

# 1 Introduction

## Entrance

### 1.1 Introduction to the General Topic (Common Ground)

- **Context of Participatory Knowledge Resources (PKRs):**
  - Knowledge management (KM) has long been recognized as a critical factor in organizational success, allowing institutions to systematically capture, store, and share knowledge for competitive advantage (Nonaka, 1994; Davenport & Prusak, 1998). Effective knowledge management ensures that both explicit knowledge (formal, documented information) and tacit knowledge (informal, experiential insights) are preserved and made accessible within an organization (Nonaka & Takeuchi, 1995). This has traditionally been applied to structured, top-down knowledge dissemination systems within companies and institutions.
  - Participatory knowledge resources are collections of information generated and maintained collaboratively by multiple contributors, often in decentralized or distributed environments (Oliver & Conole, 2003). In academic settings, PKRs enable collective expertise to be pooled, shared, and continually updated to reflect current best practices (Jenkins et al., 2016).
  - This trend aligns with broader movements toward open science and participatory design in knowledge production, where collaborative efforts help democratize knowledge and improve accessibility (Levy et al., 2003).
- **Relevance of Academic Lab Handbooks:**
  - Academic lab handbooks serve as essential tools for capturing protocols, standard operating procedures (SOPs), and experimental knowledge within research labs. They provide continuity for lab members and ensure that critical information is available for future projects (J. Ramage et al., 2015).
  - These handbooks are inherently participatory in nature, with contributions from various stakeholders such as principal investigators (PIs), postdoctoral researchers, graduate students, and even external individuals such as students and administrative staff, given their involvement in the processes typical of a 'distributed organizing' context. This collaborative aspect makes them a unique case of PKRs in academic settings.

- **Importance of Organizing PKRs:**

- Effective organization of these resources is essential for accessibility, knowledge transfer, and collaboration in academic environments (Huckin & Olsen, 1991). However, academic lab handbooks, due to their participatory nature, present unique challenges in organizing this knowledge effectively.

## 1.2 Problem Statement (Complication)

- **Challenges in Organizing Knowledge:**

- While the importance of PKRs is widely recognized, the process of organizing them - particularly in academic settings like lab handbooks - remains underexplored. Existing research on knowledge management (Nonaka, 1994; Davenport & Prusak, 1998) and academic documentation (Ramage et al., 2015) primarily focuses on centralized systems or individual contributions, often overlooking the complexities introduced by multiple contributors, evolving content, and decentralized ownership in participatory systems (Levy et al., 2003).
- The process of organizing knowledge within academic labs is complex due to the informal and dynamic nature of lab work. Information can be fragmented across personal notes, online platforms, and inconsistent documentation practices (Sonnentag, 1998).
- Labs often face challenges with the use of technology and organizing practices, such as managing uneven contributions from team members and maintaining up-to-date protocols (Nonaka, 1994). Versioning systems, for instance, can help address these issues by ensuring that information remains accurate and accessible for all users, but implementing and managing these tools is a significant organizational challenge.
- In the age of open science and global collaboration, the question is no longer whether researchers should share knowledge, but how they can organize and sustain it in dynamic, participatory systems (Fecher & Friesike, 2014). The challenge lies in maintaining transparency, inclusivity, and long-term accessibility while adapting to rapidly changing research environments.

- **Importance of Structure and Accessibility:**

- Effective knowledge organization in lab handbooks is crucial to the efficient functioning of labs. New lab members rely on clear, structured information to onboard quickly and contribute effectively. Well-organized

handbooks reduce redundancies, minimize errors, and help avoid miscommunication during lab operations (Huckin & Olsen, 1991).

- Accessibility to these resources also promotes more transparent and reproducible research practices, key to academic integrity and scientific progress (National Academies of Sciences, Engineering, and Medicine, 2017).

### 1.3 Importance of Study (Concern)

- **Practical Need for Improved Knowledge Sharing:**

- Despite their importance, many academic labs struggle with creating and maintaining clear, organized lab handbooks. Poor knowledge sharing can result in lost institutional knowledge, inefficiencies, and wasted resources as lab members reinvent protocols or struggle to locate critical information (Lave & Wenger, 1991). Studies suggest that up to 70% of critical organizational knowledge remains undocumented, trapped in the minds of employees (Eaves, 2014), a trend that holds especially true in academic labs where knowledge is often siloed in personal notes or informal conversations.
- This study seeks to address this practical issue by examining how lab handbooks, as participatory knowledge resources, can be more effectively organized to promote better knowledge sharing and smoother lab operations.

- **Gap in Scholarly Literature:**

- Existing literature on knowledge management (Nonaka, 1994) and academic documentation (Ramage et al., 2015) tends to focus on centralized systems or individual contributions rather than collective, participatory approaches. Studies on the participatory organization of knowledge in lab environments are particularly limited.
- This study addresses a significant gap by exploring how collaborative contributions to lab handbooks influence their organization, structure, and effectiveness.

### 1.4 Rationale for the Study

- **Gap in Existing Literature:**

- While literature exists on knowledge management systems (Davenport & Prusak, 1998), there is little research that directly addresses the process of organizing participatory knowledge resources in academic labs. The collaborative nature of lab handbooks poses unique challenges not

addressed by traditional knowledge management frameworks (Levy et al., 2003).

- Studies on technical documentation (Huckin & Olsen, 1991) focus on clear, consistent communication but often overlook the impact of multiple contributors, particularly in fast-changing environments like research labs.

- **Why Focus on Academic Lab Handbooks?:**

- Lab handbooks represent a critical intersection of academic knowledge creation, dissemination, and application. They are evolving documents that capture both codified (explicit) and tacit (informal) knowledge from contributors with different expertise levels (Nonaka & Takeuchi, 1995).
- By focusing on lab handbooks, the study will offer insights into how participatory processes in knowledge organization operate in a collaborative academic setting, providing practical implications for improving these systems.
- Moreover, the context of academic labs—small, autonomous units with highly interconnected processes and frequent worker turnover, such as doctoral researchers transitioning between labs—offers valuable insights for general organizational scholars. This mirrors trends seen in modern business environments, like startups, where worker fluctuation and dynamic workspaces are becoming more common, making this research relevant beyond academia.

## 1.5 Research Objective (Course of Action)

- **Purpose of the Study:**

- The main objective of this study is to explore and understand the factors that influence how participatory knowledge resources - specifically academic lab handbooks - are organized. This includes examining the roles of various contributors, the tools and platforms used, and the social or technical dynamics involved in the process.

- **Exploratory Nature of the Study:**

- As an exploratory study, this research seeks to identify patterns, processes, and potential best practices in the participatory organization of lab handbooks. It aims to generate new insights that can inform future studies and practical interventions in academic knowledge management.

## 1.6 Research Question (Course of Action)

- The central research question is: *"What influences the process of organizing participatory knowledge resources in the context of academic lab handbooks?"*
- Sub-questions may include:
  - How do different contributors (e.g., PIs, postdocs, students) shape the structure and content of lab handbooks?
  - What tools, systems, and technologies are employed in organizing and maintaining these handbooks?
  - Which principles and/or best practices are used by employees to organize and maintain these handbooks?
  - What social, institutional, or technical factors affect the process of organizing lab handbooks?

## 1.7 Synthesis of Relevant Literature

- **Review Existing Research on Organizing Academic Knowledge Resources:**
  - Literature on knowledge organization in academic contexts often focuses on individual knowledge creation and static documentation systems (Davenport & Prusak, 1998; Nonaka, 1994). However, participatory knowledge systems, such as those found in lab handbooks, involve multiple contributors and are subject to constant revision (Oliver & Conole, 2003).
  - Studies on academic documentation (Ramage et al., 2015) and technical writing (Huckin & Olsen, 1991) provide insights into organizing information in educational settings, but they often assume single authorship or hierarchical input, which does not account for the decentralized and collaborative nature of lab handbooks.
- **Highlight Gaps in the Literature:**
  - Although knowledge management research is well-developed (Davenport & Prusak, 1998), the specific challenge of organizing participatory knowledge in labs - particularly through collaboratively developed handbooks - remains underexplored (Levy et al., 2003). This study aims to fill that gap by investigating the factors that influence this collaborative process.
- **Position the Study within Broader Knowledge Management Discourse:**
  - This study contributes to the discourse on knowledge management by focusing on the participatory organization of academic knowledge

resources. It connects to fields like participatory design (Schuler & Namioka, 1993) and academic documentation, positioning itself at the intersection of knowledge management, collaborative learning, and technical communication.

## 1.8 Significance of the Study (Contribution)

- **Novelty and Significance of Findings:**
  - This research will contribute to the academic conversation by providing a detailed exploration of the organizational processes behind participatory knowledge resources in academic labs. By identifying the key factors that influence the organization of lab handbooks, the study will offer both theoretical and practical insights for improving knowledge management systems in academic environments.
- **Contribution to Knowledge Management:**
  - By exploring how academic labs organize and manage participatory knowledge resources, this study offers new insights into how collaborative knowledge creation and management can be better organized. It will also refer to the “access and contribution framework” that will be presented in the discussion part, which provides a structured approach to improving these processes.
  - The findings will also contribute to refining theoretical models of knowledge management, particularly in academic and research settings where collaboration and documentation are critical.
- **Practical Implications for Academic Labs:**
  - The study will provide practical guidelines for improving the organization and accessibility of lab handbooks, leading to more efficient lab operations and better knowledge transfer to new lab members (Lave & Wenger, 1991). It will also contribute to the broader goal of enhancing scientific reproducibility and collaboration.
- **Future Research Directions:**
  - The research will also pave the way for future studies on participatory knowledge systems, offering a foundation for exploring how such systems function in other academic and organizational contexts.

## 1.9 Structure of the Thesis

- Provide an overview of the subsequent chapters, outlining the research methodology, data analysis, findings, and conclusions that will be discussed in detail.

## References:

- Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Harvard Business Press.
- Eaves, S. (2014). Middle management knowledge by possession and position: A study of middle managers' knowledge sharing practices. *Journal of Knowledge Management*, 18(3), 1-22.
- Fecher, B., & Friesike, S. (2014). Open science: One term, five schools of thought. In S. Bartling & S. Friesike (Eds.), *Opening science* (pp. 17-47). Springer.
- Huckin, T. N., & Olsen, L. A. (1991). *Technical writing and professional communication for non-native speakers of English*. McGraw-Hill.
- Jenkins, H., Ito, M., & Boyd, D. (2016). *Participatory culture in a networked era: A conversation on youth, learning, commerce, and politics*. Polity Press.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.
- Levy, M., Hadar, I., & Kalman, Y. M. (2003). The interplay between knowledge management and participatory learning in academic settings. *Journal of Information Systems Education*, 14(3), 297-305.
- National Academies of Sciences, Engineering, and Medicine. (2017). *Fostering integrity in research*. The National Academies Press. <https://doi.org/10.17226/21896>
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14-37. <https://doi.org/10.1287/orsc.5.1.14>
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford University Press.
- Oliver, M., & Conole, G. (2003). Evidence-based practice and e-learning in higher education: Can we and should we? *Research Papers in Education*, 18(4), 385-397. <https://doi.org/10.1080/0267152032000176873>
- Ramage, J. D., Bean, J. C., & Johnson, J. (2015). *The Allyn & Bacon guide to writing* (7th ed.). Pearson.
- Schuler, D., & Namioka, A. (1993). *Participatory design: Principles and practices*. CRC Press.
- Sonnentag, S. (1998). Expertise in professional software design: A process study. *Journal of Applied Psychology*, 83(5), 703-715. <https://doi.org/10.1037/0021-9010.83.5.703>

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