Qualitative and Quantitative Methods in Libraries (QQML) 8,3: 307-321, 2019

The conceptual, structural and organisational features of the doctoral programme in information and communication sciences at the University of Zagreb

Nikolaj Lazić, Jadranka Lasić Lazić and Sonja Špiranec
Faculty of Humanities and Social Sciences, University of Zagreb, Croatia

Abstract: *Purpose:* The aim of this paper is to present the conceptual and structural features of the doctoral programme in the field of information and communication sciences at the University of Zagreb. Since an analysis of a doctoral study programme is inseparable from deliberations over the identity and recognisability, and hence the status, of a given scientific field, the paper will attempt to provide an answer to questions of theoretical groundwork and dilemmas that shaped the conceptual framework of the University's present, reformed doctoral programme in information and communication sciences, and present how its organisation has been defined by EU strategies and policies in science.
Methodology/approach: Addressing a lack of relevant resources that would enable the gaining of systematic insight into the history and development of doctoral programmes in information and communication sciences in Croatia, the paper presents the results of the qualitative analysis focusing on literature outlining the theoretical profile of the field of information and communication sciences as well as on EU guidelines on PhD programmes to present problems and solutions related to the restructuring of doctoral programmes in this field.
Findings: The paper provides a systematic overview of the conceptual and structural features of the doctoral programme in information and communication sciences at the University of Zagreb and presents arguments according to which all attempts at its reform are inseparable from deliberations over the field's theoretical scope, its recognisability and the related status. Also, it indicates as necessary that this doctoral programme has to be (re)structured in such a way as to respond to the theoretical and intellectual dispersion characterising the field and its modules be based on EU guidelines on doctoral study programmes.
Originality/value: The paper presents a valuable response to a relative lack of resources and literature on the (re)modelling of doctoral programmes in the field of information sciences based on the analysis of theoretical dilemmas present in the field and EU guidelines on structuring doctoral programmes.
Keywords: doctoral programme, education, programme organisation

Received: 1.5.2019 Accepted: 13.9.2019 ISSN 2241-1925

1. Introduction

Ideas aimed at the creation of the European Higher Education Area (EHEA), first outlined in the Bologna Declaration, have started being acted upon at the highest political level. Comprehensive reforms in this context in Europe, insisting on mobility, openness and quality as the factors driving social development, have been particularly targeting doctoral programmes. A practical debate on the structuring of doctoral programmes was initiated at the 2003 Ministerial Conference in Berlin (European Commission, 2003), which was followed by several conferences and seminars aimed at the development of guidelines and principles for organising PhD programmes in the European Union and the setting of joint objectives that will contribute to social development and result in the integration of European science. In this connection, changes affecting the whole of society are based on information and communication technology, i.e. an easy transfer of information and knowledge and fast communication of research results through the internet, while education is constantly insisted on as the most dominant factor in the creation and spreading of knowledge that transforms the global community.

Doctoral education at Croatian universities has also been transforming under these circumstances. Although reforms are affecting doctoral programmes in all scientific fields, those similar to information sciences, owing to their recent appearance and marked interdisciplinarity, are approaching these reform and restructuring initiatives in a particularly comprehensive and carefully thought-out way. Reforms required in such fields have not been of solely structural or organisational nature, but have also affected the conceptual level and included debates on the intellectual origin and theoretical groundwork of a given field (Ferlindeš & Špiranec, 2018).

The aim of this paper is to present the development, and especially conceptual and structural features of the present doctoral programme in information and communication sciences at the University of Zagreb. Since an analysis of a doctoral study programme is inseparable from deliberations over the identity and recognisability, and hence the status, of a given scientific field, the paper will attempt to provide an answer to questions of theoretical groundwork and dilemmas that have shaped the conceptual framework of the University's present, reformed doctoral programme in information and communication sciences, and present how its organisation has been brought into line with EU strategies and policies in science. Also, the paper will analyse the programme's internal structure resulting from theoretical deliberations and the presented strategic characteristics.

2. The doctoral programme's foundations

The story of this particular PhD programme, which was instituted in the field of information sciences and today includes the field of communication sciences as well, would be incomplete if we would leave out the account of the entire context and the programme's foundations, while the visionary idea of the great

professor Težak, the founder of the first postgraduate study in this scientific field in Croatia, would thus unjustly be omitted. These visionary foundations, which were then laid at the University of Zagreb, represent the very starting point of today's doctoral programme in information and communication sciences in Zagreb.

Precisely now, at the time of reforms and accreditation of all PhD programmes, it is particularly useful to remind ourselves of the idea based on which professor Težak established the information sciences postgraduate course, which then embodied the very principles contained in the guidelines set out at the Ministerial Conference in Berlin (European Commission, 2003). Professor Težak understood only too well that without access to scientific information and without information specialists, who will have the knowledge and skills necessary to process and search the world's scientific heritage, there is no development of national science nor the development of academic research and higher education systems. Since its beginnings, information and communication technology proved to be the driving force of social development, so Professor Težak introduced it into the postgraduate programme. The significance of ICT is today evidenced by numerous conventions and charters of various international organisations and it is prioritised as part of the national guidelines of the overwhelming majority of world countries as a strong driver of development that has to be made widely available to all. Also, the right to access information is currently considered one of the fundamental human rights in democratic societies, while the education of information specialists is widely insisted on as a social need, owing to the role of skilled information specialists and free flow of information in enabling social development and competitiveness of communities on the global market. When a consensus on the academic legitimacy of establishing information sciences as a separate scientific field was reached in the 1960s, there was no agreement on its subject. It initially included disciplines such as library science, archival studies, museum studies, informatics, which were previously strictly considered professions, and the first such postgraduate programme was run by the so-called Centre for Library, Documentation and Information Sciences (*Centar za studij bibliotekarstva, dokumentacije i informacionih znanosti*, CSBDIZ). Being visionary once again, almost entirely anticipating the major principles characterising contemporary doctoral education, Professor Težak introduced the principle of interdisciplinarity into the postgraduate programme in information sciences of the Zagreb university right in the beginning. Issues regarding the theoretical aspects of the development of information sciences were taken as the starting point for establishing the programme's theoretical groundwork. Clearly, a uniform theory was impossible here, owing to the intertwining of disciplines that have as many common elements as they have those in which they differ. The central common element was based on defining information on the one hand, and the context set by institutions that collected, processed, organised, presented and disseminated data, information, and recorded knowledge conveyed through different media on the other. Social conditions and changes,

together with technological development, particularly the development of information and communication technology, shaped the perspective of those who wished information sciences to acquire the same status as that of natural sciences, while at the same time they tried to consolidate this newly-established field by taking into account the traditional professions that it originated from. That consolidation was possible only through the integration and structuring of all elements in its theoretical makeup, which in turn would provide the basis for defining the core of the postgraduate programme.

The task of information sciences, as they were perceived by Professor Težak, was to train scientists and professionals who will use their expert knowledge and practices to assist the development of science and education in general by focusing on problematic issues related to the organisation and communication of information that the global community was facing. Without high-quality, authentic and reliable sources of information and knowledge, as Težak described them through his famous ETAkSA complex[1] theory, it was not possible to achieve development nor be competitive in the given scientific field. Emphasising that without scientific information and information specialists high-quality research is not possible in any scientific field, Težak said: *every phenomenon in the field of communication, as a result of inside or outside processes or operations, may be classified under one or more concepts included in the ETAkSA complex. And this is true for all fields, both those that cover the complete, theoretical and systematically organised human knowledge and those that cover only limited or specific sectors of more or less isolated human activity. This is therefore true of science, learning and research of the fundamental, applied and developmental kind, as well as of every organised activity in the field of education, health services, technology, economy, administration or any other kind of activity at the operational level* (Težak, 1969).

This shows that today's standards of doctoral education, contained in the current European guidelines and official documents, were incorporated into the very foundations of the postgraduate programme in information sciences at the University of Zagreb more than 40 years ago, owing to the advanced and original scientific thought of Professor Težak.

3. The reform of the programme in information and communication sciences as the third educational cycle

The PhD programme in information sciences at the University of Zagreb was instituted in 2005 as the third educational cycle according to the Bologna system. In its beginnings, the programme was not predominantly research-oriented, but mostly focused on attending lectures and the subsequent taking of exams. The dissertation was based on research, but it was regarded as the

[1] The so-called ETAkSA complex refers to the theory and practice of the emission, transmission, accumulation, selection and absorption of information.

programme's final result. The programme consisted of compulsory and elective courses, which the students chose according to their interests. They would submit their PhD research proposal in the third year of the programme, after passing all the mandatory exams and publishing a paper in co-authorship with their supervisor. It became obvious that such an approach diverged from the ideas and guidelines contained in relevant EU documents regarding doctoral education, owing to which the need to reform the programme was recognised soon after its establishment. The first significant formal change was introduced in 2010, prompted by the changes in the structure of the field of information sciences, whose name was changed to information and communication sciences and which, instead of the former eight disciplines, now started to encompass 11 (Nacionalno vijeće za znanost, 2009, 2012, 2013). This transformation resulted in the PhD programme opening towards these newly introduced disciplines, while at the same time the programme's planned reform started to be approached on three levels, i.e. conceptual and content-related, structural and organisational, which all resulted in the new programme that was accredited by the Croatian Ministry of Science and Education in 2017. Next, we will present the foundations based on which the programme was remodelled in conceptual, structural and organisational terms.

3. 1. The conceptual guidelines for the programme's reform

The programme's conceptual foundations were restructured based on the consideration of the specific features of information sciences as a field and scientific discipline, as well as of its position in relation to other academic and scientific fields. Taken as fundamental in this context was a comprehensive body of literature according to which the scientific field of information sciences lacks its own unique and widely accepted definition (Robinson & Karamuftuoglu, 2010), is characterised by the dispersion of its intellectual origins, in which connection that same literature often challenges, or even denies the field's scientific status and criticises its practical focus (Ferlindeš & Špiranec, 2018). At the same time, there had not been any substantial analyses of doctoral education in the field of information sciences on a global scale (Sugimoto et al, 2009) whose findings could be used as a model for redefining the programme.

A valuable insight into the possible conceptual grounding of information sciences was provided by *Knowledge Map of Information Science*, a 2003 – 2005 study that brought together 57 leading scholars from 16 countries with the aim of exploring the foundations of information science and defining its basic concepts. The outcomes of and reactions to this research initiative indicated great differences in the understanding of information and information sciences (Zins, 2007a; Zins, 2007b; Zins, 2007c; Zins, 2007d) and in approaches to the field of information sciences, in which context several models were singled out: the hi-tech model, technology model, culture model, human world model, living world model, and living and physical worlds model. This and other similar studies (Bawden, 2008) showed that the field of information sciences, instead of

having a unique conceptual groundwork, follows different approaches (e.g. objective vs. cognitive) and different traditions (e.g. that associated with libraries, documentation science, computer science), which in itself implies that it has its roots in different knowledge domains (Robinson & Karamuftuoglu, 2010). Furthermore, the broadening of the field of information sciences through the adding to it of communication science made defining the conceptual profile of the doctoral programme in information sciences in Croatia even more complex, regardless of the fact that this integration was previously recognised in literature (Borgman, Rice, 1992) and accordingly implemented in similar PhD programmes in many countries across the world (PhD programmes of Rutgers School of Information and Communication, Kent State University and UCD School of Information and Communication Studies). However, regardless of the disciplinary identification and profiling of individual doctoral programmes (e.g. towards library and information science, documentation science, information systems, communication sciences), all doctoral programmes in this field, including the programme at the University of Zagreb, are highly interdisciplinary and multidisciplinary, owing to a universal and unstable nature of the concept of information and its belonging to different fields. Also, taking into consideration the changed role of information in today's society further made necessary the development of new approaches to doctoral education which would gear it towards expectations and requirements related to the central role of information in the contemporary society (Druin et al, 2009). Starting from this, and also taking into account a growing complexity of information processes and interactions, interdisciplinarity, which enables the integration of different perspectives in resolving complex issues, asserts itself as the principal feature of information sciences. At the same time, such an approach implies considerable challenges, particularly in the context of attempting to establish a unique conceptual groundwork and define a lexicon to be used in describing the field's phenomena or major points of reference. For this reason, the field specialists attempting to establish the conceptual groundwork of the PhD programme in information sciences at the University of Zagreb, like their colleagues who were trying to do the same with similar doctoral programmes around the world (Druin et al, 2009)., eventually abandoned the idea of the programme's strictly defined theoretical core and instead saw as advantageous providing students with insight into the emerging and comprehensive interdisciplinary perspectives through offering a combination of different modules and research topics. This by no means implied a lack of theoretical grounding or complete theoretical dispersion, but resulted in the establishment of a theoretical module covering three approaches: the first draws on epistemologies and methodologies from natural and technical sciences in order to consolidate a field predominantly rooted in social sciences and humanities, the second originates in sociology, linguistics and philosophy, while the third approach is media- and communication-oriented.

3. 2. The structural guidelines

The framework for the structural reform of the doctoral programme in information and communication sciences at the University of Zagreb was based on numerous communiques, documents and subsequent guidelines issued during the 1990s as part of the so-called Bologna Process, aimed at the establishment of the European Research Area (ERA). PhD programmes became the focus of attention at the 2003 Ministerial Conference in Berlin, which highlighted the key role of doctoral programmes in the creation of a coherent European Research Area and identified them as the third educational cycle principally focusing on the development of research skills, and promoting interdisciplinarity. The communique (European Commission, 2003) issued as a result of the 2003 Berlin Ministerial Conference prompted numerous other documents, activities and studies attempting to determine the future of doctoral education in Europe, among which the so-called Salzburg Principles stood out as crucial, owing to their focus on the harmonisation and integration of various reform tendencies debated in the context of doctoral education at the time (European Commission, 2005). In the first place, the Salzburg Principles insist on recognising the specific nature of doctoral education in relation to the first and second higher education cycles, since it is based on conducting individual and unique research, which requires institutions conducting doctoral programmes to build and foster a research-oriented mindset among their students. Five years after the publication of the Salzburg Principles, the EUA Council for Doctoral Education issued Salzburg II, a document complementing the Salzburg Principles by reinforcing their content and laying down specific details concerning their implementation (European University Association, 2010).

In the context of the reform of the doctoral programme in information and communication sciences in Zagreb, the Salzburg Principles signalled a different concept of study, primarily in relation to the understanding and structuring of the educational process, but also in relation to the role of the doctoral candidate. We will analyse the specific criteria laid down by the Salzburg Principles and used as starting points in the restructuring of the PhD programme in information and communication programme at the University of Zagreb.

First of all, the Principles emphasise the importance of the programme offering an individual approach, which is adjusted to the requirements of each PhD student, as well as of the entire programme being research-oriented and focused on original research project with clearly defined practical implications, thus insisting that *doctoral education is highly individual and by definition original. The path of progress of the individual is unique, in terms of the research project as well as in terms of the individual professional development* (European University Association, 2010, p. 3).

Such a guideline implied the need to base the programme on activities that would differ from the standard lecture-oriented model, as well as to offer

possibilities for combining and scheduling these activities according to each PhD student's needs. Accordingly, the number of compulsory courses has been reduced, with more credits being awarded for various types of research activities, both individual and group. Trying not to limit but support the doctoral candidates on their unique individual paths of maturing from a researcher to scholar, the programme now offers a highly flexible system of earning ECTS credits, in which context there are practically no standard examinations. The doctoral candidates accumulate credits through individual work with research staff and later with their supervisors, through devising and revising their own research strategy, participation in conferences and workshops, which enable them to develop and strengthen their research and generic competences, through teaching and lecturing, spending terms at foreign universities, group work and project assignments at doctoral summer schools, etc. In other words, the programme is based on the candidates' own strategy, which they work out essentially as the strategy for the development of their research career, in cooperation with their supervisors, while the means of evaluation of the candidates' work are completely different from those in undergraduate and graduate programmes, and are entirely research-based.

The Salzburg II recommendations particularly focus on ensuring transparency of the admission procedure and providing high-quality supervision. Based on these principles, criteria for the admission to the doctoral programme in information and communication sciences at the University of Zagreb have been carefully elaborated, in which context great emphasis is placed on the candidates' initial research interests, their planned research area and their perception of the development of their research career. The makeup of students at the doctoral programme in information and communication sciences at the University of Zagreb indicates that they may be grouped in two categories, depending on whether their theoretical groundwork is rooted in natural/technical sciences or social sciences/humanities. Such a broad foundation needs to be integrated into the candidates' research, which at the same time has to offer possibilities for further profiling their career, not only within the scope of their research or in relation to institutions funding it, but also in the sense in which research issues and challenges have to be responded to through the implementation of an interdisciplinary oriented research methodology. It also soon became clear that such a broad research area, at the same time lacking a precisely defined subject of research, requires a carefully thought-out system of supervision, as well as a wide selection of supervisors. A high-quality system of supervision therefore makes the backbone of the programme, and, owing to the fact that it is realised in cooperation with other faculties of the Zagreb university (e.g. Croatian Studies Department, Faculty of Political Science), institutions employing or funding PhD students (libraries, archives, museums) and specialists and researchers from other academic institutions, the programme offers an extensive and varied selection of supervisors, which, apart from those specialising in the field of information and communication sciences, includes specialists in all fields covered by 19 doctoral programmes at the University of Zagreb. Such a

large and diverse selection of supervisors best epitomises the already mentioned interdisciplinarity as one of the key features doctoral programmes should be characterised by according to the Salzburg principles.

The Zagreb doctoral programme in information and communication sciences has thus become a place bringing forth new generations of researchers, as well as a place of constant professional advancement of the programme's supervisors, whose academic excellence represents the programme's very core and has so far bred many PhDs who are today part of the faculty at many universities in the region.

At the very beginning of the programme, the doctoral students are assigned a counsellor, who helps them to devise their research strategy. At a later stage, they are assigned a research supervisor, and the responsibilities of both the doctoral candidate and their supervisor are defined by special regulations.
The programme's structural framework has particularly been influenced by the 8th Salzburg Principle, which emphasises the need for the development of transferable skills. These skills are the subject of one of the programme's modules and it will be described in greater detail in the next chapter.

4. The reformed doctoral programme in information and communication sciences at the University of Zagreb: thematic focus and organisational aspects

The harmonisation of the doctoral programme in information and communication sciences at the University of Zagreb with the Salzburg Principles was supposed to start from defining its research orientation and profile in relation to the research strategy of the Faculty of Humanities and Social Sciences (where the programme is conducted), which proved a considerable challenge, since such strategy did not exist at the time[2]. Thus, strategic documents used for this purpose instead were those of the University, along with EU documents setting out guidelines on doctoral education (European Commission, 2005; European Commission, 2010; Kottmann & Weyer, 2013). Also used as the starting point in this context were the results of the conducted SWOT analysis and the analysis of the global developments in the field of information and communication sciences, and social sciences in general (Odsjek za informacijske i komunikacijske znanosti, 2014).

The programme's unique research profile is grounded in several strategic fields within which the programme's supervisors guide the candidates in researching internationally relevant themes, thus increasing the candidates' prospects for actively engaging in the international academic and research network. These fields are: 1) information practices and knowledge in the digital environment, 2) digital documents and records as reliable sources, 3) digital linguistics and language- and speech-oriented research, 4) social relevance of cultural heritage

[2] The Faculty drew up its research strategy in 2018.

in the 21st century, 5) the challenges of the codification, exchange and creation of knowledge, and 6) the conceptual, methodological and social characteristics of modern mass communication.

The focusing of the programme's research profile in a field such as information and communication sciences proved a real challenge, not only due to interdisciplinarity, but also owing to different interpretations of the field's very subject and the belonging of that subject to other scientific fields and disciplines, which was all further complicated by the field's broadening through the inclusion in it of the communication component. The first step was to depart from any kind of strict institutional orientation (e.g. focusing the programme on libraries, archives, museums, schools, etc.), which was central to the previous programme, and to shift the focus towards information, media, and the related information and communication practices (Larivière et al, 2012). The programme's content therefore focuses on research into interactions between people, data/information/media content, digital technologies and society, as well as on the conceptualisation and development of the contemporary information and media systems enabling such interactions. The results of such research contribute to the development of the potential for efficiently and purposefully managing, using and communicating data, information and media content on the individual and organisational levels (heritage and public sectors, economy), as well as on the global level.

Grounding the programme on the EU doctoral education guidelines spotlighting a research- and research training-oriented approach, interdisciplinarity, and transferable skills, implied a significant shift in its structure, from linear to modular. The programme is thus structured into four compulsory modules, i.e. theory, methodology, research, and transferable/generic skills, of which each consists of compulsory and elective elements. In the first year, under the guidance of their counsellor, the candidates take theory- and methodology-oriented courses, which prepare them for conducting academic research. In the second year, they choose their research topic, either independently or with the help of the counsellor. During these two years, apart from earning credits for successfully completing courses taken as part of the theory- and methodology-oriented modules, the candidates also accumulate credits for various research activities, such as attending research-oriented seminars, developing their personal research strategy and research career plan, research work with their counsellor, participating in conferences, assisting in teaching graduate courses, attending workshops aimed at the improvement of generic and transferable competences, spending terms at foreign universities, etc.

The programme's theory module was by far the most difficult to structure, owing to the already mentioned theoretical dispersion characterising the field of information and communication sciences. It now offers both theory- and research-oriented mandatory courses which are either field- or discipline-oriented, as well as elective theoretical courses covering the candidate's

research topic, such as Epistemology of Social Sciences, Philosophy of Science, Theory of Information Sciences, Theory of Media and Media Content, Theory of Mass Communication, Heritage and Development, Information and Communication Theory.

The methodology module consists of courses in overall research methodology, scientific methods, and research procedures. As a result of shifting its focus towards research activity, more methodology-oriented courses and workshops have been introduced into the programme, in which context the candidates may choose general methodology courses (Methodology in Social Sciences; Research Methodology in Information Sciences), which are evenly complemented by courses and workshops presenting different qualitative, quantitative and mixed methodological approaches, which evenness is indispensable in such a broad and interdisciplinary research field.

The research module consists of seminars thematising various research topics in line with the programme's research strategy, of which the candidates choose those related to their dissertation topic.

The transferable/generic skills module is organised as a series of workshops aimed at the development of research, but also communication, management and business skills, which should enable the doctoral candidates to fully use their academic potential, both during and after the doctoral programme, and apply them in various professional contexts. This module is structured into two parts: academic and business-organisational. The latter focuses on transferring and applying creative problem solving skills acquired as a result of completing the programme outside the narrow academic scope, and thus offers content relating to project management and entrepreneurship (e.g. attracting funding, launching start-ups, business strategy tools, human resources management, teamwork, presentation and communication skills, etc)[3] ().

The programme puts particular emphasis on the doctoral candidates' academic and research agility by systematically prompting them to be active in this context. Thus, it co-funds their participation in international scientific

[3] Examples of workshops offered as part of the academic skills unit of the methodology module: 1. Peer reviews and peer review process; 2. Academic integrity; 3. Finding scientific information (through traditional academic communication mechanisms and alternative models of following scientific output (e.g. ResearchGate); 4. Publishing your research; 5. The popularisation of science (building online identity and strategically networking for the purpose of developing, maintaining and using research networks through applying multimedia presentation methods and tools, etc.)

Examples of workshops offered as part of the business-organisational skills unit of the methodology module: 1. Project management; 2. Entrepreneurship in the academic environment; 3. Presentation and communication skills, public speaking; 4. Professional development (time management, information organisation and management tools).

conferences and offers professional development opportunities by organising terms at prominent academic and scientific institutions abroad. Some of the academic activities co-organised by the programme are the European Conference on Information Literacy (ECIL), the Future of Information Sciences (INFuture) conference, and ITMed Summer School. Papers presented at these conferences are published and represent a significant platform for the dissemination of research results in the field.

A large majority of the candidates take part in the programme's summer schools, which are organised with the principal aim of strengthening the candidates' academic and research capacities and offering a platform where they, the faculty, national and foreign experts, the programme's alumni, various collaborators and guests may exchange ideas and experiences related to successfully overcoming challenges and using various possibilities on the path to earning a doctoral degree and launching a bright research career. The range of specialists taking part in the summer school, as well as in special doctoral seminars, where the candidates present their research interests and activities throughout the academic year, reflects the central feature of the Zagreb doctoral programme in information sciences, i.e. the conceptual integration of the information, communication and media fields through technology and new channels and models of communication in science. Thus the summer school and doctoral seminars focuse on the new information and communication platforms, as well as on the convergence of information and media areas owing to which information and communication specialists and scholars in the field are faced with challenges in the same semantic range, which implies that they can only be resolved through the application of an interdisciplinary and joint approach, giving rise to new dynamic research areas that young doctoral candidates may be directed towards.

The doctoral summer school and doctoral seminars have proved to be stimulating for the candidates' main research, since such encounters and exchanges help them to modify or reshape the thematic or methodological focus of their dissertation. Also, such occasions have proved equally stimulating for the field specialists, since they give them the opportunity to get acquainted with perspectives and approaches of young researchers. Such interactions enable efficient networking and provide the starting point for developing future research networks making possible the realisation of scientific insights through their practical application.

5. Conclusion

The reform of doctoral education is a complex process that has been reshaping PhD programmes in the European Union in all scientific fields during the last decade. One would expect that introducing these reforms will be easy and less challenging in fields whose very nature corresponds to the contemporary principles of doctoral education, as is the case with information and communication sciences, which are marked by interdisciplinarity, which is at

the same time advocated as one of the key principles of doctoral education according to all the contemporary guidelines. However, it turned out that this marked interdisciplinarity, owing to its direct connection to difficulties in defining the range and reach of the field's very subject or its related theoretical scope, poses particularly great challenges in the structuring of educational programmes, especially on the postgraduate level.

Since doctoral education is based on the scientific and research identity of a given field, the paper analysed the theoretical dilemmas that provided the conceptual groundwork for the present, reformed, doctoral programme in information and communication sciences at the University of Zagreb. The paper also analysed the intellectual and theoretical dispersion characterising information sciences, whose impact on the programme's structural reform manifested through the need to overcome traditional polarisations still present in the field (users vs. technology, qualitative vs. quantitative methodology, orientation towards institutions vs. orientation towards information practices, and the like).

The reformed doctoral programme bridges the gap between these opposing points of reference through a modular approach not limited by thematically fixed content as the programme's core, but making its focus the diversity of perspectives and approaches which it presents to the candidates. Such a model is compatible with the EU guidelines on doctoral education highlighting individualised approach, while the programme's modular structure enables the candidates to actively co-create the programme and choose their own path as a researcher, based on their specific research interests and inclinations.

The purpose of this paper was to prompt further debate on doctoral education in the field of information (and communication) sciences which, as it was already stated in the paper, has rarely been analysed. In this context, we hope that the specific analysis provided in the paper will contribute to increasing insight into the evolution of doctoral education in this field, as well as into its conceptualisation, structuring and sustainability in a field as dynamic as information and communication sciences.

References:

Bawden, D., (2008). Smoother pebbles and the shoulders of giants: The developing foundations of information science. *Journal of Information science*, Vol. 34, No. 4, p. 415-426.

Borgman, C. L., Rice, R. E., (1992). The convergence of Information Science and Communication: A bibliometric analysis. *Journal of the American Society for Information Science*, Vol. 43, No. 6, p. 397-411.

Druin, A., Jaeger, P. T., Golbeck, J., Fleischmann, K. R., Lin, J., Qu, Y.,Wang, P., Xie, B., (2009). The Maryland modular method: An approach to doctoral education in information studies. *Journal of Education for Library and Information Science*, Vol. 50, No. 4, p. 293-301.

European Commission, (2003). *Realising the European Higher Education Area. Communiqué of the Conference of Ministers responsible for Higher Education, in Berlin on 19 September 2003*, Access date 02.02.2019. Available at URL: https://enqa.eu/wp-content/uploads/2013/03/BerlinCommunique1.pdf

European Commission, (2005). *Bologna Seminar on "Doctoral Programmes for the European Knowledge Society": Conclusions and recommendations*, Access date 02.02.2019. Available at URL: https://eua.eu/downloads/publications/salzburg%20recommendations%202005.pdf

European University Association, (2010). *Salzburg II Recommendations*, Access date 02.02.2019. Available at URL: https://eua.eu/downloads/publications/salzburg%20ii%20recommendations%202010.pdf

Ferlindeš, J., Špiranec, S., (2018). Teorijsko-filozofsko utemeljenje knjižnične i informacijske znanosti u filozofiji informacije. *Vjesnik bibliotekara Hrvatske*, Vol. 61, No. 1, p. 37-56. [in Croatian]

Kent State University. Ph.D. in Information and Communication. Access date: 02.02.2019. Available at URL: https://www.kent.edu/iSchool/phd-communication-information-2

Kottmann, A., Weyer, E., (2013). Exploration of the implementation of the principles for innovative doctoral training in Europe: final report. Access date 02.02.2019. Available at URL: http://doc.utwente.nl/88802/

Larivière, V., Sugimoto, C. R., Cronin, B., (2012). A bibliometric chronicling of library and information science's first hundred years. *Journal of the American Society for Information Science and Technology*, Vol. 63, No. 5, p. 997-1016.

Nacionalno vijeće za znanost, (2009, 2012, 2013). Pravilnik o znanstvenim i umjetničkim područjima, poljima i granama. *Narodne novine*, 118/09, 82/12, 32/13//Vol. 118, No. 9; Vol. 82, No. 12; Vol. 32, No. 13. Access date 02.02.2019. Available at URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2009_09_118_2929.html, https://narodne-novine.nn.hr/clanci/sluzbeni/2012_07_82_1917.html, https://narodne-novine.nn.hr/clanci/sluzbeni/2013_03_32_574.html [in Croatian]

Robinson, L., Karamuftuoglu, M., (2010). The nature of information science: changing models. *Information Research: An International Electronic Journal*, Vol. 15, No. 4, p. 4.

Odsjek za informacijske i komunikacijske znanosti, (2014). *Strategija doktorskog studija Informacijske i komunikacijske znanosti 2015. – 2020.*, Access date 02.02.2019. Available at URL: https://inf.ffzg.unizg.hr/images/idundjer/pds/strateg/Strategija-2015-2020.docx [in Croatian]

Rutgers School of Information and Communication. Ph.D. in Communication, Information & Media. Access date: 02.02.2019. Available at URL: https://comminfo.rutgers.edu/academics/graduate/phd-program-communication-information-and-media

Sugimoto, C. R., Russell, T. G., Grant, S., (2009). Library and information science doctoral education: The landscape from 1930-2007. *Journal of Education for Library and Information Science*, Vol. 50, No. 3, p. 190-202.

Težak, B., (1969). Informaciono-dokumentaciono-komunikacioni (INDOK) sistem. *Informatologia Yugoslavica*, Vol. 1, No. 1/4, p. 1-2. [in Croatian]

UCD School of Information and Communication Studies doctoral programme. Access date: 02.02.2019. Available at URL: https://www.ucd.ie/ics/study/phdresearchprogrammes/

Zins, C., (2007a). Conceptions of Information Sciences. *Journal of the American Society for Information Science and Technology*, Vol. 58, No. 3, p. 335-350.

Zins, C., (2007b). Conceptual Approaches to Defining Data, Information, and Knowledge. *Journal of the American Society for Information Science and Technology*, Vol. 58, No. 4, p. 479-493.
Zins, C., (2007c). Knowledge Map of Information Science. *Journal of the American Society for Information Science and Technology*, Vol. 58, No. 4, p. 526-535.
Zins, C., (2007d). Classification schemes of information science: Twentyeight scholars map the field. *Journal of the American Society for Information Science and Technology*, Vol. 58, No. 5, p. 645-672.