

Letting Traditional Boundaries Blur: A Case Study in Co-Developing STEM “Excellence” Courses

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LETTING TRADITIONAL BOUNDARIES BLUR: A CASE STUDY IN CO-DEVELOPING STEM “EXCELLENCE” COURSES

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Abstract

This illustrative case study describes the evolution of a series of courses (2014-present) aimed at providing advanced students and early career researchers from a Czech science, technology, engineering, and mathematics (STEM) campus with the skills they need to adequately participate in global scientific endeavors. The involvement of library staff in the courses described here ranged far beyond embedding in the passive sense of the word, with all aspects of course design, implementation, and revision managed collaboratively and actively by an interdisciplinary, cross-institutional team championed by library personnel. Thus, this study raises the question of whether or not “embedding” is the appropriate term for describing active library leadership in such “catalytic” endeavors.

Structurally, the case study will linearly relate how course modules were developed and how the team approached various organizational and structural hurdles which emerged over time.

The study will also show how information literacy concepts were woven into the curriculum without being labeled as such—thus identifying a possible necessity for refining the discourse surrounding information literacy concepts so that students and researchers better understand why they are valuable.

The study includes original data from course evaluations as well as descriptions of final syllabi (topics covered, readings assigned, types of homework assigned) for two courses, *Scientific Writing in English*, and *Gaining Confidence in Presenting*. Because all instruction and materials were delivered in English, the content described will be relevant to anyone working with advanced STEM students and early career researchers who publish in English.

Finally, the study relates how such courses provide essential starting points for proactive engagement with patrons and includes examples of dialogues about writing, publishing, and related topics, introducing issues related to blur: the blurring of traditional boundaries between librarianship and scholarship.

Keywords

STEM education, Czech Republic, international competitiveness, doctoral education, doctoral experience

1 Introduction

This case study chronicles the evolution (2014-present) of organically-developed courses tailored specifically to increase the international competitiveness of doctoral and postdoctoral students, initially from the Czech Technical University in Prague (CTU), Faculty of Civil Engineering, Department of Mechanics. These efforts have recently been expanded and are open to advanced students from the University of Chemistry and Technology, Prague (UCT Prague), the Czech Academy of Sciences’ Institute of Organic Chemistry and Biochemistry (IOCB AR), and Charles University (CU).

The courses described here are organized and take place in the National Library of Technology (NTK) and were co-developed with professors from CTU’s Faculty of Civil Engineering, Department of Mechanics. The courses emphasize the cultivation of English language research, writing, and presentation skills in order to supplement and support subject-specific knowledge imparted by

primary mentors. In-class work is supplemented by on-demand individual consultations and editorial services provided by NTK staff.

1.1 Context

CTU's Faculty of Civil Engineering is the university's largest and oldest school, serving over 5,000 students annually with approximately 400 instructors and research staff (Kohoutková, 2016). In the most recent subject-specific QS university rankings, the faculty placed in the top 51-100 category (QS Quacquarelli Symonds Limited, 2017). The faculty embodies many aspects of a model engineering school and prides itself on its dynamism and ties to industry, stating its "graduates are traditionally in great demand in engineering practice as they possess a solid theoretical background, professional competencies, and developed creative abilities" (Kohoutková, n.d.).

The Department of Mechanics conducts research in the areas of engineering and structural mechanics, statics and dynamics of building structures, theory of elasticity and plasticity of materials, experimental analysis, fracture and damage mechanics, and computational mechanics (Líbenek, 2011).

The evolution of the collaboration with the library began with a chance encounter—the author of this paper conducted a tour of the library for students of a professor from this department in early 2013. Following the tour, plans were made to have coffee and discuss possible areas of collaboration. This first meeting happened over one year later.

1.2 Format Zero: September 2014

At their initial meeting, the three collaborators (two professors and the author) discussed joint goals for advanced student support and created outlines for three thirty-minute pilot workshops.

Initial goals of the collaborative team:

1. Reduce basic library/information resource teaching burden for [the professors] and [their] colleagues
2. Provide "QuickStart" to effectively using eResources, eBooks, and other materials provided by NTK and [CTU] and openly online - advanced skills for serious young scholars
3. Give an introduction to the scholarly publishing/research process/lifecycle
4. Determine what additional advanced instruction or services NTK might provide which are not available from the [CTU] library presently
5. Give students an opportunity to practice their research English - oral and written skills (S. Krueger, personal communication, Sept. 11, 2014).

Initial sketch for the three pilot workshops, including optional homework:

Workshop Title	Content	Optional Homework
Beyond Google: QuickStart to effectively using NTK and [CTU] resources	Includes remote access, special services for PhD students, building a good query in English	Write a one-page description of your research interests and prior experience with library/resources
The scholarly publishing/research universe: what you might not know yet & tools to help you	Includes overview of citation management options (open source and commercial - review your existing guide briefly at: http://en.wikipedia.org/wiki/Comparison_of_reference_management_software + AMS TeX resources, http://www.ams.org/publications/authors/tex/tex), new social tools like ResearchGate, Mendeley - advantages and disadvantages	Write a brief (one paragraph) description of articles you have already published or describing proposals for conferences to date, then write two one paragraph reviews discussing the advantages and disadvantages of ResearchGate versus Mendeley and Scopus versus Web of Science, respectively

	effectively using Scopus & Web of Science, critical thinking in relation to commercially-provided tools (pros & cons)	
Technical/professional writing for engineers: useful resources	Overview of useful specialized reference, material/product information and product design resources	Write a one-page review of your favorite print or electronic resource(s) for engineering - choose one or discuss several - not more than three favorites. What do you like and what drives you crazy?

Table 1: Initial Workshop Sketch (S. Krueger, personal communication, Sept. 11, 2014)

In evaluations of the pilot, when asked what might be improved, several participants emphasized writing, speaking, and publishing—and *more time*:

The main drawback is the limited time Stephanie was given. Depending on the number of attendees I would prefer more discussions to overcome [shyness] and to practice talking in general.

I would appreciate more intensive course about professional scientific writing. Maybe something about an hour to present our work in conferences.

I would appreciate more information about citation metrics.

Maybe more time for the course, it was quick quick. (S. Krueger, student evaluations, Jan. 9, 2015)

Participants' wish list for future courses:

Professional presentation skills, transferrable skills

Principles for writing good papers

How to write a paper: scientific writing in English (course). Presentation in English how to present at a conference (course).

I would generally appreciate more profound course on scientific writing.

Advanced course on scientific writing

Editing services, automated purchase/delivery of papers not available online (S. Krueger, student evaluations, Jan. 9, 2015)

The message sent in evaluations was loud and clear: the writing process would constitute the next stage of our efforts. Editorial services were launched immediately and plans were made for the launch of a writing and publishing course in late 2015. Complementary presentation courses followed, launching in 2016.

2 Scientific Writing in Practice: A Modest Proposal

Based on feedback from the initial sessions, the decision was made by the collaborative team to create a proposal for a semester-long writing in English course open to all CTU doctoral students, managed by the library and the Department of Mechanics.

While members of the collaborative team were aware of online massive online open courses (MOOCs) about scientific writing, we specifically wanted to create an in-classroom experience for advanced students, with small class sizes (limit: 20 participants) and the ability to facilitate discussion. We also wanted to be able to quickly adjust courses to local needs, with a particular emphasis on early doctoral students (Mantai, 2015).

The proposal targeted *excellence*—defined for this course as the ability of advanced students and researchers to publish in top international journals and to communicate their original research to others worldwide.

Another notable aspect of the initial concept was its emphasis on *neutrality*—providing skills transferrable to any publisher or scholarly publishing setting, unlike many courses provided by publishers which train students for specific publishing contexts.

Scientific Writing in Engineering
Course organized by NTK for Ph.D. students and researchers of CTU in Prague

Background/?Motivation?
The most direct way to improve the quality of research at CTU is to encourage Ph.D. students to publish in high-quality journals. The major weakness of our students – in comparison to students of the top rated universities – are their limited writing and presentation skills, due to the lack of experience and training during the undergraduate studies. This limitation is sometimes overcome during their Ph.D. training, at the expense of an ad-hoc, and rather time-consuming, involvement of their supervisors and/or junior and senior colleagues. The aim of this course is to provide the students (and CTU researchers) with a systematic and professional education in the area of scientific writing.

Audience
In the first stage: 3+ year Ph.D. students, junior and senior researchers; in the second stage: first- or second-year Ph.D. students

Preliminary course content¹

1. Essentials of grammar -- paragraph structure, word order, articles, punctuation etc.
2. How to organize the writing process
3. Title and abstract
4. Introduction
5. Materials and methods
6. Results and discussion
7. Conclusions
8. Citations, list of references, and acknowledgements
9. Submission process, reviewing for journals
10. Ethical issues of scientific writing

Figure 1: Initial proposal sketch (J. Zeman, personal communication, Dec. 12, 2014)

The proposal, in expanded form, was presented by the Department of Mechanics to CTU administrators and by the library services group to its leadership. There were some concerns regarding the blurring of traditional boundaries between the library and the academy as well as the long-term sustainability of the course (i.e., enough campus wide student interest). Despite this, the collaborative team pressed forward, unified by the urgent need to provide students from their department with systematic support in the areas identified in Figure 1 and exemplified by this recent evaluation comment:

I really appreciate what you have been doing here. It is very special and something I have been looking for a long time. The Czech academic environment lacks such sources. The situation has changed recently, I guess, yet there are many things to be done in the future (S. Krueger, student evaluation, Jan. 18, 2017).

Funding from CTU in the pilot phase was exclusively provided for a local English teacher on a contractual basis. A Fulbright visiting professor in Electrical Engineering was engaged as a volunteer expert to cover each topical area of the course (Figure 1). Each weekly session included one hour led by the Fulbright professor focused on his experiences as a writer, editor, and reviewer (NTK, 2016) followed by one hour of language instruction in difficulties typically encountered by non-native speakers of English. A pilot version of the course was launched in short-course form in November 2015 and was followed by three semester-long courses to date.

Starting in late 2016 (after the departure of the Fulbright professor), one professor and the English teacher took the lead on developing the syllabus. Moodle, hosted by the library, was employed as the course management system. The library continues to serve as project manager and coordinator of course activities. One of the professors serves as primary lead to all appropriate university parties and manages all organizational communications with course participants. Workload for the course is thus shared across the collaboration team.

Appendix A provides the current course syllabus and reading list. All reading materials still in print were purchased by the library with copies on permanent reserve.

This year the course, together with the supplementary courses described below, were opened to doctoral students and researchers from other institutions on a first come, first served basis, pending space available following registration by CTU students. The course was also approved by the Faculty of Civil Engineering as a for-credit elective doctoral course (Hájek, 2017).

3 Complementary Courses and Individual Consultations

3.1 Supplementary Presentation Courses

In response to a continued call in writing course evaluations for more time to speak and practice presentation skills, the library launched a semester-long *Gaining Confidence in Presenting* course targeted at writing course alumni in 2016 (initial syllabus, including homework assignments, in Appendix B). A second stage semester-long course, *Scientific Oral Presentations*, was launched in spring 2017. Both courses are presently non-credit. Class size in both cases is limited to 10 students.

A young researcher from the Department of Mechanics assisted in the initial development of *Gaining Confidence*, serving as a “usability tester” for the pilot concept prior to launch:

I think that the name ‘Gaining Confidence as a Presenter’ is perfect and could attract students to your course. As a brief description I would recommend to highlight the following (please excuse my English):

- techniques to help with presenting fluently will be presented (like the ones we discussed - not trying to remember everything and improvise, to avoid unfamiliar etc.),
- basic presentation mistakes will be discussed (such as going into detail, making the presentation boring for audience, having text instead of highlights in Power Point presentations etc.) (V. N., personal communication, Aug. 22, 2016)

The small workshops aim to foster within students a “sense of belonging” to a scientific community, enabling participants to discuss their academic motivations, achievements, and individual interests. Trujillo & Turner (2014) provide additional background on the topic of scientific belonging. In Moodle, these courses are purposefully categorized under the heading *Researcher/Student Success*.

Locally, many researchers refer to such supplementary courses as “soft skills” courses; however, the author increasingly agrees with the US National Academy of Engineering (NAE) that such skills are crucial to doctoral students, if our aim is to make them truly globally competitive, truly excellent:

Technical excellence is the essential attribute of engineering graduates, but those graduates should also possess team, communication, ethical reasoning, and societal and global contextual analysis skills as well as understand work strategies....[to produce] engineers able to communicate with the public, able to engage in a global engineering marketplace, or trained to be lifelong learners (National Academy of Engineering, 2005, p. 52).

Another way of referring to these competencies is the “development of self-sufficient individuals able to articulate and activate a vision and bring it to fruition” (National Academy of Engineering, 2005, p. 104).

For more recent discussions on related topics, the European Council of Doctoral Candidates and Junior Researchers (Eurodoc) provides newsletters addressing many of these issues (Eurodoc, 2012-2017).

3.2 Individual Consultations and Writing Center

Individual English writing consultation and editing services were launched in parallel with the initial writing workshops in 2015. To date, demand for these services has been strong and steady but not yet overwhelming.

Topic/Task	Number of Consultations (Jan 1 – June 6, 2017; in-person or virtual)
Editing, journal article	8
Admissions materials (postdoc positions, other applications)	20
Language testing preparation (TOEFL, IELTS)	5
Doctoral dissertation discussion	6
Career, life, diversity issues	9
Presentation editing	4
Other editing (titles, abstracts, essays, other)	26
Grant application editing	1
Translations, Czech to English	3
Traditional library reference (using resources, remote access, appropriate subject resources)	9
Total:	91

Table 2: S. Krueger Individual Consultations, 2017 (to June 6)

In order to anticipate future demand and to build capacity and depth of our writing, research, and teaching initiatives, a part-time staff member with a PhD in Neuroscience was hired by the library in early 2017. We will begin proactively promoting our writing center services later this year.

The author of this paper has, as an individual, joined the International Writing Centers Association (IWCA), upon recommendation from the Executive Director of the Texas A&M University Writing Center, with whom the author has been in touch regarding resource linking (University Writing Center, 2017) and collaboration.

For more background on writing centers and libraries, see Cooke & Bledsoe (2008), Elmborg & Hook (2005), Heller-Künz & Mayer (2016), Jackson (2016), James & Nowacek (2015), and O'Kelly et al. (2015).

In individual consultations with students, the author makes no distinction between in-person or virtual mentoring and has found the US National Academy of Sciences (NAS)' *Comments on Faculty Mentoring* document to be of utmost value (Stein, n.d.).

If our campus partners have support units for student life issues, the author does guide learners to existing support units. However, in certain areas (e.g., diversity issues), support units are not yet in place on our campus. The author is following the NAS mentoring guidelines when, for example, assisting international students impacted by geopolitical "schizophrenia" (Deleuze & Guattari, 1983).

4 Discussion

While the offerings described above were tailored to local needs and in response to local demands, the collaborations do encompass several areas of broader interest.

4.1 Flexibility Means Power

It may still be revolutionary to consider flexible, collaborative organizational structures within academic libraries, but our experience with these courses illustrates the very real power of agile staffing responses which enable us to respond quickly to what our patrons really need. Pilots can easily be created, implemented, and evaluated by committed staff members open to continual improvement. It is easy, particularly for non-credit courses, to modify course content format—and even stop courses if needed based on feedback and if staff are hired knowing their workload and course instructional palette will necessarily change over time. This, of course, requires a high level of frankness throughout the hiring process and in performance evaluation discussions. It also requires hiring practices which proactively seek out flexible, creative team members committed to academic excellence. For this, traditional full-time, traditional in-office work situations are perhaps limiting; in our case, flexibility in terms of working hours and combining with other obligations was more important to our recent new hires than salary alone.

Importantly, flexibility in our case comes with a concurrent sense of stability: our part-time team members are real employees with full benefits rather than adjuncts without employee protections. This “flexible stability” provides the right mix for us in recruiting staff interested in creating a life/work (or: multiple job) balance.

In terms of library instruction, our experience illustrates that courses taught by collaborative teams of experts can work, even when instructors are recruited on a volunteer/academic service basis—even remotely (Seadle, 2016). Our concept is to harness the power of existing non-library expertise instead of requiring library staff to become experts or “Jacks/Jills of all trades,” though we still require all library services staff to be aware of specialist activities and to become experts in certain areas (e.g., scholarly publishing and research methods).

4.2 No Fear

Perhaps related to flexibility is the concept of forging ahead on developing new services which clearly support professors and students rather than waiting for our institutions to adapt to ever-changing environmental situations; NAE has called this “the application of invention—the fusion of new developments and new approaches to solve real problems” (National Academy of Engineering, 2005, p. 44). Change is possible even in environments which are inherently—even openly—hostile to it, and the author of this paper argues that losing our fear about (though not sensitivities to) local political outcomes is worth it, both at a personal level and—most importantly—in terms of providing leadership examples to our colleagues and students.

In this way, the library can function as a neutral but active facilitator or catalyst to the improvement of the educational process, rather than an observer of events happening around the library on a campus. In our services team, we are informally referring to this process as “beyond embedding” (Skenderija et al., 2017), incorporating NAE’s *Design Principles to Expand Higher Education Capacity*: institutional leadership (across campus), targeted recruitment (investing in K12), personal attention, peer support, enriched learning (beyond-the-classroom hands-on opportunities and internships), bridging to the next level (helping learners envision pathways to future career development), and continuous evaluation (National Academy of Engineering, 2005, p. 43).

Support from the Department of Mechanics has been essential to the efforts described in this case study, helping smooth feathers for those concerned with blurring of traditional boundaries.

4.3 Different Packaging for Information Literacy Concepts: Real-Life Tasks?

Although we touch upon most areas of the *Information Literacy Standards for Science and Engineering/Technology Standards* in our courses (The ALA/ACRL/STS Task Force on Information Literacy for Science and Technology, 2017), the author has found it quite difficult to use library-specific terms with course participants and has been experimenting with various different ways of repackaging concepts to better match language and ideas which resonate with collaborators and students. By no means have these efforts yet been completely successful, especially in one-off sessions; our discursive experiments are outlined in Skenderija et al. (2017).

Mapping our course curricula directly to the level of granularity provided in the information literacy standards cannot be easily achieved (Appendix C), and early doctoral students may not yet have been exposed to all aspects of the research lifecycle. In other words, learners might not yet be able to “build links between abstract concepts and real-life tasks” (National Academy of Engineering, 2005, p. 90).

Therefore, working with students and researchers individually is the ultimate goal of our current efforts, because even our full semester courses do not provide us with the ability to cover the expansive territory of the information literacy standards in depth and we do not yet have the ability to map our efforts to university curricula systematically. In individual consultation sessions, we can and are making real breakthroughs in assisting learners in all areas touching upon information literacy concepts, because we are working with them in the context of *specific real-life writing and research tasks*.

4.4 “Mushrooming” v. Collaboration

All of our courses were purposefully envisioned as meeting places for advanced students and researchers conducting work in different disciplines, because much campus activity currently takes place at the departmental level. The author has personally witnessed the great benefits provided to course participants in meeting peers from different research areas, particularly in the context of the presentation course setting.

The temptation is always there to duplicate similar courses at the departmental level, but the author would advocate a more strategic, coordinated future approach in order to avoid a “mushroomed” situation in which many concurrent courses are run, all slightly different but neatly fitting into campus organizational structures. However, this is a decision which must be made at the university (or cross-university level), and administrators might wish to ask themselves if they would like to foster the development of a “CTU doctoral student experience.” The library, as a seasoned and experienced partner, could assist in these efforts and systematically take the lead in such efforts—for CTU or other institutions across the Czech Republic.

Here, the author will transition into the first person: I would like to present readers with a quote from the great American higher education leader, William G. Bowen, in an article entitled *New Times Always; Old Time We Cannot Keep*: “It is important to avoid being trapped by too much institutional hubris and too much institutional competition” (Bowen, 2005).

I believe we owe it to our students to do better in preparing them for the demands of doctoral education, and this includes *providing positive examples* to our students in our ability to collaborate with and help one another. IATUL is setting a terrific cross-library collaboration example in this regard.

5 Conclusion

I recently re-read the groundbreaking ethnographic study *Laboratory Life: The Construction of Scientific Facts* (Latour & Woolgar, 1986). The book presents a fascinating journey through the Salk Institute from the perspective of a French philosopher/anthropologist and presents a rare glimpse into the inner workings of a high-caliber research institution as a kind of *factory* for written documents:

How is it that the costly apparatus, animals, chemicals, and activities of the bench space combine to produce a written document, and why are these documents so highly valued by participants? After several further excursions into the bench space, it strikes our observer that its members are compulsive and almost manic writers (Latour & Woolgar, 1986, p. 48).

Reading and writing *well*, readers of the book will discover, are the essential keys to unlocking the world of the best research grants, the best journals, the best institutional rankings. Fame and scientific glory.

Without superior reading and writing skills, our students face serious competitive disadvantages. Every effort any of us make in changing this—within or beyond the borders of our institutions—makes it more likely they will succeed in whatever it is they dream (even if only some of them become writing maniacs).

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Appendix A: Current Scientific Writing Syllabus



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Week	Topic	Reading/Homework
1	Introductions Language focus: Common mistakes made by non-native authors	Strunk, W., White, E.B., Angell, R. (2014). <i>Elements of style</i> . Harlow: Pearson. “Elementary rules of usage” Homework: Pre-test
2	Publishing focus: Structure of a scientific paper, abstract Language focus: Sentence structure and word order, user of tenses in different parts of a paper	Glasman-Deal, H. (2010). <i>Science research writing for non-native speakers of English</i> . London: Imperial College Press. “Writing the abstract”
3	Guest speaker: Writing in Architecture Publishing focus: Title and introduction Language focus: Reporting verbs, capitalization	Cargill, M. & O'Connor, P. (2013). <i>Writing scientific research articles: Strategies and steps</i> . Chichester: Wiley-Blackwell. “Writing the introduction” Schimel, J. (2012). <i>How to write papers that get cited and proposals that get funded</i> . New York: Oxford University Press. “Writing introductions: The opening, the funnel, and the challenge”
4	Publishing focus: Materials and methods Language focus: Articles	Quirk, R., Greenbaum, S., Leech, G., Svartvik, J. (1985). <i>Comprehensive grammar of the English language</i> . London: Longman. “The use of articles with common nouns” Homework: Exercises, course to date
5	Publishing focus: Results	Turabian, K. (2013). <i>A manual for writers of research papers, theses, and dissertations: Chicago style for students and researchers</i> . Chicago: University of Chicago Press. Day, R. A. & Gastel, B. (2012). <i>How to write and publish a scientific paper</i> . Cambridge: Cambridge University Press. “Use and Misuse of English” Exercise: punctuation
6	Information skills focus: Who, what to trust?	View full presentation

7	Publishing focus: Discussion and conclusion Language focus: Modality, passive versus active voice	Schimel, J. (2012). <u>How to write papers that get cited and proposals that get funded</u> . New York: Oxford University Press. “The Resolution” Glasman-Deal, H. (2010). <u>Science research writing for non-native speakers of English</u> . London: Imperial College Press. “Writing the discussion/conclusion”
8	Publishing focus: Assessment of journals, researchers, and institutions Information skills focus: Research integrity	Alley, M. (1996). <u>The craft of scientific writing</u> . New York: Springer. “Being Precise” + “Being Forthright” View full Research Integrity presentation
9	Publishing focus: Citations, references, acknowledgements; technical writing, typesetting of scientific papers (equations, elementary typographic rules, brief intro to LaTeX)	Knuth, D.E., Larrabee, T., & Roberts, P. M. (1987). <i>Mathematical writing</i> . Retrieved from: http://www-cs-faculty.stanford.edu/~uno/papers/cs1193.pdf
10	Publishing focus: Homework feedback Language focus: prepositions	Alley, M. (1996). <u>The craft of scientific writing</u> . New York: Springer. “Being Clear + Being Precise”
11	Language focus: Style – clarity, formality, redundancy, ambiguity	Alley, M. (1996). <u>The craft of scientific writing</u> . New York: Springer. “Being Familiar”
12	Language focus: style – energizing writing, fluidity	Alley, M. (1996). <u>The craft of scientific writing</u> . New York: Springer. “Being Fluid” Schimel, J. (2012). <u>How to write papers that get cited and proposals that get funded</u> . New York: Oxford University Press. Homework: Feedback form
13	Guest speaker: Successful project writing	Homework: Final test
14	Review and discussion	

Appendix B: Initial Gaining Confidence Presenting in English Syllabus, 2016

Topic	Assignment
Introductions (or: Tell Me About Yourself)	Come to class prepared to introduce yourself to your colleagues.
Audience Awareness	Please take three ORIGINAL pictures or screenshots (that is, that you take yourself - not from pre-existing websites, etc.; no clip art!) that represent: 1. Who you are: Your faculty or research group 2. Who you are: Your research space (even if this is just a computer) 3. What you do: Your research (be as creative as you would like to be in this) Then put the three pictures in PowerPoint or similar presentation software of choice (but please: no Prezi; sample for me, attached).
Introducing Colleagues	Please pick a researcher you really admire (a favorite professor, a famous scientist [living or dead], Nobel Prize winner, etc.). The only requirement is that the person has to be doing/has done academic research of some kind...it doesn't have to be in your field.

	<p>1. Who they are/were: Name of the person and a little about the institution or research group they're most known for</p> <p>2. Why you admire this person?</p> <p>3. What they do/did: Describe a specific research area. It can be short, but you should say enough so that it's clear to everyone in class</p>
Talking about Research Methods	<p>For next week's homework, please prepare to speak for five minutes in more detail about your research methodology (send to me by midnight Nov 8).</p> <p>To get us all used to the idea of video in a couple of weeks, I will take a still picture or two of each person while they are presenting. This will also simulate real life, where at conferences they sometimes have photographers roaming around.</p> <p>I will give you your photos individually by email after the class...it's to get used to seeing yourself in action; please do not worry or be shy to come to class next week because of this.</p>
Talking about a Research Problem	The homework for next week will be to create and present 3-5 slides on *a problem* you are having/have had with your research.
Tell Me More About Yourself Tell Me More About Yourself	The homework for next week's class will be 1-3 slides regarding your history/life (as a break from talking about research). You can be as creative as you'd like.
About Myself: Job/Research Likes/Dislikes	Please create 3-5 slides describing EITHER your favorite job/research activity OR your least favorite job/research activity, throughout your life so far.
Small Talk: Celebrating the Holidays	Please create 3-5 slides about how you like to celebrate the year-end holidays , nowadays or in your life past.
Research Data	Present data you are using for a current project (e.g., your data, how you store it, how you interpret it)
Pulling It All Together: Final Class	Create a presentation re-introducing your research project to the audience based on what you have learned during the semester. I will find more audience members for this final class.

Appendix C: An Experiment in Linking Information Literacy Concepts to

Course Content and Real-Life Tasks

Information Literacy Performance Indicator (<i>The information literate student...</i>)	Curricular Area	Sample Real-Life Task or Assignment, Early Doctoral Student
Defines and articulate the need for information (research topic, hypothesis, general sources and key terms)	<p>Writing course: Title, introduction, abstract</p> <p>Writing course: Who, what to trust?</p>	<p>Write your dissertation abstract in English, including keywords</p> <p>Write a summary of your dissertation topic.</p>
Identifies a variety of types and formats of potential sources for information (types of sources, formats, data, provider of information)	Writing course: Who, what to trust?	Write an annotated list of twenty key resources you will use in your doctoral thesis.

Has a working knowledge of the literature in the field and how it is produced (discipline-specific sources, professional associations, interdisciplinary sources, archiving)	Writing course: Who, what to trust?; Research integrity; Assessment of journals, researchers, and institutions	Write an essay about your five-year career plans.
Considers the costs and benefits of acquiring the needed information (ILL, tradeoffs, organizational plan, competitive information, across languages)	Writing course, full cycle	Find and order one book the library does not have for your dissertation via ILL.
Selects the most appropriate investigative methods or information retrieval systems for assessing the needed information (research method, approaches for accessing systems)	Writing course: Materials and methods; Who, what to trust? Confidence course: Talking about research methods	Create three slides describing the methodology of your current project.
Constructs and implements effectively designed search strategies (keywords, input strategies, search strategies, citation following)	Writing course: Who, what to trust?	Write down your strategy for finding articles for your dissertation.
Retrieves information using a variety of methods (including talking to humans, research techniques – quantitative or qualitative)	Writing course: Materials and methods Presenting courses, full cycle	Create three slides describing a problem you have had with your research to date.
Refines the search strategy if necessary (assesses information and revises strategy intelligently)	Writing course: Who, what to trust?	Find your Master thesis and write one paragraph about how you plan to improve the literature review in your dissertation.
Extracts, records, transfers, and manages the information (with appropriate technology, systematic approach to organization, citation management)	Writing course: Citations, list of references; Research integrity Confidence course: Research data	Present data you are using for a current project.
Summarizes the main ideas to be extracted from the information gathered (structure of scientific paper, critical analysis of information)	Full cycle, writing course Full cycle, presenting courses	Write a one-page essay summarizing a new article in a top journal from your field.
Synthesizes main ideas to construct new concepts (synthesis of ideas, new hypotheses)	Full cycle, writing course Full cycle, presenting courses	Write a one-page essay comparing two recent articles in your field.
Compares new knowledge with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information (tests theories, balanced viewpoint)	Full cycle, writing course	Create an annotated bibliography with proper citations which illustrates the originality in your dissertation topic.
Validates understanding and interpretation of the information through discourse	Full cycle, presenting courses	Read this article and come to class prepared to discuss its original contribution to its field.

with other individuals, small groups or teams, subject-area experts, and/or practitioners (participates in discussions, works effectively in small groups or teams, seeks expert opinion)	Planned future journal and research discussion groups	
Determines whether the initial query should be revised	Writing course: Who, what to trust	Write a paragraph analyzing a systematic review query.
Evaluates the procured information and the entire process (applies improvements to subsequent practice)	Full cycle, writing course Confidence course: Putting it all together	Create three slides re-introducing your research topic.
Understand many of the ethical, legal, and socio-economic issues surrounding information and technology (privacy, censorship, intellectual property)	Writing course: Research integrity	Write an essay which illustrates how your dissertation topic fits into a broader societal context.
Follows laws, regulations, institutional policies, and etiquette related to the access and use of information resources	Writing course: Research integrity	Write a one-page essay describing the strengths and weaknesses of Scopus, Web of Science, and Google Scholar.
Acknowledges the use of information sources in communicating the product or performance (appropriate documentation style, acknowledgements)	Writing course: Citations, list of references, acknowledgements	Look up the author guide for a journal you wish to publish in and write an acknowledgement statement based on the author guide.
Applies creativity in the use of information for a particular product or performance	Full cycle, presenting courses	Create three slides demonstrating how your dissertation research is original.
Evaluates the final product or performance and revises the development process used as necessary	Full cycle, writing course Full cycle, presenting courses	Write a one-page essay describing the strengths and weaknesses of a product or software your department has developed.
Communicates the product or performance effectively to others	Full cycle, writing course Full cycle, presenting courses	Create three slides describing a piece of equipment or software crucial to your research.
Recognizes the value of ongoing assimilation and preservation of knowledge in the field	Writing course: Who, what to trust and research integrity	Write a one-page essay describing how you manage data for your dissertation.
Uses a variety of methods and emerging technologies for keeping current in the field	Full cycle, writing course	Write a one-page essay describing how you organize and read articles about new developments in your field.