some pointers on how to become more digitally proficient, i.e., on how to move from one level to the next one on the digital competence ladder. We will not elaborate further on these frameworks here, but we invite the reader to go and study the indicated references if interested in more details.

1.4 The Digital Scholar

Scholars are people who devote themselves to study, particularly to an area in which they have developed expertise. For a more extensive description of a scholar please refer to the work of Boyer (1990). The traditional concept of scholarship was viewed as the scientific discovery of new knowledge and had been the centre of academic life and was crucial to an institution’s advancement for decades. Boyer articulated a new paradigm for faculty scholarly activity, because it needed to be broadened and made more flexible to include not only the new social and environmental challenges beyond the campus but also the reality of contemporary life. He came up with four functions of scholarship:

- The Scholarship of Discovery – This focuses on the creation of new knowledge in a specific area or discipline, and is thus often taken to be synonymous with research.
- The Scholarship of Integration – This aspect emphasises the synthesis of (new) knowledge by linking topics within one discipline, or by making connections across disciplines. It requires the placement of specialities in larger contexts by illuminating data in a revealing way that makes them accessible and educating non-specialists.
- The Scholarship of Application (later also called the Scholarship of Engagement) – This function relates to the concept of service within or outside the university, which might include peer-reviewing journal articles or grant applications and sitting on various committees. It also includes, for instance, input into policy making and general media discussions.
- The Scholarship of Teaching – This aspect is more than just focusing on teaching – it includes the systematic self-study combined with peer review of our own practice of teaching. By emphasising this aspect, an attempt is made to raise the profile of teaching.
Each of the three traditional forms of scholarship (teaching, research, and community service) can be seen to perform all four functions of scholarship as defined by Boyer (discovery, integration, application, and teaching).

Who then, is the Digital Scholar? Again, we could simply say that this is a scholar living and working in the digital age. Weller (2018) defines a digital scholar as someone who employs digital, networked and open approaches to demonstrate specialism in a certain disciplinary field. The ‘digital’ and to some extent also the ‘networked’ component in this definition have been addressed above, but we will come back to this and the ‘open approaches’ later in the book.

Traditionally we think of a scholar as a recognised academic, a person who works as a teacher or researcher at a university or other higher education institution, and who usually holds an advanced degree. For this book we do not necessarily look at academic staff (faculty), but e.g., professional and support staff in teaching and learning centres or educational consultants without any institutional affiliation could also qualify as scholars, and especially as digital scholars. Everyone scholarly active (according to the above-mentioned functions of modern scholarship) in a digital, networked, open world could call themselves a digital scholar.

1.5 The Digital Scholar Framework

In order further to analyse the concept of digital scholarship, we present our own digital scholar framework and its key components which we will be using throughout the book as our golden thread.

We consider three distinct ‘dimensions’ in the concept of a digital scholar.

1.5.1 The Digital Scholar as a Human Being
First of all, a digital scholar is an individual human being. This means that s/he has a certain, unique personality that comprises his/her identity, including a digital identity. S/he is fully aware of her/himself and is taking an own stance, an own position in the digital world, as a single person. Nevertheless, this always happens in relation to others. A digital scholar is member of a team with like-minded colleagues in the own discipline, the own department or any similar entity, using amongst others digital technologies to bond together. The teams themselves belong to a bigger organisation, usually the institution (i.e., university or any other higher education institution). Digital scholars are employees of this institution, which entitles them to work across various borders, such as interfaculty or interdisciplinary. The
academic institution, usually comprising one or multiple physical campuses, or maybe a virtual one, is no longer an ivory tower. It is embedded in a local community, a society of which the digital scholar is an active participant, in two ways: digital scholars bring back their knowledge and expertise into the society and vice versa is society triggering the work and expertise building of the digital scholar. Finally, a digital scholar is also a global citizen. It has already been said that thanks to the digital technologies the world has become more open and more connected, enabling digital scholars to collaborate with peers across the globe, and to share their expertise with virtually the whole world.

This dimension is represented in the figure by concentric circles, symbolising the fact that it all starts from yourself, and in the ever-growing action radius of the environment in which a digital scholar is operating.
1.5.2 The Digital Scholar as an Academic

By far the most obvious dimension in the framework is dealing with what we need to do. In other words, what we are supposed to do as academics, as scholars in our daily encounters. A digital scholar works in an academic environment where s/he is involved in research, teaching and service. The latter is sometimes also referred to as community service, social impact, science communication and/or outreach. For the purpose of this book, we will be referring to the traditional triad of academic life and not Boyer’s forms of scholarship.

This dimension is represented by moving arrows which implies that these activities are always there in the back of our minds. The arrows also suggest that all three types of activities follow each other but at the same time inspire each other as well. It must be clear that a digital scholar, like any other scholar, is always balancing between these three aspects, and sometimes even jumping from one to the other, not necessarily in the order as indicated in the framework. Typical for a digital scholar is that s/he is able to benefit from the advantages that digital technologies offer for academic work, for the three aspects separately, but also and maybe above all, for an integrated approach to these three aspects.

1.5.3 The Digital Scholar as a Role Player

Maybe the most challenging dimension in the framework is the one related to different roles a digital scholar could play. With this aspect we want to emphasise that a digital scholar is not just a human being, is not just doing what is expected from someone in an academic environment, but s/he actively takes up a role in the digital world of today. Digital scholars use their (digital) competences at different levels, and that could potentially lead to different roles they play. We distinguish five of them for the purpose of this book, from simply using words (as an ‘author’), over bringing a strong message (as a ‘storyteller’) and illustrating the story with media (as a ‘creator’), to packaging the message with all media included (as an ‘integrator’) and ultimately sharing it with a larger audience (as a ‘networker’). This will be the core of the book and each of these roles will be explained in full detail in the next chapters.

These roles are presented in the framework as a pie chart. It could be argued that there is a sort of hierarchy in the different roles, based on the level of digital competences needed to play the specific role. The role of ‘author’ would then be the easiest, simple role, with only a basic set of digital competences, while a ‘networker’ would have the richest set of these competences. We are not denying that there is some truth in this view, and actually
we will use this logical order as guideline for the book. Nevertheless, we would like to emphasise that in reality a digital scholar feels comfortable in constantly switching between the roles and maybe even taking up multiple roles at once, depending on the occasion. Of course, this demands a high level of digital competences.

1.6 Evolving as a Digital Scholar

Indeed, the whole idea of the Digital Scholar framework is to move within and between the three specified dimensions of a digital scholar as a human being, as an academic, and as a role player. It is tempting inherently to interpret some of the dimensional aspects in terms of levels of maturity. And to a certain extent this is true. However, evolving as a digital scholar not only refers to linearly growing and developing digital competences, but also to exploring, hopping around and jumping back and forth, sometimes failing, sometimes succeeding, but always and steadily acquiring new competences in a more complex, sophisticated way.

The European Commission uses the metaphor of learning to swim when it comes to developing digital competences in relation to its Digital Competence framework. As swimming is a skill we all have to learn, this metaphor very well fits for developing as a digital scholar as well. In the beginning you only dare to put your toes into the cold water. After exercising the swimming movements on dry land, you carefully enter the water, the shallow water of course, and with the help of the trainer (and maybe a swim ring) you splash around a bit until you can also perform the practised movements in the water without any help. Once you have got there, you start to enjoy it, and you venture in the deeper water as well. Sometimes it is hard to keep your head above water, though you feel safe as there will always be a lifeguard around in the swimming pool. For the more adventurous amongst us, a next step is to swim in the wild water, in the sea (or even the ocean, as the European Commission suggests). Or, if you prefer, you start with deep diving. And why not, you can also become an instructor, or a lifeguard yourself. Ample opportunities to become more experienced, and to share your expertise with others.

It must be clear that also as a digital scholar we will first have to set a few small steps, then to practise a lot before we eventually enjoy and can take on new roles.

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1.7 How to understand and use the Digital Scholar framework

As indicated, in this book we will focus on the dimension of the framework that refers to the different roles a digital scholar can play. The chapters are organised accordingly. We aim to deepen and broaden these roles by explaining what they entail, but also what kind of digital competences are considered as vital in this role. Each role will also be linked with the other two dimensions of the framework. Indeed, while playing a role, a digital scholar should not forget he or she is a human being as well as an academic. Moreover, the development of digital competences should not be limited to the ‘roles’ part, but should be seen in a more integrated way, including the two other dimensions too. It is not our aim to each time make a full coverage of all elements in the framework, though we hope to give enough background, good practices and inspiring examples for the future digital scholar to fill in the blanks or connect the dots according to own insights.

We already mentioned that a digital scholar is not constrained in one role, nor in one aspect of the two other dimensions. In other words, a digital scholar cannot be caught in just one cell of the framework or should not go through the framework in a simple linear way. A digital scholar should be agile or flexible enough to jump around, to find the right balance and maybe to combine different aspects together in the daily practice. When reading the book, the framework should be seen as something dynamic, a spinning wheel or a rolling ball, with stretchy and sometimes moving boundaries. Being able to cross the imaginary borders between the cells in the framework is an essential capability of a digital scholar.

We hope to take you on a journey with this framework and provide you with a trustful compass to find your way, to evolve and become a digital scholar in action!

References


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