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Reconstructing Undergraduate Dissertations: A Conceptual Framework for Collaborative Capstones, Employability, and Societal Impact

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Abstract

Background and Aim: Traditional undergraduate dissertations often prioritize individual scholarly inquiry, which, while fostering academic autonomy, can underutilize opportunities for collaborative skill development and generate research outputs with limited broader community utility. This conceptual paper proposes a collaborative group-project framework for reimagining undergraduate dissertations to support graduate employability and produce tangible institutional and community legacies. The study aims to articulate a theoretically grounded framework, provide a structured implementation model, and derive testable propositions regarding employability competencies and institutional outcomes.

Materials and Methods: This paper adopts a conceptual framework development approach, drawing on an integrative literature synthesis of competency-based education, experiential learning theory, and graduate capital frameworks. The methodology synthesizes theoretical and empirical literature from major academic databases (Scopus, Web of Science, and Google Scholar) to construct an operational model suited for higher education capstone reform.

Results: The resulting framework articulates four primary components: (1) curriculum reconstruction for embedded competency building, (2) group-based collaborative dissertation structures, (3) tangible legacy outputs (such as functional prototypes, policy frameworks, and community resources), and (4) operational implementation protocols addressing team formation, dual-mode assessment, faculty mentorship, and governance risks. Student employability enhancement and institutional legacies are modeled as theorized outcomes requiring empirical evaluation rather than proven effects.

Conclusion: The proposed framework provides a theoretically sound basis for pilot implementation and empirical evaluation, offering higher education leaders a structured alternative or complementary pathway to conventional individual dissertations. Principal limitations include the absence of empirical field validation, highlighting the need for future comparative and longitudinal research.

Keywords: Collaborative Capstones, Competency-based Education, Curriculum Reconstruction, Graduate Employability, Higher Education Management, Tangible Legacy.

Introduction

Higher education institutions are increasingly expected to help students connect disciplinary knowledge with the skills needed in professional and civic life. Employers and graduating students alike identify critical thinking, communication, and teamwork as important aspects of career readiness (Collins, 2022). Undergraduate research offers one way to make that connection: students can investigate questions, apply disciplinary methods, and participate actively in the production of knowledge (Healey & Jenkins, 2009).

The undergraduate dissertation is a valuable form of this experience. It gives students sustained responsibility for defining a question, conducting an inquiry, and presenting an evidence-based argument. Research on final-year students' experiences shows the importance of the autonomy built into dissertation work (Todd et al., 2004). At the same time, a dissertation designed solely as an individual written exercise may offer fewer structured opportunities to collaborate with peers, respond to external stakeholders, or communicate findings beyond assessment. These are possibilities for curriculum design rather than shortcomings inherent to every individual dissertation. Institutions could therefore retain the dissertation's intellectual rigor while creating opportunities for team-based inquiry and work on questions relevant to communities or professional practice.

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Such changes should not be presented as a direct solution to graduate underemployment. Young people's employment prospects are shaped by wider economic conditions and labour-market structures as well as education and training (International Labour Organization, 2022). Dissertation design is nevertheless a curricular choice through which institutions can give students more opportunities to practise and demonstrate transferable capabilities. The question is how to broaden the dissertation's forms and audiences while preserving the depth of inquiry that makes it educationally valuable.

Objectives

The objectives of this paper are threefold:

1. To articulate a theoretically grounded conceptual framework for collaborative undergraduate dissertations that produce tangible legacy outputs.
2. To specify institutional implementation protocols, including team formation, dual assessment, faculty mentorship, quality assurance, and risk governance.
3. To derive testable propositions regarding student employability capital, institutional value, and community engagement to guide future empirical research.

Literature Review

This framework brings together three perspectives on undergraduate capstone design: competency-based education (CBE), experiential learning theory (ELT), and graduate capital. Each addresses a different question: what students should demonstrate, how they learn through a project, and what resources they may develop for life after graduation.

2.1 Competency-Based Education

Competency-based education places emphasis on what learners can demonstrate through assessment (Voorhees, 2001). Applied to a capstone, this perspective calls for clearly defined criteria for research practice alongside criteria for the final academic product. Depending on the project, students might demonstrate methodological judgment, technical execution, communication, and collaboration through research plans, documented decisions, presentations, and completed deliverables. These competencies require explicit assessment criteria; participation in a team alone does not establish that each student has developed them.

2.2 Experiential Learning Theory

Kolb's (2015) experiential learning theory describes learning as a process involving concrete experience, reflective observation, abstract conceptualization, and active experimentation. A capstone addressing a practical problem can create opportunities for these processes when students investigate the context, test an approach, reflect on feedback, and revise their work. The educational value depends on how the experience is structured. In particular, reflection and opportunities to apply what has been learned help connect project activity to disciplinary understanding.

2.3 Graduate Capital

Tomlinson (2017) proposes five forms of capital relevant to graduate employability: human, social, cultural, identity, and psychological capital. An individual dissertation can develop human capital through disciplinary knowledge and research skills. A collaborative project involving external stakeholders *may also* give students opportunities to build professional relationships, understand workplace practices, develop a professional sense of self, and respond to setbacks. These outcomes should be investigated rather than assumed: access to stakeholders, the quality of supervision, and students' roles in a project can affect what each student gains.

2.4 Theoretical Integration and Governance

Together, the three perspectives provide a basis for designing and evaluating capstones. ELT explains the learning process; CBE informs the definition and assessment of demonstrable abilities; and graduate capital broadens attention to possible outcomes beyond the final submission. Implementing this approach also requires clear arrangements for supervision, assessment, and academic standards. Wisker (2012) emphasizes the importance of effective supervision across undergraduate research projects. For collaborative capstones, institutions should additionally specify how individual contributions will be assessed, how external partners will participate, and how project demands will fit

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within supervisory capacity. These are design requirements proposed by the present framework, rather than outcomes established by the three theories themselves.

Methodology

This study utilizes a conceptual framework development approach through an integrative literature synthesis. Rather than reporting a formal systematic empirical review, this paper synthesizes conceptual, theoretical, and pedagogical literature to construct a novel institutional framework. Literature was identified via database searches across Scopus, Web of Science, and Google Scholar using combinations of keywords including undergraduate dissertation, collaborative capstone, competency-based education, experiential learning, and graduate employability. Sources were evaluated based on theoretical relevance, educational rigor, and applicability to higher education curriculum governance. The analytical process involved three iterative phases: (1) Thematic synthesis of existing critiques and strengths of traditional vs. collaborative capstone models. (2) Conceptual mapping of core structural pillars, mapping learning theories to practical deliverable types. (3) Formulation of operational protocols, risk governance frameworks, and testable research propositions for institutional adoption.

AI Tools Disclosure: AI-assisted writing tools (Gemini / ChatGPT) were utilized during manuscript preparation solely for structural organization, prose refinement, and standardizing citations against APA 7th edition guidelines, under full editorial oversight by the author.

Results

1. Framework Architecture: The proposed framework structures the collaborative dissertation into three primary phases: Phase 1 (Core Pillars), Phase 2 (Implementation & Governance Protocols), and Phase 3 (Theorized Outcomes).

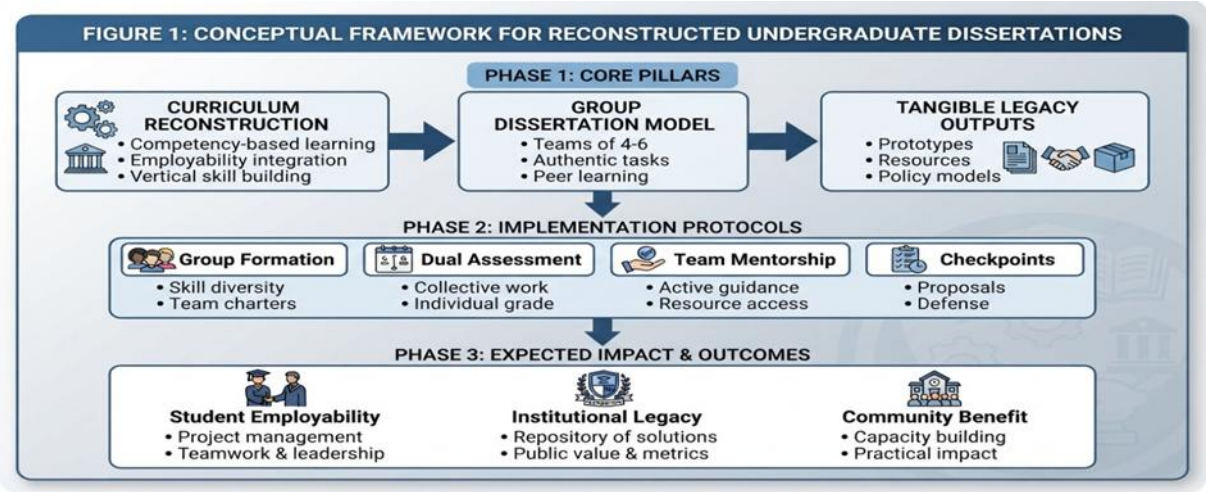


Figure 1 Framework Architecture

2. Operational Deliverables ("Tangible Legacies"): "Tangible legacy" is operationalized as authentic, functional outputs designed for ongoing post-academic utilization. Deliverables are categorized into: Functional Prototypes: Software applications, instructional tools, physical design solutions. Institutional & Policy Frameworks: Evidence-based administrative strategies, regional policy white papers.

Community & Cultural Assets: Local history archives, needs assessment databases, educational toolkits.

3. Implementation Protocols & Risk Governance

To ensure institutional feasibility and academic integrity, the framework incorporates specific operational safeguards: (1) Team Formation & Sizing: Teams of 3 to 5 students are formed based on

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complementary skill sets and interdisciplinary balance, governed by a binding Team Charter outlining roles and conflict management protocols. (2) Dual-Mode Assessment Model: To mitigate "free-riding" and ensure individual accountability, grading is split: 50% Group Deliverable (rubric-evaluated project quality, rigor, and utility) and 50% Individual Contribution (verified via individual viva examinations, reflective learning logs, confidential peer-evaluation factors, and milestone logs). (3) Faculty Mentorship & Workload: Mentorship shifts from single-student supervision to cohort facilitation, utilizing milestone checkpoints (Proposal Defense, Mid-Term Audit, Final Public Showcase & Viva).

Discussion

Comparative Analysis

The collaborative capstone is best understood as an additional pathway within undergraduate research, particularly for applied, professional, and interdisciplinary programmes. An individual dissertation gives a student sustained responsibility for an inquiry and can support autonomy and disciplinary depth (Todd et al., 2004). A collaborative capstone can retain rigorous inquiry while adding opportunities to coordinate work with peers and respond to an external stakeholder. Reviews of capstone practice and research on client consultancy projects show that such arrangements can connect academic work with professional practice, although their design varies across disciplines (O'Leary, 2015; Tenhunen et al., 2023).

The two formats should therefore be compared against their intended learning outcomes, rather than treated as interchangeable assignments. Competency-based education calls for evidence of what each student can demonstrate (Voorhees, 2001), while experiential learning theory draws attention to the roles of experience, reflection, and revision (Kolb, 2015). Research on undergraduate inquiry likewise supports students' active participation in research (Healey & Jenkins, 2009). Within this framework, a collaborative capstone has a particular rationale when a question benefits from several kinds of expertise or engagement with a community or professional partner. An individual dissertation remains appropriate when sustained independent inquiry is the central objective.

Potential benefits require qualification. Tomlinson's (2017) graduate capital framework suggests that stakeholder contact and teamwork *could* create opportunities to develop social, identity, and psychological capital alongside disciplinary knowledge. Evidence from service-learning research supports examining personal and social outcomes, but those studies do not establish that every collaborative capstone will produce the same effects (Conway et al., 2009; Yorio & Ye, 2012). Nor should improved employability be inferred from a project experience alone: labour-market conditions also shape graduates' opportunities (International Labour Organization, 2022).

Testable Propositions for Future Empirical Validation

Because this paper proposes a conceptual framework, the following statements are hypotheses for future research, not findings of the present study.

Proposition 1: Graduate capital. After accounting for students' starting levels and relevant characteristics, students in collaborative capstones involving external stakeholders will show greater gains in social capital and psychological capital than comparable students completing individual dissertations. Tomlinson's (2017) model defines the outcomes of interest; prior research on service-learning provides a reason to investigate them (Conway et al., 2009; Yorio & Ye, 2012). A study should collect measures before and after the capstone, record the nature and frequency of stakeholder contact, and distinguish changes in self-reported confidence from evidence of actual professional relationships.

Proposition 2: Assessment fairness and reliability. A combination of a common project rubric, an individual oral examination, and structured peer assessment will distinguish individual achievement more effectively than a shared team mark alone, while maintaining acceptable agreement between assessors. Assessment that prepares students to judge work in context has a broader educational purpose (Boud & Falchikov, 2006), and timely feedback can guide improvement during a project (Hattie & Timperley, 2007). Peer-assessment studies offer approaches to identifying uneven contributions, but peer ratings can also be affected by bias and group dynamics (Loughry et al., 2014; Shishavan & Jalili, 2020). This proposition should therefore be tested through assessor agreement, differences between individual and team marks, documented contributions, and student reports of fairness. The proposed

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combination of methods has not yet been shown by these sources to guarantee reliability or eliminate free-riding.

Proposition 3: Supervisory workload. With shared guidance and clearly defined project roles, team-based capstones will require fewer faculty hours per student for repeated administrative instruction than individual dissertations, while shifting a larger share of supervisory time toward methodological and project-level feedback. Effective supervision remains necessary in either format (Wisker, 2012). This proposition calls for time-use records that separately measure administration, individual feedback, team meetings, methodological support, and coordination with external partners. Total workload may increase if partner management and conflict resolution outweigh savings from shared guidance; it should not be presumed to fall.

Taken together, the propositions provide a basis for evaluating the framework across educational outcomes, assessment quality, and institutional feasibility. A comparative study should use equivalent academic standards for both pathways, document how students enter each pathway, and examine variation by discipline and project design. These safeguards would help determine for whom and under what conditions collaborative capstones add value.

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Knowledge Contribution

This paper contributes a conceptual framework for designing collaborative undergraduate capstones as an additional pathway alongside individual dissertations. It brings competency-based education, experiential learning theory, and graduate capital into a single account of what students demonstrate, how they learn through a project, and which broader capabilities the experience may help them develop.

The framework's second contribution is to connect educational aims with implementation. It specifies how team roles, stakeholder involvement, tangible deliverables, supervision, and individual assessment can be considered together when designing a capstone. This makes the proposed approach more concrete than a general call for collaborative learning, while preserving the need to assess each student's research achievement.

Finally, the paper identifies propositions that can be tested empirically. These concern changes in graduate capital, the fairness and reliability of combined group and individual assessment, and the distribution of faculty supervisory time. These are proposed contributions to research and curriculum design, not demonstrated outcomes. Comparative studies are needed to establish whether collaborative capstones add value, under which conditions, and for which students and disciplines.

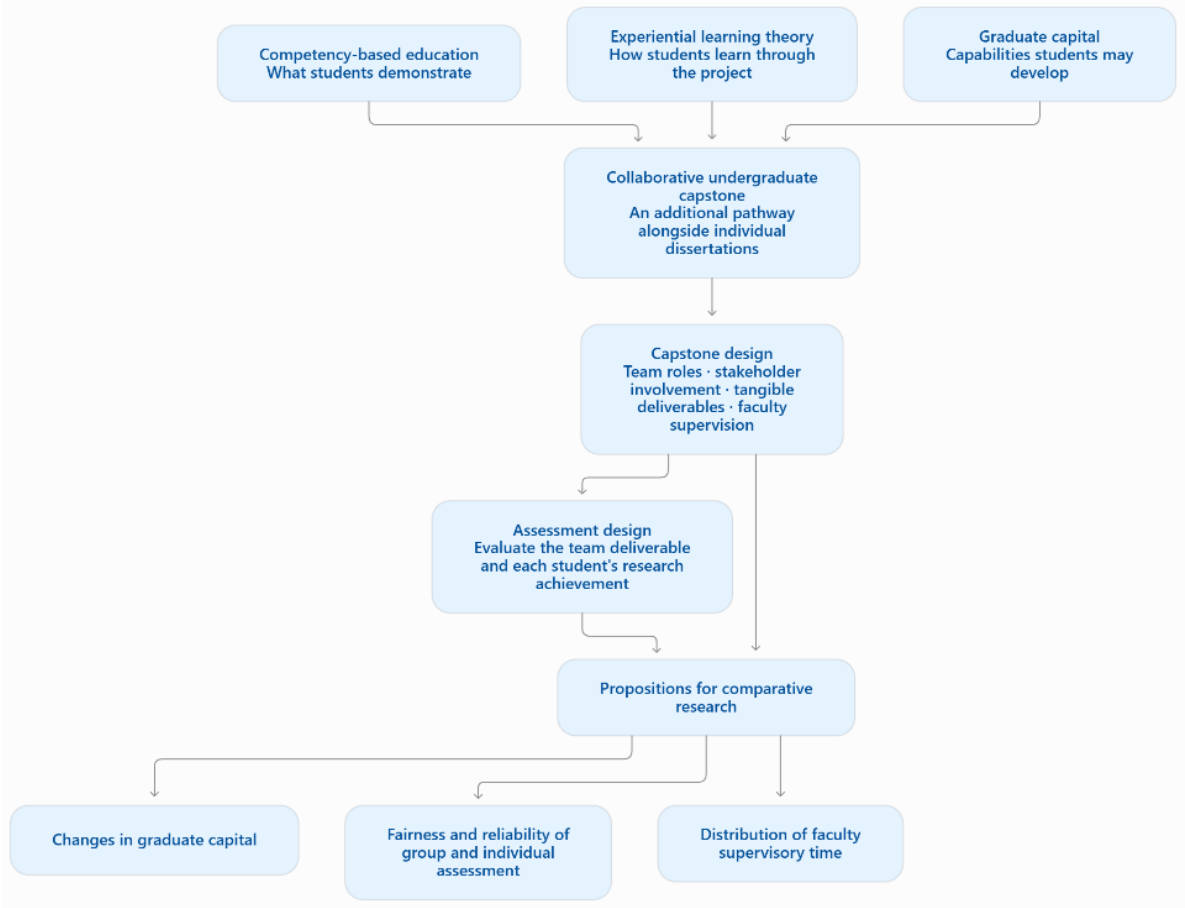


Figure 2 *Conceptual Framework for Collaborative Undergraduate Capstones*

Note. The arrows show how the theoretical foundations inform capstone design and how that design generates questions for empirical testing.

The framework connects what students should demonstrate, how they learn through collaborative project work, and which capabilities they may develop. It translates these educational aims into decisions about team roles, stakeholder involvement, deliverables, supervision, and assessment. Assessing the team deliverable alongside each student's research achievement preserves individual accountability within a shared project. The three proposed areas of investigation provide a

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basis for comparing collaborative capstones with individual dissertations and examining where, for whom, and under what conditions the collaborative pathway adds value.

Recommendations

1. For University Leadership: Initiate controlled pilot projects within applied disciplines before department-wide scaling; align faculty workload accounting with group facilitation.
2. For Quality Assurance & Accreditation Bodies: Recognize tangible legacy deliverables and authentic assessment rubrics as valid scholarly equivalents to bound monographs.
3. For Educational Researchers: Execute empirical mixed-methods studies comparing graduate career trajectories, employer satisfaction, and assessment validity between individual and group capstone cohorts.

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