Who Gets to Generate Knowledge: Co-creation of an "Open Educational Resources" Textbook

Yaprak Dalat Ward

Fort Hays State University, United States

Abstract

Open Educational Resources (OER) have become indispensable in higher education as mechanisms for improving access, availability concerns, rising costs, inequities embedded in commercial textbooks. While significant literature has documented OER adoption/adaptation as cost saving, less attention has been given to faculty-driven knowledge creation, underlying open textbook development. This case study documented the collaborative process of five faculty engaged in developing an OER textbook for graduate-level educational research students. Based on Nonaka and Takeuchi's SECI model of knowledge creation, the process involved faculty moving from shared tacit knowledge to explicit knowledge, creating an openly licensed textbook, through socialization, externalization, combination, and internalization. Multiple data sources included shared planning documents, draft chapters, and reflective notes generated throughout the process, and prolonged engagement. The initial data analysis yielded four interrelated themes: 1) shared dissatisfaction with commercial textbooks as an agent for collaboration; 2) negotiation of disciplinary and pedagogical assumptions; 3) emergence of collective pedagogical ownership; and 4) conceptualization of the open textbook as a living, revisable product of knowledge. The subsequent data analysis revealed the alignment of four themes with the SECI model of knowledge creation, demonstrating how faculty engaged in a sustained sense-making process and professional learning rather than discrete content production. To conclude, apart from providing students with a freely accessible open textbook, the study was consistent with the OER literature in that the process promoted curricular coherence, strengthened collective pedagogical ownership, and supported sustainable engagement with open pedagogy. The study suggests that OER development provides a scalable, low-risk entry point for faculty participation in open knowledge practices while cultivating institutional cultures of collaboration and equity.

Keywords: *Collaborative process; explicit knowledge; Open Educational Resources; tacit knowledge; SECI model*

1. Introduction

Rising commercial textbook costs continue to pose a significant barrier to student access and success in higher education, particularly for students from historically marginalized and economically vulnerable populations [1,2]. Open Educational Resources (OER), defined as teaching, learning, and research materials which reside in the public domain or are released under an open license, have emerged as a promising alternative addressing both cost and access concerns [3,4]. Research consistently demonstrates that OER adoption reduces financial barriers without diminishing learning outcomes [5–7]. Beyond cost savings, scholars argue that OER challenge traditional models of knowledge ownership by repositioning faculty and learners as contributors to shared knowledge ecosystems [8,9]. Despite this potential, most OER research emphasizes adoption/adaptation outcomes rather than the collaborative processes through which open educational content is created. Less attention has been given to the internal processes through which faculty collaboratively create open textbooks and how such processes shape professional learning, curriculum design, and shared ownership of knowledge. Addressing this gap was essential for understanding how OER initiatives could be sustained as scholarly and pedagogical practices rather than one-time reductions in cost.

The aim of this study was to deepen understanding of the collaborative process of open textbook development and to confirm previous findings. The collaboration focused on the social, relational, and epistemological dimensions of OER development which involved five faculty, situated within a graduate program in college of education. The vision was to respond to the gaps in learning objectives and pedagogical needs as well as release students from a financial burden. The research question which guided the study was: How do faculty collaboratively create an open textbook, and how can this process be understood through the SECI model of knowledge creation?

2. Literature Review

Open Educational Resources are described as educational materials that are freely accessible and openly licensed, permitting use, adaptation, and redistribution with limited restrictions [3]. Open licensing, most commonly through *Creative Commons*, enables what Wiley [4] describes as the 5R permissions: *retain*, *reuse*, *revise*, *remix*, and *redistribute*. These permissions distinguish OER from merely *free* resources by granting legal authority to adapt content for local contexts. A substantial body of literature documents the impact of OER on affordability and access. OER adoption has been associated with comparable or improved learning outcomes while easing the financial burden [5-7]. Studies show that high textbook costs influence enrollment decisions, persistence, and academic performance [1,10]. In addition, OER have been framed as a social justice intervention. Equity-oriented outcomes depend on who creates OER and how knowledge is negotiated during development. Lambert argues that openness must be understood not only in economic terms but also as a mechanism for redistributing *epistemic power* and *representation* [11]. Open pedagogy extends OER principles into teaching practices that emphasize collaboration, transparency, and participatory knowledge creation [12,13]. Practices such as renewable assignments and open publishing position faculty and students as co-creators rather than consumers of content [14].

While student co-creation has received significant attention, faculty-to-faculty collaborative knowledge creation remains underexamined. Although faculty awareness of OER is increasing, participation in OER creation remains limited due to time constraints, lack of incentives, and uncertainty around quality and sustainability [15,16]. Research which examines faculty-created OER highlights professional learning, shared ownership, and curricular coherence as key outcomes [17,18]. However, few studies offer a theoretical explanation of *how* faculty knowledge based on personal experience is transformed into shared, open curricular resources.

2.1. Theoretical Framework: SECI Model of Knowledge Creation

Nonaka and Takeuchi's SECI model of knowledge creation became the foundation of the OER co-creation as the process involved shared knowledge building and collaboration. The model illustrated the dynamic interaction between tacit and explicit knowledge by means of four iterative processes: **S**ocialization, **E**xternalization, **C**ombination, and **I**nternalization [19, 20]. The model has been applied widely in organizational learning and professional development contexts to explain how individual expertise becomes shared knowledge [20]. Recent research has extended the SECI model into educational settings, including collaborative curriculum design and creativity-focused learning environments [21,22]. The alignment between SECI and open pedagogy lies in their shared emphasis on interaction, reflection, and collective meaning-making. In this study, the SECI model served as an analytic lens for understanding the collaboration of creating an OER. Faculty's *tacit knowledge*, personal experience, observations, intuition, became the starting point of the collaborative process, and the end result was *explicit knowledge* which was documented, stored and shared knowledge. [19, 20].

The following diagram (Fig. 1.) illustrates the conceptual relationship among: Open Educational Resources; Open Pedagogy; and the SECI Model of Knowledge Creation.

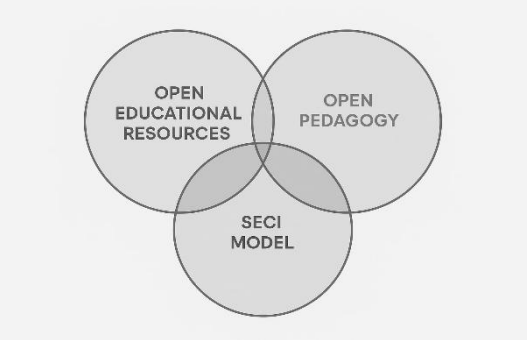

Fig. 1. Conceptual relationship among Open Educational Resources, Open Pedagogy, SECI Model

According to the conceptual relationship, the circle entitled *Open Educational Resources* represents the material and licensing foundation of openness which is the 5R permissions (retain, reuse, revise, remix, redistribute); and access, adaptability, and sustainability [4] which depends on OER adoption or OER creation. The *Open Pedagogy* circle represents the teaching and learning practices enabled by OER which is collaborative knowledge and production; faculty and possibly, students as co-creators;

renewable and participatory assignments. The SECI Model [19, 20], the third circle, demonstrates the theoretical framework, representing the knowledge creation process which explains how openness works in practice and is illustrated as four iterative processes: 1) *Socialization* (faculty sharing tacit knowledge); 2) *Externalization* (articulating ideas into chapters and outcomes); 3) *Combination* (integrating content into a coherent textbook); and 4) *Internalization* (using, teaching with, and revising the OER). Moreover, regarding the conceptual relationship, the center overlap represents the intersection of all three constructs symbolizing faculty-driven open textbook development as a knowledge-creation activity; a form of open pedagogical practice; and structural and legal OER permissions.

Building on OER, open pedagogy, and knowledge creation literature, this study aimed to contribute to a theoretically grounded examination of faculty-driven open textbook development. By applying the SECI model of knowledge creation [19, 20] to a collaborative OER project, the study focused on the social and epistemic dimensions of open knowledge production. In addition, the study demonstrated the understanding of how faculty collectively generate, structure, and internalize OER.

3. Methodology

Employing a case study design, the study explored a collaboration process within a bounded institutional context [23, 24]. The research question which guided the study was: How do faculty collaboratively create an open textbook, and how can this process be understood through the SECI model of knowledge creation? The collaboration process focused on the social, relational, and epistemological dimensions of OER development and involved five faculty members teaching graduate-level educational research courses. One of the faculty members, also the author, collected and analyzed the textual data related to the phenomenon which included shared planning documents, draft chapters, and reflective notes generated throughout the project and prolonged engagement. The linguistics and research background of the author allowed the completion of the thematic analysis. The *analytic memos* [25] kept during the analyses also helped further to strengthen the findings. The data were analyzed in two phases. The initial phase yielded four interrelated themes, consistent with OER research. The subsequent analysis involved interpreting the findings through the four phases of the SECI model to further understand the collaborative process. Findings were verified by *member checking.* Trustworthiness of the study was enhanced by *triangulation* based on multiple data sources [26, 27].

3.1 Data Analysis: Two Phases

The first phase of the data analysis, the initial analytic phase, employed an iterative thematic approach [28] by means of the *Key-word-in-context (KWIC) method* [29] to inductively identify related words/phrases across collected data which included shared planning documents, draft chapters, and reflective notes to remain grounded in faculty language and experiences. Following the identification of the related key words/phrases in the texts, the author manually coded the recurring concerns, points of negotiation, and moments of shared decision-making during the prolonged engagement of faculty collaboration and pedagogical sense-making. *Values coding* was selected since the data included the *interplay between/among thoughts, feelings and action* and made it possible to interpret the faculty *values, attitudes and beliefs* during the process [25]. *Analytic memos* [25] generated by the author throughout the analytic phases, further documented emerging interpretations, tensions, and shifts in understanding the themes [29]. Through constant comparison, codes were clustered into categories leading to broader themes which reflected patterns of collaboration. As a result, the open textbook development revealed four interrelated themes characterizing: 1) shared dissatisfaction with commercial textbooks as an agent for collaboration; 2) negotiation of disciplinary and pedagogical assumptions; 3) emergence of collective pedagogical ownership; and 4) conceptualization of the open textbook as a living, revisable knowledge artifact.

Following the initial analytic phase, the subsequent analytic phase involved contextualizing the four themes within the process of the SECI model of knowledge creation in order to examine how faculty moved between tacit and explicit knowledge during this open textbook development. A*nalytic memos* also helped link each theme to the corresponding SECI phase. This process was also completed manually by juxtaposing the key words in the themes to the description of the SECI model phases including socialization, externalization, combination, and internalization.

4. Findings

The development of an open textbook functioned as a collaborative knowledge-creation process rather than a linear authorship task. The five faculty engaged in a collaborative process to transform tacit pedagogical expertise into explicit, openly licensed curricular knowledge through sustained interaction. The group did not simply divide writing tasks; rather, engaged in collective sense-making as they showed their tacit instructional knowledge, articulated shared assumptions about educational research, and iteratively refined their perspectives through dialogue and co-authorship. Consistent with the SECI model of knowledge creation, this process involved dynamic movement between tacit and explicit knowledge as faculty socialized professional experiences, externalized implicit understandings into curricular structures, combined individual contributions into a coherent open textbook, and internalized the resulting resource through classroom use and revision [21].

The codes and categories leading to the four interrelated themes emerged prior to mapping the SECI phases and were characterized as follows: 1) The first insight was that *faculty frustration* functioned as *productive tension* that initiated the collaboration. The *shared dissatisfaction* of faculty emerged from codes such as thoughts and feelings of *frustration*, *textbook misalignment*, *cost concerns*, *student confusion*, *teaching around the commercial textbook*. These codes led to theme one: *shared dissatisfaction as an agent for faculty collaboration*. 2) The second insight was that knowledge creation required surfacing of *implicit epistemological commitments*. Codes included *what counts as research*, *student needs*, *values of learning, methods hierarchy*, *curriculum disagreements.* These codes led to theme two: *Negotiation of disciplinary and pedagogical assumptions*. 3) The third insight was that authorship shifted from individual contribution to collective responsibility. Codes included key phrases such as *we language, shared outcomes, alignment across sections, and editing each other's work.* These codes led to theme three: *Emergence of collective pedagogical ownership*. 4) The fourth insight was that the textbook was understood as a process, not a finished product. Codes included: *future revisions, classroom feedback, adaptability, open licensing affordances, living materials*. These codes led to theme four: *Open textbook as a living, revisable knowledge artifact*.

To further explicate how these themes functioned as knowledge creation, the initial four findings were interpreted using the SECI model as part of the subsequent data analytics. The SECI framework provided an explanatory structure for understanding how the identified themes unfolded through cycles of *socialization*, *externalization*, *combination*, and *internalization*. This process highlighted how faculty collaboration process functioned as the primary mechanism through which open knowledge was generated, legitimized, and sustained [19]. The four themes aligned closely with the SECI model, and reflected how faculty engaged in sustained sense-making and professional learning rather than discrete content production as follows: 1) *Socialization: Sharing Tacit Pedagogical Knowledge*. The inductive theme, *shared dissatisfaction*, was visible during this phase. Faculty shared experiential knowledge regarding teaching challenges and disciplinary assumptions through dialogue and reflection. The project began with faculty conversations centered on *shared dissatisfaction* with the existing commercial textbooks. Through dialogue, participants exchanged tacit knowledge regarding individual teaching philosophies, recurring student difficulties, and implicit assumptions about graduate level educational research. These conversations established a shared problem space and created conditions for mutual trust and intellectual risk-taking. While the creation of content was a shared responsibility, the division of labor included a designated lead author/editor responsible for process monitoring. The lead editor acted as the *metacognitive anchor*, ensuring that individual chapters/sections remained aligned with the overarching learning objectives and the final synthesis met rigorous graduate-level standards. Moreover, during this phase, the group selected a user-friendly platform, *Pressbooks,* to create their digital book which allowed simultaneous editing and version control [30, 31]. 2) *Externalization: Articulating Implicit Understandings.* The *negotiations of assumptions* theme was visible in the *externalization* phase. Implicit understandings were articulated into learning outcomes, chapter structures, and pedagogical features through collaborative planning [20]. As discussions progressed, faculty began externalizing tacit insights into explicit forms, including learning objectives, organizing frameworks, and pedagogical features. Negotiating shared language required making underlying epistemological assumptions visible, thereby transforming personal teaching knowledge into collectively owned conceptual structures. 3) *Combination: Systematizing Explicit Knowledge*. The *collective ownership* theme was visible in this phase. Individual contributions were integrated into a coherent textbook structure aligned with program outcomes and supported by open publishing infrastructure [30]. Explicit contributions were integrated into a coherent textbook structure aligned with program outcomes. Following the draft textbook completion, faculty collaboratively refined chapter organization, standardized terminology, and incorporated reflective and applied learning features to support iterative authorship, accessibility, open licensing. Finalized textbook was peer-reviewed by two external faculty. Once the textbook was approved and passed the review phase, it was added to the university

scholarship repository to be accessed freely by students. 4) *Internalization: Teaching, Using, and Revising*. The *living textbook* theme was visible in this phase for faculty internalized the shared knowledge through classroom implementation, revision, and ongoing use [19]. The textbook also became freely available in the *Open Textbook Library* repository for adoption or adaptation by other institutions. Classroom use prompted further reflection and revision, allowing explicit knowledge embedded in the textbook to be reinternalized through instructional practice. This ongoing cycle reinforced shared pedagogical commitments and positioned the textbook as a living curricular resource rather than a static product.

5. Conclusion and Implications

This study examined faculty-driven OER textbook development through the lens of the SECI model of knowledge creation, foregrounding collaboration as the central mechanism through which open knowledge was generated. Rather than conceptualizing open textbook creation as a linear authorship task, the findings demonstrated that the process functioned as a dynamic cycle of collective inquiry in which faculty socialized tacit pedagogical expertise, externalized shared assumptions, combined explicit contributions into a coherent curricular resource, and internalized the resulting knowledge through teaching and iterative revision. These findings extend the existing OER literature by shifting analytic focus from adoption outcomes and cost savings to the *epistemic labor* of open textbook creation. While prior research has emphasized the economic and access-related benefits of OER [6-9], this study demonstrated that faculty-created OER textbooks also operate as sites of professional learning, curricular alignment, and shared meaning-making [30, 32]. In this sense, open textbook development aligns closely with principles of open pedagogy, not merely because of open licensing but because of the collaborative processes through which knowledge is negotiated and legitimized [12–15]. Applying the SECI model provides an explanatory framework for understanding how faculty expertise becomes institutional knowledge. The iterative movement between tacit and explicit knowledge observed in this study reflects findings from organizational learning research while extending them into the domain of higher education curriculum design [17-22]. Importantly, the SECI framework highlights that openness alone does not produce knowledge; rather, it is the structured interaction among participants that enables transformation of individual insight into shared, sustainable resources.

5.1 Implications for Students

Faculty-created open textbooks based on empiricism can eliminate certain barriers present for students which come with commercial textbooks. These freely available resources can provide access to materials, eliminate restricted availability, address rising textbook costs, and improve inequities. Eliminating such barriers can also affect retention, and serve as a marketing tool for recruitment.

5.2 Implications for Faculty, Researchers and Institutions

The findings also suggest that open textbook development can serve as a meaningful form of scholarly and pedagogical engagement. Collaborative OER creation offers opportunities for reflective practice, disciplinary dialogue, and alignment across multi-section courses; outcomes that are often difficult to achieve through isolated course design. Framing open textbook work as collective inquiry rather than content production may also lower perceived barriers to participation by emphasizing learning and shared ownership over technical expertise [22].

To conclude, faculty-created open textbooks [30, 32] represent more than alternatives to commercial content; these digital sources embody a reconfiguration of how academic knowledge is generated, shared, and sustained. By framing open textbook development through the SECI model, this study demonstrates that collaborative knowledge creation lies at the heart of open education practice. Supporting such processes may enable institutions to move beyond adoption toward more equitable, participatory, and sustainable cultures of openness in higher education.

6. Limitations and Future Directions

While this study focused on a single case within one institutional context, its purpose was analytic rather than generalizable in a statistical sense.

Future research could extend this work through comparative studies, longitudinal designs, or mixed-methods approaches examining learning outcomes alongside faculty experiences. Additional

inquiry is also needed to explore how power, positionality, and institutional reward structures shape participation in open knowledge creation. Furthermore, future research might examine how SECI-informed collaboration unfolds across disciplinary contexts, includes students as knowledge co-creators, or evolves over multiple revision cycles of open textbooks.

REFERENCES

[1] Senack E., *Fixing the broken textbook market*. Student PIRGs; 2014.
[2] Van Allen J, Katz S., Examining the use of open educational resources and renewable assignments. *Open Praxis*. 2024;16(2):62–76.
[3] UNESCO. *Recommendation on Open Educational Resources*. Paris; 2019.
[4] Wiley D, Hilton JL., The 5R permissions of open educational resources. In: *International Handbook of Open, Distance and e-Learning*. Springer; 2018. p. 135–147.
[5] Hilton J., Open educational resources and college textbook choices. *Educ Technol Res Dev*. 2016;64:573–590.
[6] Colvard NB., Watson CE, Park H. The impact of OER on student success. *IRRODL*. 2018;19(4).
[7] Grimaldi PJ., et al. Do OER improve student learning? *Educ Policy Anal Arch*. 2019;27(36).
[8] Jhangiani RS., Pragmatism vs. idealism and OER. Ubiquity Press; 2017.
[9] Paskevicius M., Open pedagogy and knowledge co-creation. *Educ Technol*. 2020;60(3):33–39.
[10] Van Allen J., Katz S., Teaching with OER during pandemics and beyond. *J Multicult Educ*. 2020;14(3/4):209–218.
[11] Lambert SR., Social justice and OER. *J Learn Anal*. 2018;5(3):225–235.
[12] DeRosa R., Jhangiani RS. Open pedagogy. *Educ Technol*. 2017;57(3).
[13] Wiley D., Hilton JL., OER-enabled pedagogy. *IRRODL*. 2018;19(4).
[14] Hilton III JL., Robinson TJ, Wiley D, Ackerman JD. Cost-savings achieved in two semesters through the adoption of open educational resources. IRRODL [Internet]. 2014 Apr. 1 [cited 2026 Apr. 9];15(2).
[15] Morales LDG., et al. Assessment of open educational resources instruments: a systematic review. JiME, 2026-03, Vol.2026 (1), p.8.
[16] Ndaago AI.,Kankam PK., Bentil W., Awareness and knowledge of OER. *Sci Direct*. 2025; 28:e02659.
[17] Maloy R., Trust T., Empowering college students to be OER creators and curators. Faculty Focus.2022. Feb 7.
[18] Trust T., Maloy RW., Edwards S., College student engagement in OER design projects: impacts on attitudes, motivation, and learning. *Active Learning in Higher Education*. 2022;24(3). https://doi.org/10.1177/14697874221081454
[19] Nonaka I., Takeuchi H., *The knowledge-creating company*. Oxford University Press; 1995.
[20] Nonaka I., Toyama R., Konno N.. SECI and knowledge creation. *Long Range Plan*. 2000;33:5–34.
[21] Zhou C., et al. SECI model and creativity. *Front Psychol*. 2025.
[22] Morris PWG., Loch ICA., Knowledge creation and dissemination (organizational learning) in project-based organizations. Paper presented at: PMI® Research Conference: Innovations; 2004 Jul 11-14; London, England. Newtown Square (PA): Project Management Institute; 2004
[23] Yin RK, *Case study research*. 6th ed. Sage; 2018.
[24] Thomas G., *How to do your research project*. 5th ed. Sage; 2026.
[25] Saldaňa J., *The coding manual for qualitative researchers*. 3rd ed. Sage. 2016.
[26] Lincoln YS., Guba EG., *Naturalistic inquiry*. Sage; 1985.
[27] Creswell JW., Guetterman TC., *Educational research: planning, conducting, and evaluating quantitative and qualitative research.* 6th ed. Pearson; 2018.
[28] Braun V., Clarke V., Thematic analysis. *Qual Res Psychol*. 2006;3:77–101.
[29] Guest G., MacQueen KM., Namey EE., *Applied thematic analysis.* Sage. 2012.
[30] Open Education Network. Maintaining and updating OER. 2025.Pressbooks.
[31] Pressbooks: The Leading Platform for Digital Publishing & OER [Internet]. Montreal: Pressbooks; [cited 2026 Apr 13]. Available from: https://pressbooks.com/
[32] Olt PA., Dalat Ward Y.., Splichal K, Dowda RL., Isom E., Understanding and doing research in education & the social sciences. All Open Educational Resources. 2025;14. Available from: https://scholars.fhsu.edu/all_oer/14 doi: 10.58809/CEPF8532