Unit 2: Research Questions, the Literature Review and the Research Proposal

Required Reading

Dawson, C. (2015) Projects in Computing and Information Systems: A Student's Guide. Harlow: Pearson.

- Chapter 1 Introduction p 4.
- Chapter 1 Section 1.2.2 p 6-8.
- Chapter 2 Section 2.1 p 17-22.
- Chapter 2 Section 2.2.1 p 22-24.
- Chapter 3 Section 3.2 p 44-45.
- Chapter 3 Section 3.3 p 53-59.
- Chapter 5 p 90-93.
- Chapter 5 Section 5.2 p 95-104.
- Chapter 5 Section 5.6 p 108-112.
- Chapter 5 Section 5.5 p 106-108.

Chapter 1
Summary
Chapter 1's introduction emphasizes the academic rigor expected from students pursuing computing projects. Unlike industry projects, which prioritize practical problem-solving, academic projects require a deeper understanding, justification, and contextualization. The text highlights how such projects assess a student's multidisciplinary skills, promote independent work, and encourage personal contributions. Academic projects often represent a significant portion of degree requirements, necessitating advanced research and creative thinking to stand out.
In Section 1.2.2, various computing project types are introduced, each demanding a specific focus and methodology. Research-based projects involve literature reviews to identify strengths, weaknesses, and gaps in a field. Development projects focus on creating software, algorithms, or systems while integrating evaluations of both the process and product. Evaluation projects analyze methodologies, technologies, or implementations, while industry-based projects solve real-world problems for clients or organizations. Problem-solving projects propose new approaches to improve efficiency or address issues within existing frameworks. These categories, though distinct, frequently overlap in practice, blending elements from multiple approaches to foster comprehensive research and innovation.
Reflection
Reflecting on these sections, it becomes evident that computing projects offer an expansive avenue for exploration, learning, and contribution. The emphasis on not merely reproducing existing work but making meaningful additions to the field resonates as a critical takeaway. The outlined categories suggest a structured yet flexible path, encouraging students to align

their interests with academic goals. The challenge lies in balancing theoretical research with practical application while ensuring originality and value in the results.

Chapter 2

Summary

In Chapter 2, Section 2.1 ("What is Research?"), research is defined as a deliberate activity intended to make an original contribution to knowledge. The section emphasizes the importance of originality, the process of gaining new insights, and contributing findings to the broader world of understanding. Research must go beyond simply gathering data—it seeks explanations, builds relationships, and generates theories. The section also outlines a hierarchical view of knowledge comprising data, information, knowledge, and wisdom, where each level builds upon the previous one. Researchers progress through phases of competence and self-awareness, starting from ignorance and potentially reaching unconscious competence as they master a subject.

In Section 2.2.1 ("The Research Process"), four models of research processes are explored: sequential, generalized, circulatory, and evolutionary. The sequential model outlines fixed steps in a linear fashion, while the generalized approach allows for flexibility depending on research outcomes. The circulatory model sees research as a continuous loop where findings generate new questions, whereas the evolutionary model embraces change and refinement over time. The section stresses that research is never truly complete but is instead an ongoing voyage of discovery.

Reflection

Reflecting on Chapter 2, Section 2.1 ("What is Research?"), the nuanced differentiation between merely collecting information and generating meaningful knowledge stands out. The progression from raw data to actionable wisdom illustrates the intellectual rigor demanded by research. The emphasis on dissemination underscores that research is as much about sharing insights as it is about discovery, making collaboration and communication essential components of the research journey.

The insights from Section 2.2.1 highlight the dynamic nature of research. The fluidity of circulatory and evolutionary models acknowledges the unpredictable, iterative character of intellectual inquiry. Recognizing that research may return to previous stages or redefine itself as questions evolve is empowering and encourages adaptability in a field where rigid structures might limit innovation.

Chapter 3

Summary

Chapter 3, Section 3.2 explores the complexities of selecting a suitable project for a degree course in computing. It emphasizes several principles to guide students through this critical decision-making process. The project should be manageable within the given timeframe and require skills that the student either possesses or can feasibly develop. Selecting a topic that genuinely interests the student is crucial, as this will maintain motivation throughout the project. Additionally, projects should ideally support personal development goals and have clear, meaningful outcomes that benefit real clients rather than hypothetical ones. The section advises students to ensure the project aligns with their degree requirements, has sufficient scope, and that necessary resources are accessible. Practical techniques for choosing a project include brainstorming, clustering, consulting past projects, and reviewing academic literature.

In Chapter 3, Section 3.3, the discussion focuses on preparing a successful project proposal. The proposal serves as a formal document to secure approval for a project and acts as a contract between the student, their department, and supervisor. Proposals typically include both implicit elements, such as background information and identification of research gaps, and explicit sections like project title, aims, objectives, expected outcomes, and research methods. The section underscores the importance of clearly defining the scope of the project, ensuring that it makes a meaningful contribution to the field, and identifying potential risks alongside contingency plans. A strong proposal should demonstrate that the project is both feasible and academically rigorous, with a clear pathway to completion.

Reflection

Reflecting Chapter 3, Section 3.2, the importance of choosing a well-defined and relevant project becomes evident. It offers a balanced perspective between the student's ambitions and academic expectations, highlighting how real-world relevance and client collaboration can significantly enhance both the motivation and value of the work. The "so-what?" test serves as a crucial reminder to ensure that the project is meaningful, driving students to pursue research with purpose and rigor.

Reflecting on Chapter 3, Section 3.3, the structured approach to proposal preparation underscores its value not only as an academic requirement but also as a strategic tool for project success. By defining objectives and deliverables early on, students gain clarity on their research direction and can anticipate potential challenges. The emphasis on proofreading and adherence to guidelines highlights professionalism as an integral part of the research process. The section encourages a thoughtful, methodical approach, setting the foundation for a productive and meaningful research journey.

Chapter 5

Summary

Chapter 5, pages 90-93, discusses the importance of literature surveys in academic projects, particularly at research and taught degree levels. It explains that a literature survey consists of a literature search and a literature review. The search involves gathering and organizing existing research, while the review involves critically evaluating and contextualizing the material. The chapter highlights the survey's role in justifying a project, setting it within a broader academic context, and providing a foundation for further research. It emphasizes that projects without a solid literature survey risk being weak, unoriginal, or redundant.

Chapter 5, Section 5.2, pages 95-104, outlines the iterative process of conducting a literature survey. It describes how the process evolves over time, moving from broad exploration to focused analysis. The literature survey begins with defining the scope and boundaries of the search, then involves finding, evaluating, and refining sources. The section stresses that this is not a linear process but a cyclical one where new insights refine the search. It also discusses the challenge of determining when enough material has been gathered, emphasizing systematic and structured searching methods.

Chapter 5, Section 5.5, pages 106-108, focuses on critical evaluation in literature reviews. It discusses how merely summarizing research is insufficient; instead, researchers must assess sources based on factors such as relevance, credibility, contribution to the field, logical consistency, and methodological soundness. The section provides a structured approach to evaluating research, including considering whether conclusions follow logically, identifying biases, and distinguishing between facts and opinions. It also discusses the role of theoretical frameworks and research design in assessing academic work.

Chapter 5, Section 5.6, pages 108-112, details the process of writing a literature review. It explains that a good review should not merely list sources but should synthesize them into a coherent narrative that justifies the research project. The section discusses different ways to structure literature reviews, such as organizing them by themes or research gaps rather than individual sources. It provides an example of a well-structured review that moves from general context to specific focus areas, demonstrating how effective literature reviews refine research questions and highlight the significance of a study.

Reflection

Reflecting on Chapter 3, Section 3.2, it underscores the necessity of a strong research foundation. Without understanding existing work, projects may lack originality or fail to address meaningful gaps in knowledge. The analogy of the literature survey as the foundation of a building is particularly effective—it illustrates that even a well-executed study can collapse without proper groundwork. This section serves as a reminder that before diving into research or development, one must take the time to build on what has already been established.

Chapter 5, Section 5.2 highlights the dynamic nature of literature reviews and the necessity of continual refinement. The "spiraling in" metaphor effectively conveys how researchers

start broadly before narrowing their focus. It also reinforces the idea that literature reviews cannot be rushed—understanding a research field takes time and multiple iterations. This reminds me that research is as much about revising one's approach as it is about finding answers, requiring patience and adaptability.
Chapter 5, Section 5.5, pages 106-108 highlights a key aspect of academic research: the ability to think critically rather than accept information at face value. It reinforces that evaluating sources is not just about credibility but also about understanding how different pieces of research interact. The emphasis on questioning assumptions and identifying gaps makes this section particularly valuable. It serves as a reminder that research is not just about accumulating knowledge but also about analyzing and challenging it.
Reflecting on Chapter 5, Section 5.6, pages 108-112, it is clear that writing a literature review requires careful planning and organization. The section effectively conveys that a literature review should tell a story—showing how research has evolved and where new contributions can be made. The emphasis on identifying gaps and synthesizing existing knowledge rather than simply reporting on it is particularly insightful. This reminds me that strong academic writing is about creating a dialogue between sources rather than just summarizing them.

Healey, M., Matthews, K. & Cook-Sather, A. (2020) Writing about learning and teaching in higher education: Creating and contributing to scholarly conversations across a range of genres. Center for Engaged Learning Open-Access Books, Elon University.

- Chapter 14.

Summary
Chapter 14 of *Writing About Learning and Teaching in Higher Education* explores the process and purpose of writing literature reviews. It emphasizes that a quality literature review goes beyond summarizing existing research; it synthesizes information to generate new insights and frameworks. The authors argue for a "both/and" approach, balancing new research with the synthesis of existing knowledge, particularly within the diverse and scattered fields of the Scholarship of Teaching and Learning (SoTL) and educational research. The chapter outlines key components of effective literature reviews, such as identifying significant topics, establishing the context, applying critical analysis, and structuring the review to engage specific audiences. It highlights that literature reviews can expose both dominant and marginalized perspectives, contributing to scholarly conversations in meaningful ways.
Reflection
Reflecting on this chapter, it becomes clear that literature reviews are not merely academic exercises but are integral to the advancement of knowledge. They serve as bridges connecting past research with future inquiries, helping scholars identify gaps, challenge assumptions, and propose new directions. The emphasis on critical engagement, rather than passive reporting, encourages writers to see themselves as active contributors to their fields. Moreover, the ethical considerations discussed remind us that literature reviews are not just technical tasks but also reflect the reviewer’s scholarly identity and responsibilities within the academic community. This perspective fosters a deeper appreciation for the intellectual rigor and reflective practice required in crafting impactful literature reviews.

Boza, T. (2022) How to Write a Literature Review: Six Steps to Get You from Start to Finish.

Summary
The webpage "How to Write a Literature Review: Six Steps to Get You from Start to Finish" by Tanya Golash-Boza provides a systematic approach to tackling literature reviews for

academic purposes. The guide outlines six practical steps: defining research areas, conducting a comprehensive search for relevant literature, extracting key excerpts, coding the literature based on emerging themes, creating a conceptual schema, and finally, writing the literature review itself. This structured approach simplifies a daunting task and makes the process manageable by breaking it into smaller, actionable components. The methodology emphasizes thorough organization and documentation to maintain clarity and coherence throughout the review.

Reflection

Reflecting on this approach, it becomes evident how vital preparation and organization are to producing a meaningful literature review. The suggestion to code and categorize themes encourages deeper engagement with the material, helping researchers see connections and contradictions within the literature. The guide's practical nature is particularly valuable for graduate students or new researchers who may feel overwhelmed by the scope of literature they need to cover. Following this step-by-step process not only helps streamline the writing process but also fosters a clearer understanding of the research landscape within a given field.

Additional Reading

Kuziemsky, C. & Lau, F. (2016) Handbook of eHealth Evaluation An Evidence-based Approach. University of Victoria.

- Chapter 9.

Marble Jar Channel. (2018) How to write a research paper.

Purdue Online Writing Lab. (n.d.) Writing a Literature Review.