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COOKING STONE SOUP: "POROUS" WORKFORCE TRAINING AT THE CZECH NATIONAL LIBRARY OF TECHNOLOGY AS A SUPPLEMENT TO (IMPERMEABLE) UNIVERSITY EDUCATION

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Abstract

As in many other countries around the world, STEM (science, technology, engineering, and mathematics) libraries in the Czech Republic are facing the difficult challenge of meeting the rapidly-evolving service needs of the communities they support in an environment in which the current university educational system does not provide graduates—neither those from STEM subjects nor those graduating from Czech library/information professional schools—with the appropriate set of skills needed for working in today's specialized information provision settings. As a result, the Czech National Library of Technology (NTK) has been forced to provide on-the-job workforce training since early 2015 to its reference, instructional, and front-lines services staff simply in order to keep pace with STEM library developments outside the Czech Republic. This weekly workforce training effort, christened NTKu (short for NTK*you*niversity), does not resemble traditional university education with its rigid structures and focus on the attainment of a degree. NTKu is, instead, porous: traditional "impermeable," less flexible university curricula are supplemented with on-demand, ever-changing targeted instruction on specific issues, topics, and skills applied immediately to real-work settings. This manner of instruction, as the authors discuss in the paper, can yield highly effective results; however, unique challenges can emerge in an instructional environment lacking traditional measures of effectiveness (i.e., grades) and requiring voluntary participation by both learners and instructors. Such porous instructional efforts resemble those of open source software (OSS) communities, in which voluntary effort can produce results benefiting a particularly community—but only to the degree of investment provided by contributors. Such initiatives resemble cooking stone soup: the results can be tasty, but everyone involved needs to bring something to the table.

Keywords
library workforce training, Czech Republic, information science, higher education

I. Introduction

"Do not believe in Utopian projects, except in those you are creating yourself."
Advice for the Young Writer, Danilo Kiš

This paper is a case study describing a particular response to staff training at the National Library of Technology in Prague. These efforts have been designed specifically for library reference, instructional, and front-lines services staff—members of an interdisciplinary team which has been systematically re-built between 2013-2016—who interact with scholars and students on a science, technology, and engineering campus. The authors place the training program in context, outline the theoretical and applied aspects of its curricular design, discuss the concept of *porosity* in this setting, provide an analysis of opportunities for refinement of the program, and consider possibilities for its future extension.

1.1 Context

Information service professionals working in Czech libraries which serve STEM fields, regardless of their educational backgrounds, often find themselves caught between a rock and a hard place—their formal educations often leave gaps in relation to the necessities of the today's ever-evolving networked information economy, characteristics of which are carefully described by Benkler (2006).

The CR tertiary education system is a pre-network era creation; its structures and governing mechanisms are inherently inflexible despite ongoing reform efforts (a full analysis is beyond the scope of this paper; national education strategies through 2020 are outlined by the Ministry of Education, Youth, and Sports 2014). Most challenging in terms of curricular reform and the creation of new interdisciplinary programs, essential to the information-related professions for reasons we will briefly deal with in Section 2 below, is a bottleneck created by a shortage of full professors, the presence of which is essential for accreditation of any new study programs (Ministry of Education, Youth, and Sports, 2009, pp. 25-27; Cejpek [2004] touched on this area in relation to information and library science in the CR).

Programs with logical affiliation to the information-related professions, such as the Czech Technical University in Prague's Faculty of Information Technology (FIT), do not have easy pathways for seeding new, accredited, interdisciplinary programs which cross the boundaries of engineering, natural science, humanities, and social science—any degree program must currently fit neatly into a particular department, and the concepts of complementary dual degrees (beyond Erasmus Mundus; see e.g., Charles University, 2016) or alternative admission paths (i.e., humanities or continuing education students entering a modified version of an engineering program tailored towards specific marketplace needs) are virtually non-existent at present (Araújo & Malecek, 2015).

Additionally, pressures for tertiary reform related to external changes are perhaps lower than in other countries due to the fact that the CR currently enjoys nearly full employment; as of February 2016, national unemployment measured 4.5%—second only to Germany in Europe, which recorded 4.3% unemployment for the same period (Eurostat 2016). Czech university graduates, regardless of their academic background, move fairly easily into post-graduation employment in the country's two largest sectors of employment: business services and the public/social services, with wages in the former being significantly higher than the latter (Araújo & Malecek, 2015; see Richter, 2014, p.172 regarding public sector library salaries).

What this structural context means in the specific case of our library's competencies for services staff (salary- and incentive-related issues aside) is the following:

- If these staff begin their library careers holding a degree in the humanities or social sciences, or graduated from one the three tertiary-level library/information (LIS) programs available in the CR, they find themselves ill-equipped for the complex efforts involved in fostering relationships with working scientists, engineers, and other researchers. They find themselves confronting a sea of information resources in a variety of formats—often requiring advanced knowledge of specialized English for their proper utilization—and at least some conception of quantitative and qualitative research approaches, not to mention project management, basic web engineering/programming skills, and leadership qualities, none of which are sufficiently addressed in existing LIS university curricula and most academic humanities/social sciences study tracks.

- If staff received a degree in a STEM field terminating at the Master of Science (Ing.) level, they may never have previously been forced to use research databases and tools *across* disciplinary boundaries, having been trained in specialized areas. Staff with highly narrow scientific and engineering backgrounds may never have received training in providing customer service, defining user-centered project requirements/schedules, or managing and leading people. Web engineering/programming skills are also not necessarily included in some

> science and engineering programs, with the obvious exceptions of informatics, cheminformatics, electrical engineering, and other computer science programs.

This situation will sound familiar to this audience. Münch (2014) describes a similar environment in Germany via interviews with developers of a new Master of Science in Library Informatics program at the Wildau Institute of Technology. In this paper, however, we do not wish to rehash debates about what constitutes an appropriate (L)IS university-based curriculum, beyond mentioning that we have utilize selected topics from modern information school (iSchool) curricula in relation to our own specific workforce training program. Readers interested in the development of information schools reengineered as a reaction to the demands posed by the emergence of the networked information economy, see notably Olson & Grudin (2009) and Olson & Olson (1998).

Here, we take a broader look at the issues by examining the core skills needed for our workforce in both the near- and long-term, taking an agile, backward design approach intended to be flexible and responsive to the needs of the networked information economy. For this, the literature regarding engineering education reform is particularly useful—if we, in our specific library's example, serve engineering faculty and students as the largest segment of our patron base, should not our staff be similarly prepared for 2020 and beyond?

This approach enables us to radically break away from rigid tertiary education concepts developed in the pre-networked era and allows us to envision and implement a completely flexible and responsive training program which interacts with external economic and scientific developments as they arise; this is a *porous* approach, inherently different to a canonical one—the curriculum "breathes" in response to external developments and concurrently enables staff to influence training topics from week-to-week based on the necessities of the workplace, over unbounded timeframes (i.e., topics do not need to unfold over a traditional semester calendar).

This is entirely possible and achievable in a workplace setting in which accredited degrees must not necessarily be granted (although they eventually could be; see Section 3.2.3) and where assessment mechanisms can also be tuned to day-to-day realities; for example, completion of a project can replace a traditional grade and be evaluated as part of an annual performance review.

2. Backward Curriculum Design: An Eye towards Engineering 2020 Competencies (& beyond)

Though over a decade old, the (United States) National Academy of Engineering (NAE)'s *Committee on the Engineer of 2020* report (2004, p. 1) provides a concise definition of the core qualities the engineering graduate of 2020 should possess, regardless of specialization; this concept is sufficiently broad enough to embody the ideal training state for alumni of our workforce initiative when the term *graduates* is replaced with *staff*: "technically grounded graduates [*(staff)* should] be better prepared to work in a constantly changing global economy." While we are training employees for specific near-term needs at our library, we purposefully want and encourage staff to be prepared for any position they may have in the future, even beyond library walls.

This essential and often overlooked investment in workforce preparation, particularly in the areas of project management, leadership and management skills as we discuss later in this section, involves relatively little investment beyond devoted in-house trainers, but it can have potentially huge payoffs by creating a service environment which can, just like the networked economy itself, shift and move dynamically along with the needs of its patrons. This is how the commercial technology sector operates, but there is no reason the non-commercial sector and libraries cannot be similarly inventive and responsive; in fact, we may be better positioned for this because stable basic funding can be used as a kind of venture capital, shifting and moving to projects targeted at specific needs (Bowen, 1999). It is perhaps our failure to be visionary managers and responsible, cost-effective public servants when we do not view our organizations in this manner; many of the challenges in libraries today, particularly our ability to provide flexible and effective responses technology-related issues, have been created by our own limited views of what role libraries might play in the networked global economy, focusing

instead on quotidian issues (Anderson, 2015). Taking a broader perspective, we can shift our role as library managers into mentors for flexible teams of information professionals who care passionately about providing amazing services to our patrons—services we provide now and those we can only presently imagine.

But what does it mean, preparing staff to work within the context of a constantly changing global economy? Specific attributes of the broad core statement provided by the NAE report include: the ability to work in multidisciplinary teams, the ability to communicate between technical and public audiences, and an understanding of the complexities associated with the networked environment worldwide; "[f]lexibility, receptiveness to change, and mutual respect are essential as well." (NAE, 2005, p. 10)

Starting with these general, responsive frameworks instead of heavily-structured, inflexible curricular models means specific instructional areas can be quickly and easily added, modified, and revised while drawing upon various multidisciplinary sources as technologies change.

Staff participating in our particular program, NTK*you*niversity (NTKu) can currently have any disciplinary background because the CR does not, as of the date of publication of this paper, require any particular degree for library employment; in our case, we view this to be advantageous, because it encourages staff with different perspectives to enter the library environment. The only current prerequisite for participation in our weekly one-hour training programs by our services staff is the ability to read and understand English at the B1 level, because Czech language materials do not yet exist for many areas of study and because the majority of electronic resources used by our patrons are currently in English. Languages of course instruction include both Czech and English.

As noted above, one must know English even in order to understand coverage and content of many of the materials we provide to patrons in the STEM fields and the authors of this paper do not intend this choice to be "colonial" in nature (Appadurai, 2003; Walker, 2009); this language choice is only a manifestation of the particular environment in which we work and serve, a small country where the publishing industry does not have the capacity to conduct wide scale translation of scientific and engineering publications. If the worldwide language of scientific communication were to change in the future, we would need to respond to understanding of any potential language in a similar manner.

The following Table 1 illustrates how we have mapped the NAE core competencies to our specific needs. We do not have space within this paper to list all weekly topics of instruction to date, so will only discuss selected topics in relation to illustrating unique aspects of potential interest to library administrators as well as lessons learned to date.

If you are interested in gaining access to our course materials, please contact the paper's authors and we will provide you with access to our learning environment (an open source iteration of Moodle). In the future, we would like to make our course materials fully available to the public; we have not been able to do that to date because of staff limitations in relation to ensuring copyright restrictions are respected for course content—we are a small team, and do not yet have the capacity to vet copyright issues while concurrently developing programs. Ideally, it would be interesting to make a peer-produced/curated and fully-open instructional tool available to anyone worldwide—not a fee-based massive online open course (MOCC), but a kind of open source community resource available to anyone interested. Such an approach would encourage collaboration, innovation, and participation in the networked economy in a democratic manner as is exhibited in the most creative and successful non-profit online initiatives (Benkler, 2006; Lakhani, 2007).

The core competencies illustrated in Table 1 below are only a sub-segment of a more granular list of competencies which we have developed as a tool for staff against which they can measure their own performance over the long-term. Course instructors meet with staff individually twice a year to discuss their individual learning plans and educational progress. Again because of space limitations, we do not

provide the complete list of competencies in this paper, but can provide it to those interested upon demand.

Core Competency	Disciplinary Origins	Notes
Technical grounding – emphasis on information/computer science	iSchool curricula, computer science curricula; at present for NTK, especially: • Networking concepts • Human-computer interaction • Database design fundamentals • Basics of information retrieval, representation • Fundamentals of web engineering	Ongoing for duration of employment at NTK; weekly one-hour classroom instruction supplemented with: • Freely-available online instructional modules • Webinars • Open courses • Reading (pre-existing English textbooks) Could be, with higher funding levels, extended to include: • Enrollment in selected, complementary MOCC offerings; this is currently prohibitively expensive because of currency conversion issues • Enrollment in existing tertiary courses (at present difficult because of admissions procedures designed for full-time learners)
Multidisciplinary teamwork	Engineering design-built-test frameworks (National Academy of Engineers, 2015, pp. 42, 53)	Requires hiring staff with different academic backgrounds, increasing in STEM disciplines (see Appendix 1) Enforced with assignment of project-based work
Flexibility and receptiveness to change	Management literature	Lectures drawn from sources as in technical grounding above, supplemented with practical working assignments
Mutual respect	Professional standards and ethics –Association of College & Research Library (ACRL) standards; management literature	Lectures drawn from sources as in technical grounding above, supplemented with practical working assignments and, in the future, international exchange programs
Leadership	Management literature	Lectures as above supplemented by purposeful assignment to leadership tasks; assigning mentoring responsibilities for new services staff
Customer service/fundamentals of consultancy and communication	Management literature, communications, and legal literature	Lectures as above supplemented by daily work with public and future pro-active liaison responsibilities

Table 1: Core NAE Competencies Applied to the NTK Setting

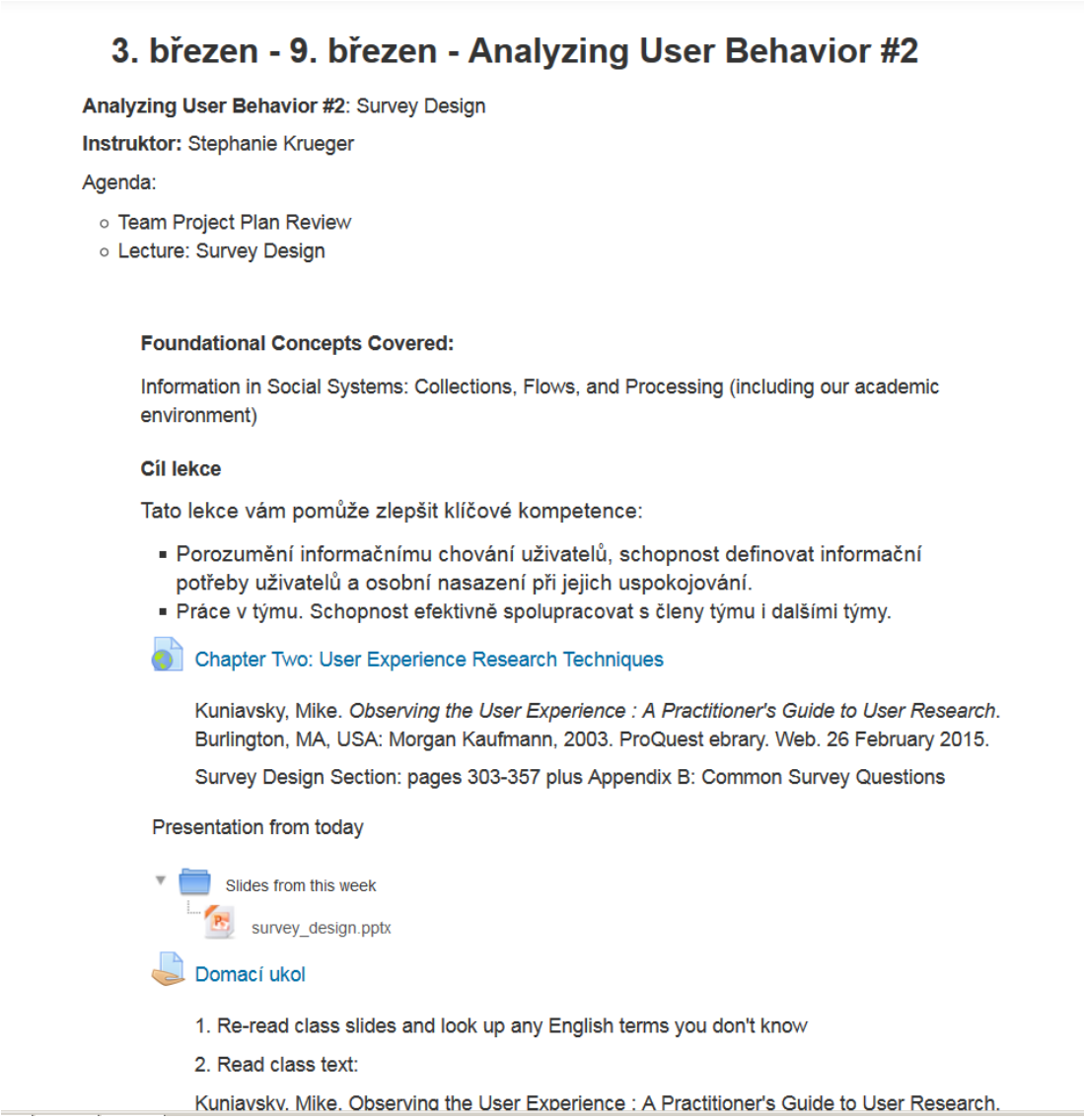

Figure 1: Sample Weekly Course Module, 03.2015

At every turn, our program necessarily involves a combination of theory and practice (for a history of cooperative education approaches in engineering, see NAE, 2005, pp. 63-66). We use real-life examples for points of discussion; we integrate projects which need completion in the library as course homework assignments. We even supplement the weekly course with a weekly discussion forum, in which course attendees discuss complicated inquiries and issues in a freeform, unmediated manner.

3. Interesting Aspects of the Course for Library Administrators

Below, the authors highlight unique aspects of the course for library managers interested in creating similar programs.

3.1 Embracing Ambiguity

Part of the porous approach involves considering feedback from the participants throughout the program. Course instructors in such an environment must be able to integrate feedback but concurrently remember the core competencies they wish to develop. In doing this, instructors must be able to accept and integrate a certain level of ambiguity into the program. We will illustrate this here with the example of electronic resource/tool training at our library—something our staff commonly demand. Our response, however, is different than in traditional training programs.

Specific, in-depth training on particular electronic resources and tools takes place separately from our weekly courses, except when instructors must explain particular features or aspects in relation to a course topic. Instructors expect participants in the course to learn about these resources on their own and emphasize this is a characteristic responsibility for any information professional. A small team of NTKu participants schedules group training independently as needed for all service staff as an ongoing multidisciplinary team assignment. This assigned project required staff to exhibit leadership—i.e., instructors did not provide course participants with a list of required tools they must learn, although they could easily have done so. In other words, instead of a top-down managerial decree, course participants implemented a bottom-up grassroots response to an ambiguous problem.

This is an example of how our program resembles cooking stone soup: course instructors place a metaphorical stone into the cooking pot and staff are given responsibility for creating a tasty final product—the end results as a whole will only be as good as the sum of team contributions to the effort.

For those unfamiliar with the European folk tale, a brief recap: some travelers (here, NTKu course instructors) come into a village (the workplace), carrying only a large kettle. After arriving in the village, the travelers get some water, start a fire, and place the pot over the fire to boil, throwing in a stone. The villagers, becoming curious, ask the travelers what they are doing. “Mmmm,” the travelers reply, “we’re cooking a tasty soup for everybody. If only we had a few more ingredients.” The travelers try to pique the curiosity of every villager passing by. One-by-one, the villagers drop new ingredients to the soup. And in the end, the result is tasty.

Helmert, et al. (2011) apply this tale to the concept of collaborative planning algorithms; here, the key takeaway from the story for library administrators in relation to our program: course instructors (i.e., managers) do not prescribe the specific recipe for an ideal output; course participants (i.e., staff) are encouraged to invent their own creations, as tasty only as to their level of engagement in the final product. Why? In our specific case, our library requires flexible, creative staff members who are encouraged to solve service problems—whatever they may be—on their own in a professional manner with their other team members, instead of requiring continuous upper-level managerial intervention. Giving staff ambiguous workplace assignments instead of prescribed solutions achieves this. Managers, with well-trained and well-functioning teams behind them, are therefore freed from day-to-day prescription of specific work tasks and shift their role to that of leaders and advisors—those who inspire others to be creative instead of being task masters. Employees shift their role from simply following orders to becoming actively engaged professionals who care about the outcomes of their work and who feel they have volition in relation to their professional activities.

3.2 Building Competencies in Layers

A program such as our builds itself up dynamically around the core competencies, creating various layers of conceptual meaning around each area of competency. But at the same time, three broader layers (or stages) of general competency operate. With such a porous curriculum, course participants must: 1) be willing to participate, because there are no authoritative control mechanisms such as grades, and 2) be curious and engaged. Finally, in an ideal future state, 3) the weekly program in its current form would disappear. Competent, well-trained and thoughtful staff would no longer require weekly instruction, themselves being continuous learners able to provide instruction to new team members and, in the future, be able to provide creative solutions to new problems as they arise and

anticipating development of new service offerings in the long-term tie horizon. Because of space limitations, we only touch briefly on each of these general layers below.

3.2.1 First Layer: A Team Willing to Learn

Some villages, regardless of how enticing the tales of the wandering travelers may be, might simply not be interested in cooking soup. In these cases, there is no point for the travelers in starting to cook because the results—regardless of the intensity or creativity in the travelers' efforts—would eternally be a stone boiled in water. In such cases, the travelers have two choices: 1) simply move on to a more hospitable village or, to put it somewhat harshly, 2) resettle the villagers and establish a new village, one which is interested in soup.

In the case of our library, we actually had to do the latter; the development of the course was accompanied by a concurrent shift in our reference and instructional team (see Appendix 1 and Appendix 2). Why? Our STEM patrons and university partners require a nourishing and tasty soup, not boiled water—they can boil water on their own. Our library requires front-line services staff who can educate patrons about how to more effortless navigate potential academic information sources and tools in the STEM fields, and who understand the research lifecycle for students and scholars being trained for and participating in today's networked global economy. These are complex, highly tailored services that require the aforementioned professional competencies. In such case of a library such as ours, implementing such a program required paying attention to and creating a first layer: transitioning staff and building a new team. New course participants joined the course as they were hired in our specific case, because we could not wait for an ideal state in which course instruction in core competencies would begin for everyone at the same time.

Figure 2: NTK Reference Team, 2015

3.2.2 Second Layer: Inspiring Innovation by Building Confidence

One aspect of developing the aforementioned core competencies involves inspiring professionals at the beginning of their careers to be more confident. This involves demystifying aspects of technology, tools, and STEM academic culture—showing learners they have the capacity to deal with the complexities of the networked information economy. We do not need service team members who can program a perfect database—we have programmers to do that—but we do need staff who can identify a problem with a database or identify a gap in our service offerings and subsequently solve the problem by working with all relevant stakeholders, gathering the appropriate team members for a project, and then implementing and launching a solution.

At NTKu after one and a half years of instruction, we are currently somewhere in the middle of the second layer process. We have demystified many areas of technology in relation to information systems, exposing staff to vocabulary and concepts in a broad range of areas. Over the next year and a half we will build upon this foundation. One area of particular focus will be the concept of consultancy in relation to proactive, long-term patron relationship management. We need to view our services efforts as would a commercial startup who wishes to grow and maintain its client base (Matthews, 2012). Another area of emphasis will be on providing mentorship and leadership to staff who are not participants in the current program.

3.2.3 Third Layer: No Travelers Required

NTKu's two primary course instructors have backgrounds in information science, web engineering, educational theory, and over fifteen years each of academic technology development and service management experience. This is sufficient for instruction within the second layer when complemented by selected guest instructors for highly-specialized topics.

Our course instructors have an ideal goal state for the course: they envision a time at which course participants will be sufficiently able to understand core competencies to enable us to stop weekly instruction—to disband NTKu—and to let course participants "graduate" by becoming the leaders of the future. At this point, our graduates will not hold an advanced degree from an accredited university program, but they will be highly-skilled professionals able to decide what they feel is needed for training new team members as they come onboard, to monitor new trends and developments on their own, and to consider themselves to be independent professionals who can solve complex problems—to be the engineers of 2020, in a sense.

4 Conclusion

In this paper, we have described the conception and implementation of a workplace training initiative designed to be part of the network era—highly flexible, responsive, creative, and temporary in nature. NTKu is designed to be not an institutionalized program, but rather a responsive collaborative effort for training future leaders. While the concepts we describe could be adapted and integrated into traditional, less flexible university programs—perhaps extending them—and while we will investigate possibilities for this in the year ahead, the authors feel the porous nature of our program is particularly well-suited to training STEM service teams in libraries.

References

Anderson, R. (2015). A quiet culture war in research libraries – and what it means for librarians, researchers and publishers. *UKSG Insights, 28*(2), 21-27.doi: 10.1629/uksg.230/

Appadurai, A. (2003). Illusion of permanence: Interview with Arjun Appadurai. *Perspecta, 34*, 44-52. doi: 10.2307/1567314

Araújo, S. & Maleček, P. (2015). Strengthening skill use and school-to-work transitions in the Czech

Republic. *OECD Economics Department Working Papers, No. 1206*. Paris: OECD Publishing. doi: 10.1787/5js1pz2xnm6b-en

Benkler, Y. (2006). *The wealth of networks: How social production transforms markets and freedom*. New Haven: Yale University Press. Retrieved from http://cyber.law.harvard.edu/wealth_of_networks/Main_Page

Bowen, W. (1999). JSTOR and the economics of scholarly communication. *Journal of Library Administration, 26*(1-2), 27-44. doi: 10.1300/J111v26n01_05

Cejpek, J. (2004). Univerzitní obor "Informační studia a knihovnictví" zevnitř. *Národní knihovna knihovnická revue, 15*(1). Retrieved from http://full.nkp.cz/nkkr/Nkkr0401/0401020.html

Charles University (2016). *Joint degree – Multiple degree*. Retrieved from http://www.cuni.cz/UKEN-20.html

Eurostat (2016). *Euro area unemployment rate at 10.3%*. Retrieved from http://ec.europa.eu/eurostat/documents/2995521/7225076/3-04042016-BP-EN.pdf/e04dadf1-8c8b-4d9b-af51-bfc2d5ab8c4a

Helmert, M., Röger, G., Seipp, J., Karpas, E., Hoffmann, J., Keyder, E., & Westphal, M. (2011). Fast downward stone soup. *Seventh International Planning Competition*, 38-45. Retrieved from http://orff.uc3m.es/bitstream/handle/10016/11710/ipc2011-booklet.pdf?sequence=1#page=38

Lakhani, K. R. & Panetta, J. A. (2007). The principles of distributed innovation. *Innovations, 2*(3), 97-112. doi:10.1162/itgg.2007.2.3.97

Matthews, B. (2012). *Facing the future: Think like a startup*. Retrieved from https://vtechworks.lib.vt.edu/bitstream/handle/10919/18649/Think%20like%20a%20STARTUP.pdf?sequence=1&isAllowed=y

Ministry of Education, Youth, and Sports (2014). *Higher education in the Czech Republic 2008. Prague: Ministry of Education, Youth, and Sports*. Retrieved from http://www.msmt.cz/uploads/Areas_of_work/higher_education/Higher_Education_in_the_Czech_Republic_2008.pdf

Münch, V. (2014). Wir brauchen extrem viel Fort- und Weiterbildung. *b.i.t. online 17*(1). Retrieved from http://www.b-i-t-online.de/heft/2014-01-interview-seeliger.pdf

National Academy of Engineering (2005). *The engineer of 2020: Visions of engineering in the new century*. Retrieved from http://www.nap.edu/catalog/10999/the-engineer-of-2020-visions-of-engineering-in-the-new

Olson, G. M. & Grundin, J. (2009). The information school phenomenon. *interactions, 16*(2), 15-19. doi: 10.1145/1487632.1487636

Olson, G. M. & Olson, J. S. (1998). Two psychologists in search of a school of information: A personal journey. *Library Hi Tech, 16*(2), 85-89. doi: 10.1108/07378839810304496

Richter, V. (2014). The development of Czech libraries, 1990-2013. *Library Trends, 63*(2), 161-182. doi: 10.1353/lib.2014.0041

Walker, J. (2009). Time as the fourth dimension in the globalization of higher education. *The Journal of Higher Education, 80*(5), 483-509. doi: 10.2307/27750742

Appendix 1: Transition to Multidisciplinary Teams

Highest degree	Discipline for highest degree	Gender
MA	LIS	Female
MA	LIS	Female
MA	LIS	Female
MA	LIS	Female
MA	LIS	Male

Table 2: Disciplinary Background, NTK Reference Team, April 2013

Highest degree	Discipline	Gender
BA	LIS	Female
High school	Not applicable (n/a)	Female
High school	n/a	Female
MA	LIS	Female
MA	Social Work Studies	Female
MA	Comparative Literature	Female
MSc	Geodesy and Cartography	Female
MSc	Agronomy	Female
BSc	Environmental Science	Male
MA	Sociology	Male
MSc	Mechanical Engineering	Male
MSc	Hydrology	Male
PhD	Modern History	Male

Table 3: Disciplinary Background, NTK Reference Team, April 2016

Appendix 2: Average Ages of NTKu Reference Team, Rest of Library

	Average Age
Reference Team	31
The Rest of Library	44

Table 4: Average Ages of NTK Staff