UBLIS 575DS

**Deliverable 2. Research Topic Definition. Guide**

**This deliverable will result in a topic that will be the basis for your research proposal** (Deliverable 3).   
You will not do research in this course, you will propose research. The scope of what you propose could be small ꟷ something you could to on your own as action research on your job ꟷ or it could be very large ꟷ a $20 million project you propose to a funding agency. I will provide some guidance in the process.

**Tasks**

1 Develop a topic for an empirical research study that produces new knowledge  
**Start with short definitions of two quite different topics**, using the two copies of the mandatory template in   
 Box\575DS\Week03\UBLIS575DS-03.2$3-Deliverable2TopicDefinition.docx   
Then select one topic and elaborate it. This will be the topic for your research proposal (unless you change your mind and choose yet a different topic, for which you would need to start over with the topic definition work).

2 Serve as critic to one of your group mates. **See next page for arrangements**.

**Content of the topic definitions.** See also Lecture 3.2

The sections of Deliverable 2 Topic Definition can be reused (perhaps revised) in   
Deliverable 3 Research Proposal. The section numbers are the same, and the guidance is consolidated in

Box\575DS\Week06\UBLIS575DS-06.2$3-Deliverable3ResearchProposalGuide.docx

So for each numbered section of the Deliverable 2 template look up the section number in the Deliverable 3 guide for instructions

**Format of topic definitions and critiques.**

* Stay with Word. Do critiques in Word:
* Overall critique / comment as text before the author's text. End with a Section break, new page  
  Specific changes and comments as tracked changes and comments in the margin.
* Two topic definitions, 600-800 words each, 1,200 - 1,600 words total.

**This guide includes two examples**

Topic 1. Digital materials and services vs. paper materials and in-person services

Topic 2. Chaining cars into a train at age 2 ▬▬► chaining ideas into an inference at age 10

**The process.** See next page

The process is tightly scripted. Since you work with others, deadlines are important for this part of the course.

**Peer critique arrangements** (for topic development, optionally for the development of the research proposal):

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| Each student has one *peer critic*: | Group of three, A, B, and C | A critiques B, B critiques C, C critiques A. |
| Group of four, A, B, C, and D | A critiques B, B critiques C, C critiques D, D critiques A. |

**The process.**

Five highly scripted steps, see the calendar below:

1. Prepare drafts for two research topics,
2. Get peer critique,
3. Revise,
4. Get instructor critique,
5. Select and elaborate final topic,
6. Get instructor critique

Communication between author and critic should be shared with the group (through address list or private channel).   
All topics are shared in the group, but

* Only the author is responsible for submitting and revising,
* Only the critic is responsible for the critique (a Word document with comments and tracked changes). The other group members can read these documents (and chime in with comments) if they want to.

Submissions by direct message to Amy Miller. I will return my comments in a direct message to you.   
Feel free to share my comments with the group.

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| **Step** | **Date** | **Who** | **Tasks of student author *Task of student critic or task of the instructor*** |
| 1 | W 09-15 | **Author** | Develop **two** preliminary topic definitions, **each on its own template copy**.  Read one source for each topic (a paper from the readings or quick Google search). |
|  | M 09-20 |  | Pass preliminary topic definitions to critic |
| *2* | *Tu 09-21* | ***Critic*** | *Critique both topic definitions* |
|  | *Th 09-23* |  | *Pass critiques to author* |
| 3 | F 09-24 | **Author** | Revise topic definitions in light of critiques |
|  | M 09-27 |  | Submit revised topic definitions to instructor |
| *4* | *Tu 09-28* | ***Instructor*** | *Prepare comments on both topic definitions* |
|  | *W 09-29* |  | *Return topic definitions with comments to author* |
| 5 | Th 09-30 | **Author** | Select final research proposal topic and elaborate definition. |
|  | Tu 10-05 |  | Submit elaborated definition of topic for research proposal to instructor |

**Topic definition example 1**

**Note on this example**. This is an interesting topic, and the example illustrates the use of the different parts of the template quite well. So, the example will help you to analyze your topics. However, it is not a good example when it comes to focus and length. This is a broad area in which many specific topics can be studied. Your topics should be focused, and your topic definition should be much shorter. For example, a focused topic could deal just with research question number 4 (bold). The properly narrowed topic would be interesting to work on.

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| **Title** | | **Digital materials and services vs paper materials and in-person services** |
| **1.2 Topic / Research question** | | **Topic / Research questions / foreshadowing questions** (aspects of the topic)  *Can include hypotheses; for each give reasons for your belief that the hypothesis is plausibl*e.  How do people use digital materials and services vs paper materials and in-person services. What are the effects of using the different materials/services on finding relevant information and on absorbing that information.  This topic is very broad. "People" includes any type of user in any type of environment, the general public, K-12 students in school, university students on campus or online, physicians, nurses, and patients in hospitals, to give just a few examples. So, for a single study the topic needs to be narrowed; we will focus on K-12 students as users of school libraries, public libraries, and many information systems accessible through the Internet.  **Research questions**  1 What digital and paper-based services and materials (including in-person services) are offered by school and public libraries? What services are offered on the Web, including digital-only libraries  2 Which of these services do K-12 students use for what purpose? how often?  3 How successful are they in finding what they need depending on purpose and service used  4 **How well do students absorb and learn information from paper vs digital materials** |
| **1.3 Source of topic**  (related to Significance) | | **How did you come upon this topic? What prompted your interest in the topic?**  Need to decide on the allocation of resources between maintaining a collection of paper materials and providing in-person assistance to students vs "going digital"  Also need guidance on what materials and services to offer on paper / in person and what to offer digitally  Is giving K-12 students cheap tablets or laptops and making textbooks and other materials available for reading on the screen rather than on paper beneficial for learning?  Some studies show that the comprehension of larger texts suffers when the student reads on the computer screen or a tablet or a cell phone (where presentation is poor due to the small size). |
| **3.1 Relevant theories** | | **Theories that might be helpful in studying the topic**  Theories of reading comprehension  Learning theory  Theories of attention and focus (if there are any) |
| **3.2 Major variables** | **Major variables.** *Just a heading, enter variables in the appropriate rows below.* |
| **Descriptive variables** *For descriptive studies* | **Important characteristics for describing a case**.  Note: For a descriptive study, the variables listed as independent variables can be used as descriptive variables |
| **Independent variables** *For explanatory studies* | **Independent variables (causal factors)**  **User variables**  User demographics  Age  Gender  Education  Language  Socio-economic status  Home environment  Computer availability (better devices)  Connectivity  Other user characteristics  Searching ability  Reading level  Experience with reading digital materials  Information-related purpose of the user  Homework  Leisure reading  Type of need, type of question  Read whole document  Specific question with factual or short answer  Other purpose of the user  Access to computers  Meeting place  Social interaction  Peace and quiet  **System variables**  Collection (domain, coverage)  Services available  Search assistance  Bilingual assistance  Meeting places available  Quiet places available  Computers available (better devices)  Connectivity available  Free vs fee-based  **User-system relationship**  Ease of getting to the paper library |
| **Dependent variables** *For explanatory studies* | **Dependent variables (effects)**  Reading comprehension  Retention of material read  Learning outcomes in various subjects |
| **Other variables** *For explanatory studies* | **Other variables**  *Mediating variables, control variables, variables not in a causal relationship* |
| **Methods** | | **Methods** *Very brief* Note: Much more extensive than required, just first notes  Schools and libraries will be selected as study context and allow for comparison.  Sample of students  Stratified sample of students by grade level, drawn with assistance from the school / teachers  Convenience sample of students using school library  Convenience sample of teachers to interview  Study library users, by specific library. Several ways of data collection, triangulate   * Parallel data collection methods for physical and digital * Observe in the brick-and-mortar library * Do a paper-based survey or an electronic survey * Anonymized query logs (from both physical and digital libraries) * Interview using a convenience sample (possibly using chat) * Talk to librarians about users and their questions * Questions based on variables, also open-ended to find more variables * Also ask about use of the other type of library, how do they select where to go * Ask about interaction with librarian   Ask about familiarity with services from multiple sources  Study services  Personality of librarians  Analysis: Tabulation, qualitative analysis  Compare reading comprehension and broader learning outcomes when using   * paper materials * tablets / laptops * an optimized combination, selecting the best presentation to the material to be learned |
| **1.5 Can be answered by research?** | | **Can be answered by research? How? Or why not?**  *Can outcomes be measured?*  *Do outcomes appear within the time frame of the study? Or are there "sleeper outcomes" that take a long time to appear?*  *Can factors other than those being investigated be ruled out or controlled?*  *Can the data needed be collected?*  **For research question 4**   * Reading comprehension can be tested by a quasi-experimental set-up with a sample of students, each student reading different materials in each modality and being tested immediately after and after a week on what they retain from the reading. In this case outcomes are quite short-term * Can follow students' academic performance using the results of regular assessments in the course of normal school activity. Comprehensive data available at the end of the school year, with another assessment done at the end of summer specifically for the study (if not done by the school). * Some caveats * Some outcomes are hard to measure. * Some students knowledge will not come out by the usual assessment methods. Need to find novel ways to elicit students' knowledge * There are many characteristics of individual students, teachers, and the subject to be learned that influence the results. Need to analyze results for each individual student to catch interactions between these individual variables and the treatment. |
| **1.6 Impact / significance** *(not to be confused with statistical significance)* | **Why do this study?** *What are its expected contributions to the general knowledge base of the topic's discipline and beyond and/or to the knowledge about a specific case?  How important are these contributions? How can they be used to improve practice? Why do you care? Why will other people care?  Why should a funding agency give you money?* |
| **1.6.1 Theoretical contributions** | **Theoretical significance**  *Changing belief in existing theories. Suggesting modifications. Suggesting new theories. Basis for gaining more knowledge, relationship to other results, basis for generalization.*  Will shed light on how presentation modality influences mental processing. Thus, will contribute to the theory of reading comprehension and theories of how people structure knowledge in their minds. |
| **1.6.2 Practical contributions** | **Practical significance.**  Is the practice of some school systems of replacing textbooks with tablets/laptops a good thing?  Looking at the broader study, results can be used   * to better align provision of services with user requirements * to educate users to make them more savvy in choosing materials and services best serving their purpose * Improve services, esp. focused on particular user groups * Bridge digital divide * Improve retrieval system * Learn for digital libraries from paper libraries and vice versa * Ultimately, improve students' learning |
| **1.6.3 Importance for a specific decision** | **For a specific design question or decision on a specific action,  discuss the importance of getting an answer to the research question and other knowledge gained from the study** *Here optional and very brief. Elaborated in the Research Proposal.*  **Specific action:** Should a school system replace paper textbooks with iPads on which textbooks are available?  This action may cause some harm (students may learn less due lower comprehension of what they read; they may use their iPads for an unhealthy amount of video gaming) and has increased costs. It would have benefits of equalizing access to computers (bridging the digital divide). Taking this action is premature until there is more evidence on the impact on comprehension and learning, such as would be produced by this study.  In this case, the action could be modified: Give students iPads, but keep the books. If a study shows that comprehension reading on the iPad is just as good as reading from a paper book, paper books could be discontinued. |

**Topic definition example 2**

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| **Title** | **Chaining cars into a train at age 2 ▬▬► chaining ideas into an inference at 10** |
| **1.2 Topic / Research question** | **Topic / Research questions / foreshadowing questions** (aspects of the topic)  *Can include hypotheses; for each give reasons for your belief that the hypothesis is plausibl*e.  **Hypothesis:** If a two-year old chains two or three cars together into a train, it prepares their mind for inference, chaining two propositions together to arrive at a conclusion when they are older.  **Reason why plausible.** Connecting two or three cars (such as Duplo cars) into a train is an accomplishment beyond putting two Duplo bricks together. There is an analogy to inference:  Source: Toy train: Coupling two toy train cars to create a train  Target: Inference Chaining two propositions to create an inference.  The hypothesis is plausible in light of a considerable body of literature on the idea of embodied cognition that makes the point, supported by some empirical evidence, that abstract cognitive states are grounded in states of the body and, I add, actions the body takes in the physical world. So, this hypothesis is by no means outlandish and worthy of some research |
| **1.3 Source of topic**  (related to Significance) | **How did you come upon this topic?**  In a charitable gift-giving program I buy a lot of toys for children of all ages. For many reasons I think Duplo building sets are good for learning through play, so we buy many of these, making sure they include at least two vehicles that can be connected, which affords a different kind of play. One year I noticed that Duplo sets that used to have two cars had only one. That got me thinking more about the benefits of two (or better yet three+) cars that can be chained into a train, as further explained in 1.2. So, I bought separately large batches of Duple that included many cars that can be coupled (not all Duplo vehicles can) and added two cars to each building set (the action). |
| **3.1 Relevant theories** | **Theories that might be helpful in studying the topic**  Embodied cognition |
| **3.2 Major variables** | **Major variables.** *Just a heading, enter variables in the appropriate rows below.* |
| **Descriptive variables** *For descriptive studies* | **Important characteristics for describing a case**. |
| **Independent variables** *For explanatory studies* | **Independent variables (causal factors)**  Number of train cars a child at age 2 has access to (0, 1, 2+) |
| **Dependent variables** *For explanatory studies* | **Dependent variables (effects)**  Ability of child at age 10 to chain two propositions to arrive at an inference. |
| **Other variables** *For explanatory studies* | **Other variables**  *Mediating variables, control variables, variables not in a causal relationship* |
| **4 Methods** | **Methods** *Very brief*  Find two groups of children aged 2, one with access to 2+ cars, the other without.  Test each group on their ability to draw inferences at age 10 |
| **1.5 Can be answered by research?** | **Can be answered by research? How? Or why not?** *Can outcomes be measured?*  *Do outcomes appear within the time frame of the study? Or are there "sleeper outcomes" that take a long time to appear?*  *Can factors other than those being investigated be ruled out or controlled?*  *Can the data needed be collected?*  It is not feasible to test this hypothesis, the question cannot be answered.   * The postulated outcome, can a ten-year old make inferences to arrive at conclusions, can be measured, **but** * This is a "sleeper outcome", it takes years to appear. * There are many factors that influence the ability of a 10-year-old to draw inferences. It is not feasible to hover over a child for 8 years and observe their every move and information input, much less 50 children if that is our sample. |
| **1.6 Impact / significance** *(not to be confused with statistical significance* | **Why do this study?** *What are its expected contributions to the general knowledge base of the topic's discipline and beyond and/or to the knowledge about a specific case? How important are these contributions? How can they be used to improve practice? Why do you care? Why will other people care? Why should a funding agency give you money?* |
| **1.6.1 Theoretical** | **Theoretical significance / significance for the discipline** *Changing belief in existing theories. Suggesting modifications. Suggesting new theories. Basis for gaining more knowledge, relationship to other results, basis for generalization.*  Could provide more evidence for embodied cognition.  Could shed light on analogical reasoning.  Would be contribution to learning theory, in particular explaining the effect of using manipulables at early ages on later abstract reasoning. |
| **1.6.2 Practical** | **Practical significance**  For the specific case: Would tell us whether making sure each Duplo building set has at least two cars is beneficial by promoting later reasoning ability.  More generally: Would provide motivation to do a systematic search for play objects (manipulables) for which an analogy to abstract reasoning can be established. This might have great benefits for learning. |
| **1.6.3 Importance for a specific decision** | **For a specific design question or decision on a specific action,  discuss the importance of getting an answer to the research question and other knowledge gained from the study** *Here optional and very brief. Elaborated in the Research Proposal.*  **Action considered:** Make sure that Duplo sets given to two-year-olds include at least two, better three cars that can be connected.  For this action, there is no potential harm, cost is minimal, and there is the known benefit of increased play value. So, there is already enough reason to adopt the action; no need to have the results of this study. That is a good thing, because the study could not be done anyhow. Since the hypothesis is plausible, albeit not provable, there might be an additional benefit, which would just be icing on the cake. |