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From silos to sharing: An Open Educational Resources-based framework for consumer financial education

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Orientation: Consumer financial education (CFE) provision remains duplicated, fragmented and inconsistent in quality despite global and national mandates for coordinated action. CFE can be understood as a grand challenge requiring system-wide collaboration, supported by openness and shared value creation.

Research purpose: To develop a framework for the coordinated, cooperative and collaborative (3C) development of CFE resources, with Open Educational Resources (OER) as the enabling mechanism. The framework moves ecosystem actors from aligning goals (coordination), to sharing purpose and effort (cooperation), to jointly producing openly licensed resources (collaboration).

Motivation for the study: Transnational policy frameworks call for accessible, inclusive financial literacy education, yet practical mechanisms for jointly developing and sharing CFE content remain underdeveloped.

Research design, approach and method: A conceptual design was adopted. Literature on systems thinking, the Quintuple Helix Innovation Model, collaboration theory and open educational practices was purposively synthesised through an abductive analytic process.

Main findings: Duplication persists because collaboration, although mandated, is not operationalised. Open practices and OER, through open licensing, shared workflows and reuse, provide a viable mechanism for 3C resource development. The framework comprises three iterative phases: foundational alignment, collaborative resource development, and sustainability and continuous improvement.

Practical/managerial implications: The framework helps the financial services sector reduce costs, prevent duplication, improve content quality and meet regulatory expectations.

Contribution/value-add: The study offers the first integrated conceptual model linking systems thinking, collaboration theory and OER in CFE, providing a practical pathway for sustainable, shared value resource development.

Keywords: consumer financial education; financial literacy; Open Educational Resources; systems thinking; financial services sector; collaboration frameworks.

Introduction

Although financial literacy is widely recognised as one of the foundations of personal economic stability and well-being, disturbing statistics persist about individuals' inability to safeguard their financial futures (Gallo & Sconti 2024; Lusardi & Mitchell 2014). Evidence shows that low levels of financial literacy are prevalent worldwide (Lusardi & Messy 2023). The most recent Organisation for Economic Co-operation and Development (OECD) Adult Financial Literacy study (2023) revealed that, on average, only one-third of adults in participating countries achieved the minimum targeted score for financial literacy. Financial literacy broadly refers to an individual's ability to understand finance, enabling them to make informed and effective decisions based on their financial knowledge (National Treasury 2013). Not only is low financial literacy a concern for individual financial well-being, but it also impacts household financial stability through debt management and savings decisions (Zaimovic et al. 2023). At the macro level, financial literacy contributes to economic growth by enabling individuals to make more informed financial decisions.

Improving financial literacy is inextricably linked to financial education (Mvunabandi 2025). This article uses the term consumer financial education (CFE) to denote financial education

aimed at the general public, as distinct from formal financial education embedded in qualifications. Despite policy and financial education efforts, structural and systemic obstacles continue to hinder progress, and the low levels of financial literacy reported by the OECD (2023) underline the need for expanded CFE provision. Consumer financial education empowers individuals by increasing their knowledge, skills and confidence in an increasingly diverse, continually changing and complex financial system (ArockiaDass & Nithya 2025; OECD 2015). Consumer financial education, which is well-documented, is 'the process by which individuals improve their understanding of financial products, concepts and risks, developing the skills and confidence needed to make informed decisions and enhance their financial well-being' (OECD 2005). However, achieving and maintaining financial literacy through CFE is challenging as a result of the continuous evolution and increasing complexity of financial products and technological advancements (OECD 2025). Given this complexity and dynamic environment, the effectiveness of CFE depends on how resources are designed, coordinated and delivered.

From the delivery perspective, CFE is characterised by a lack of coordinated governance, overlapping mandates and fragmented provision, resulting in duplication of effort, duplication of educational initiatives across different institutions and the inefficient use of limited financial and other resources (De Clercq 2026). The duplication of CFE initiatives aimed at improving financial literacy inflates total national and institutional spend and diminishes impact, as limited resources (budgets and human) are repeatedly channelled into parallel rather than complementary educational initiatives. These inefficiencies are particularly evident in CFE, where multiple institutions produce similar materials in isolation (De Clercq 2026). The duplication and fragmentation of educational resources and initiatives represent a systemic inefficiency within the CFE ecosystem.

Given these inefficiencies, collaboration becomes central to improving CFE outcomes. The issue is that even though financial education is mandated or legislated in most financial sectors, there is little evidence of formally coordinated approaches that leverage shared resources (De Clercq 2026). Even though there are clear policy commitments to collaboration, mechanisms to enable coordinated, shared resource development remain underdeveloped. Many countries have developed national CFE strategies that designate coordination bodies to oversee CFE. The challenge, therefore, is not a lack of governance but rather the enactment of collaboration. Ng'ambi and Luo (2013) observe that the difficulty of sustaining collaborative practices often stems from institutions' struggle to transition from individual social behaviour to a social practice in which knowledge sharing becomes a norm.

This article proposes that open practices and open educational resources (OER) can support this transition, and that adopting open licensing will facilitate sharing. Open educational practices constitute a collaborative environment that enables the creation of OER. Open Educational Resources are freely accessible teaching and learning materials designed for reuse and adaptation, and open licences are the legal mechanisms that provide the necessary permissions to share and modify content without losing traditional copyright protections while also legally avoiding certain copyright restrictions. To date, research on open practices and OER has focused primarily on formal education. No existing literature integrates OER and open practices into the collaborative development of CFE resources or examines their potential to reduce duplications and improve systemic efficiency within this sector. There is a gap, therefore, leaving their potential in CFE underexploited.

This conceptual article thus addresses the inefficient, uncoordinated duplication of CFE resources. It proposes collaboration grounded in open practices and OER and presents a novel OER-based, coordinated, cooperative and collaborative (3C) framework. By reducing the duplication of both expenditure and CFE resources, the framework aims to fill content gaps, enhance regulatory compliance and improve financial inclusion outcomes, with the ultimate goal of developing shared, adaptable, high-quality resources across the financial education ecosystem. Accordingly, this article is guided by the following research question: *How can an OER-based 3C framework address systemic duplication and inefficiencies in CFE ecosystems to support sustainable, shared value resource development?*

The contribution of this article is therefore a mechanism rather than a diagnosis. De Clercq (2026) establishes that the South African CFE ecosystem is fragmented and that collaboration is mandated but does not specify how collaboration is to be enacted. Sanchez-Gordon and Luján-Mora (2015) demonstrate an OER lifecycle for corporate training, but within a single organisation rather than across competing institutions. Tlili et al. (2020) identify the community model as a route to OER sustainability, yet treat trust, shared standards and governance as preconditions rather than as outcomes to be built. The 3C framework connects these strands by specifying how open licensing and open practice can operationalise mandated but unimplemented collaboration across institutional boundaries within a regulated ecosystem.

After outlining the research methods and design and presenting the conceptual foundations, in which open practices and OER are examined to show how they can support shared resource development, the results advance the core contribution of this article by proposing an OER-based 3C framework. This framework integrates insights from systems thinking, collaboration and openness to offer a novel conceptual model for improving efficiency, alignment and shared value creation in CFE. The discussion positions this contribution relative to existing work and sets out limitations, and the conclusion reflects on its significance.

Research methods and design

This conceptual study entailed the 'assimilation and combination of evidence' built on existing concepts and theories (Jaakkola 2020:19) to develop a framework for understanding how open practices and OER can address the inefficient, uncoordinated duplication of CFE resources. Jaakkola (2020) identifies four primary approaches to conceptual article design: (1) theory synthesis, (2) theory adaptation, (3) typology development and (4) model building. The study most closely aligns with the model building approach, which aims to integrate conceptually distinct bodies of literature into a new, coherent explanatory structure. Model building is appropriate when no existing framework adequately addresses the research problem and when the primary contribution is the articulation of new conceptual relationships rather than the testing of hypotheses (Jaakkola 2020; Rocco & Plakhotnik 2009). Given the complexity, scale and multiactor nature of CFE systems, a conceptual study is particularly suited to integrating diverse theoretical perspectives and generating a new explanatory framework. In this study, literature was purposively selected from four domains central to the research: (1) CFE, (2) systems thinking, (3) collaboration and (4) open practices or OER.

Purposive selection in conceptual research is an established practice in which the researcher selects theoretical material based on its conceptual relevance to the research problem rather than through systematic database searches designed to achieve bibliographic completeness (Gilson & Goldberg 2015; Jaakkola 2020). Literature from each domain was included where it met one or more of the following criteria: (1) it directly theorised the research problem domain (CFE fragmentation, collaborative resource development or open education); (2) it provided foundational theoretical constructs (systems thinking, the Quintuple Helix Innovation Model (5HM), collaboration lifecycle models); or (3) it offered empirical or applied evidence relevant to the framework's design assumptions. These bodies of literature were identified for their relevance in addressing systemic inefficiencies and for their potential to inform an OER-based 3C framework.

A conceptual approach is appropriate given the absence of an established theoretical framework for OER-based collaborative CFE content development. This approach aims to link previously unconnected concepts of CFE, collaboration, open practices and OER. This absence of an existing framework itself is a justification for conceptual model building: Where a gap exists not merely in empirical evidence but in the theoretical architecture needed to make sense of a problem, framework development constitutes a legitimate and significant scholarly contribution (Gilson & Goldberg 2015; Rocco & Plakhotnik 2009).

The development of the proposed 3C framework followed an abductive analytical process in which insights from collaborative lifecycle models, OER implementation scholarship and systems theory were iteratively combined. This approach enabled the inference of conceptual relationships and the construction of a coherent framework aligned with the research question.

While this article draws on a South African national financial education ecosystem, the conceptual argument is not geographically bound. South Africa is used as an illustrative context rather than as a unit of analysis: Its well-documented CFE ecosystem with a coordinating body (De Clercq 2026; Sibanda & Sibanda 2016), overlapping mandates, voluntary collaboration and product neutrality (Financial Sector Conduct Authority [FSCA] 2024) and the OER policy environment (Department of Higher Education and Training [DHET] 2017) make it a theoretically useful case for grounding the framework's assumptions.

The 3C framework's core logic, that open licensing and open practice can operationalise mandated but unimplemented collaboration within regulated multiactor ecosystems, is applicable to any national or sector-level CFE ecosystem in which similar structural conditions exist, including overlapping institutional mandates, regulatory conduct obligations and a shared societal goal of financial inclusion. This conceptual approach provides a coherent basis for addressing the research question by integrating previously fragmented knowledge into a unified framework that guides 3C resource development within CFE ecosystems.

As a conceptual study, this article does not claim empirical verification of the proposed 3C framework. The contribution is theoretical: The framework provides a structured, evidence-informed conceptual model that articulates how open practices and OER operationalise collaboration within CFE ecosystems. The value of conceptual contributions in management and economic research lies in their capacity to organise existing knowledge, identify gaps and provide researchers and practitioners with a testable and applicable theoretical structure (Gilson & Goldberg 2015; Jaakkola 2020).

The primary limitation of this design is that the framework's assumptions, including the presence of a national coordinating body, institutional willingness to collaborate and sufficient OER awareness among financial services actors, have not been empirically validated. These assumptions are grounded in the literature but remain untested in practice. The article acknowledges this limitation and identifies empirical validation as the next step for future research. A second limitation is that the literature synthesis, while purposive and theoretically grounded, is not exhaustive. Adjacent fields such as knowledge management, platform economics and commons governance could further enrich the framework in future iterations. A third limitation is that the framework is developed against a single illustrative context; its transferability to other national ecosystems and to other regulated sectors has not been demonstrated.

Conceptual foundations

The scope and complexity of consumer financial education

Financial literacy is complex and multifaceted; it is influenced, among others, by gender, culture, education level and access (ArockiaDass & Nithya 2025). These diverse factors affect delivery, contextual relevance, pedagogical choices and the design of CFE interventions. Additionally, CFE encompasses multiple interrelated domains, including, but not limited to, financial literacy, financial inclusion, consumer protection, fintech development, digital literacy, behavioural economics, household well-being and inequalities (De Clercq 2026). Consumer financial education content includes, for example, money management (budgeting, saving, credit and debt management), long-term financial planning, investments and life-stage planning, digital literacy and capabilities, and legal concepts, among others.

The breadth and interdependence of these domains create a need for coordinated content development that draws on diverse forms of expertise. It is evident that CFE and ultimately improved financial literacy cannot be achieved through disjointed and fragmented offerings. Neither can it be addressed by one single institution or organisation.

Consumer financial education as a grand challenge

When considered holistically, CFE can be characterised as a grand challenge. Grand challenges are complex, encompassing multiple interrelated causes, overlapping social, economic, technological and regulatory dimensions, and exhibiting non-linear causal pathways (Ferraro, Etzion & Gehman 2015; George et al. 2016). Grand challenges present problems whose nature and solutions are not fully understood, resulting from evolving conditions, unpredictable interactions among actors, emergent risks and unknown unknowns (Gehman, Etzion & Ferraro 2022). Grand challenges involve competing values and contested definitions of success, which means that they require trade-offs and balancing public good with institutional interests (George et al. 2016). Grand challenges cannot be solved by a single actor or isolated institutional efforts, as they transcend institutional boundaries, geographies and policy domains (Ferraro et al. 2015). Lastly, grand challenges cannot be solved with short-term interventions (Mundy & Maddern 2025).

Given these characteristics, addressing grand challenges requires long-term, coordinated, multi-stakeholder collaboration rather than isolated institutional interventions. Resource duplication is a symptom of the complexity of grand challenges (De Clercq 2026).

Viewing CFE as a grand challenge suggests that it will be most effectively addressed through a systems thinking approach. Systems thinking provides the conceptual tools needed to understand dynamic interactions, coordinated multiactor responses and generate systemic solutions (Carayannis et al. 2021). In this sense, systems thinking becomes a foundational lens for understanding how collaborative resource development can emerge within a fragmented CFE landscape. As a multiactor responsibility, CFE requires a systemic approach in which knowledge, resources and content are shared across institutions to avoid duplication and increase reach. Given the complexity of multiactor responsibility, systems thinking will be examined through the 5HM as the foundation for coordination. Systems thinking and the 5HM are presented next, followed by the introduction of OER and open practices as mechanisms to operationalise the 3C development of CFE resources and interventions. These mechanisms form the basis for the OER-based collaboration.

Systems thinking and the Quintuple Helix Innovation Model

Systems thinking is 'a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviours and devising modifications to them to produce desired effects' (Arnold & Wade 2015:675). Systems are generally defined by their goals but also share commonalities such as collaboration, interconnections and interdependence. Applying an ecosystem lens to systems thinking implies that the system is seen as more than a set of parts acting together, but as a diverse group of participants in which resources are integrated, and value is co-produced through ongoing interactions. Ecosystems jointly create value in ways no single actor can (Bogers, Sims & West 2019). The interconnectedness of an ecosystem can be utilised to create communal benefit while accepting individual self-interests. De Clercq (2026) positions national CFE as an ecosystem and proposes a governance model based on the application of the 5HM. The 5HM refers to the participation of actors from government, academia, industry, civil society and the natural environment in the ecosystem (De Clercq 2026).

At the national level, De Clercq (2026) argues that a conceptual CFE ecosystem framework grounded in the 5HM offers a novel and necessary lens for reimaging CFE as a collaborative, adaptive and value-generating system. Systems thinking emphasises interconnections, feedback loops and shared value across an ecosystem. When systems thinking is applied to the context of CFE, it can explain why siloed, proprietary efforts might not be effective. De Clercq (2026:432) suggests that an ecosystem approach to CFE will alleviate the challenge of resource duplication; she proposes that this is accomplished through a 'dynamic, coordinating governance entity'.

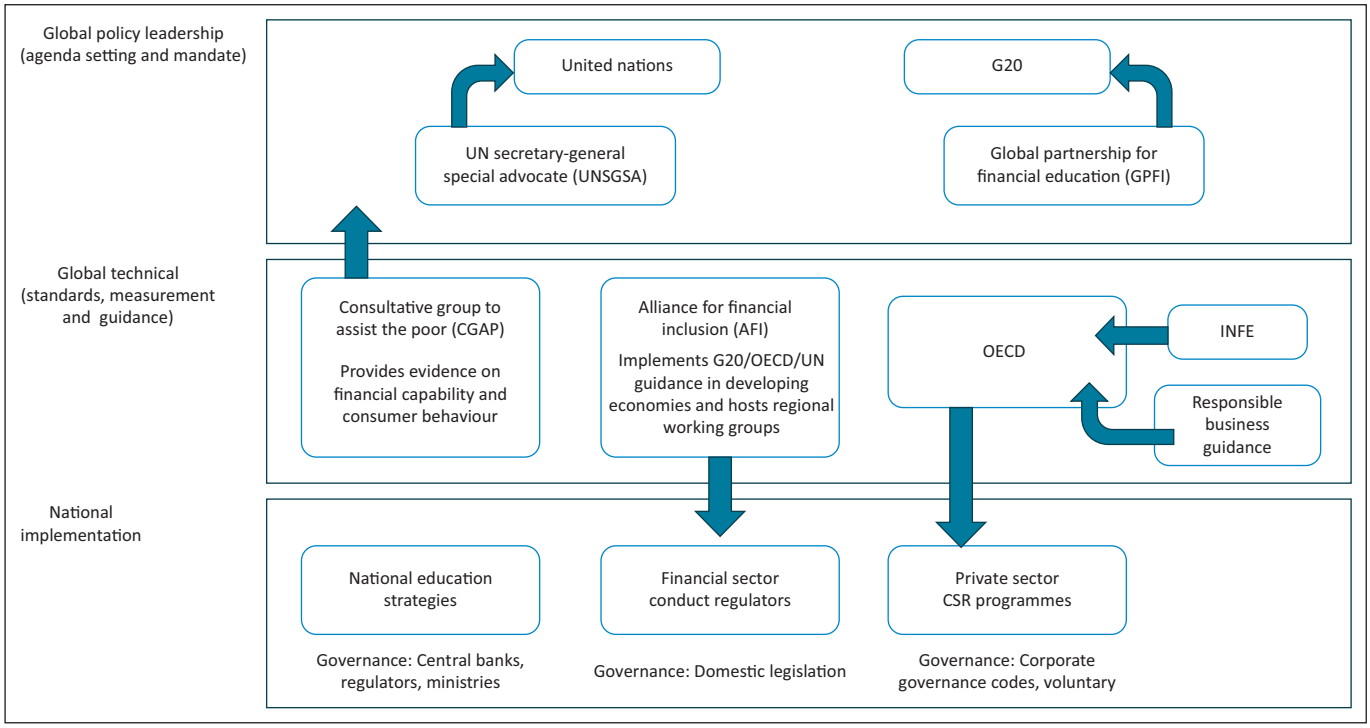
Building on ecosystem research (Bogers et al. 2019), Fedele et al. (2025) apply the concept of collaborative ecosystems to settings in which institutions mitigate risk by sharing resources. In collaborative ecosystems, the assumption is that this environment enables institutions to operate more efficiently in terms of costs, time and quality (Fedele et al. 2025). This assumption highlights that the efficiency of CFE provision depends not only on coordinated governance but also on collaboration through shared, reusable and

adaptable educational resources. Collaborative ecosystems are generally characterised by collaboration between 5HM actors.

Accepting a collaborative ecosystem approach, combined with systems thinking, a national CFE ecosystem can be viewed as a subsystem within the broader global policy environment, providing the context that shapes the development of national CFE initiatives. In system terms, global bodies form the macro-level architecture that sets the overarching purpose of financial well-being and inclusion, which is achieved through improved financial literacy. Global bodies establish the rules governing the system's consumer protection, and they influence the feedback loops that shape how national bodies regulate the design and delivery of financial institutions' educational initiatives. Both the global and national contexts are relevant and discussed briefly because understanding this multilevel architecture is important for illuminating the origins of national CFE mandates.

Global transnational policy architecture: Systems thinking helps illustrate how the global multiactors interact to create a shared vocabulary, aligned incentives and converging expectations. Global transnational frameworks are not binding but rather globally recognised standards and recommendations that influence how social, economic and sustainability policies can be aligned across countries and specific industries or sectors. Figure 1 maps this architecture as three tiers. At the apex, the United Nations (UN) and the Group of Twenty (G20) Global Partnership for Financial Inclusion (GPFI) set developmental mandates and policy direction. In the second tier, the OECD and its International Network on Financial Education (INFE) issue governance standards and coordination mechanisms supported by implementation bodies such as Consultative Group to Assist the Poor (CGAP) and Alliance for Financial Inclusion (AFI). At the third tier, national regulators translate these standards into conduct frameworks and national financial education strategies. Read from apex to base, the figure makes visible a consistent pattern of collaboration and coordinated action at every tier. However, the mechanisms by which institutions jointly develop or share educational materials are lacking. It is this absence that the 3C framework addresses.

At the apex of the CFE transnational policy architecture is the UN. The UN, through its 2030 Sustainable Development Goals (SDGs) and the United Nations Secretary-General's Special Advocate for Financial Health's (UNSGSA) financial well-being agenda, sets the desired global moral imperatives. The SDGs and the financial well-being agenda provide the overarching developmental mandate for inclusive finance, which is essential for empowerment, reducing inequality and promoting inclusive economic participation. Building on the UN's 2030 Agenda, the G20, through the GPFI, provides leadership by converting the UN mandate into policy direction. The GPFI principles encourage coordinated action, peer learning and shared approaches to consumer financial literacy. In the second tier, the OECD and its INFE (OECD/INFE) recommendations outline governance standards, stakeholder coordination mechanisms and frameworks for monitoring, evaluation and resource sharing. Supporting institutions such as the CGAP and the AFI translate high-level principles into implementation guidance. The United Nations Educational, Scientific and Cultural Organisation (UNESCO), while not a financial sector body and thus not



OECD, Organisation for Economic Co-operation and Development; INFE, International Network on Financial Education; CSR, corporate social responsibility; UN, United Nations.

FIGURE 1: Global financial education system map.

depicted in the figure, reinforces the ecosystem through its education and open-knowledge frameworks. At the third national level tier, regulators embed global standards into conduct frameworks and translate them into national financial education strategies. The 3C framework operates at the national level; therefore, a brief discussion of the national ecosystem is relevant.

National ecosystem and corporate social responsibility: Financial services regulation, consumer protection norms and corporate social responsibility (CSR) frameworks have become increasingly globalised through transnational standard-setting. While not all national jurisdictions mandate CFE for their financial services industry, most national regulations include CFE expectations in their conduct frameworks as a core mandate (FSCA 2024; OECD 2015). Conduct frameworks create an obligation or responsibility for financial institutions to invest in financial education initiatives, aligning with the broader principles of global CSR, which emphasise the social and ethical duties of institutions to contribute to societal well-being beyond compliance (Carroll 2025). However, these conduct frameworks have not translated into coordinated resource development, leading to multiple institutions independently producing similar CFE materials.

Corporate social responsibility strategies, interventions or programmes are the institutional mechanisms that operationalise policy principles into practice (Roszkowska-Menkes 2018). International CSR scholarship emphasises that firms increasingly operate within broader systems of societal responsibility (Wang et al. 2016). Carroll's (2025) updated Corporate Social Performance model highlights that modern CSR encompasses more than merely discretionary contributions. Consumer financial education sits squarely within this expanded CSR mandate. This expanded CSR positioning creates a conducive environment for shared value approaches, in which institutions jointly produce educational resources aligned with societal goals such as consumer protection, reducing inequality and strengthening economic participation, thereby contributing to the SDGs on inclusion, reduced inequality and sustainable partnerships. Sustainability is the synthesis of economic and social dimensions of development through collaborative ecosystems (Fedele et al. 2025).

Early OECD (2005) guidelines indicate that financial institutions should clearly distinguish education activities from commercial marketing and financial advice. The neutrality of CFE content is also protected through restrictions on the marketing and branding of specific products (De Clercq 2026). This restriction lays a solid foundation for the OER-based collaborative development of brand- and product-agnostic CFE resources and initiatives.

Many transnational frameworks further underscore the need for collaboration in the provision of CFE (Atkinson & Messy 2013; OECD 2015) to empower financial consumers and promote improved financial well-being by enhancing financial literacy. Yet these frameworks stop short of operationalising how collaboration should occur, particularly regarding the joint development, sharing and adaptation of educational content. This operational gap is where open practices and OER can provide practical, structured mechanisms for creating shared resources. Although scattered collaborations do occur, the collaborative governance structure of a CFE ecosystem requires 'localised engagement' (De Clercq 2026:432). De Clercq's (2026) conceptual framework of a collaborative governance regime addresses the drivers of the CFE ecosystem. Her work positions the 5HM actors as a collaborative ecosystem, while also incorporating the relevant regulations and the central body that will govern the coordinated process (De Clercq 2026). While governance is not a focus of this article, it serves as a basis for positioning the coordinated and collaborative development of CFE resources.

Coordination, cooperation and collaboration

Practitioners regard coordination, cooperation and collaboration as being the core of successful interorganisational relationships. The terms, however, are often used interchangeably in literature, although they reflect different levels of engagement among actors (Castañer & Oliveira 2020; Mundy & Maddern 2025). Coordination, cooperation and collaboration are connected by the goals of the engagement (Castañer & Oliveira 2020). These authors indicate, in the most recent systematic literature review on the definitions of coordination, cooperation and collaboration, that three interactional dimensions are present to varying degrees: (1) attitude, (2) behaviour and (3) outcome.

Coordination refers to the behavioural alignment of mandates, priorities and activities across diverse actors in pursuit of a common goal; it is defined in terms of behaviours and requires joint action (Castañer & Oliveira 2020). Cooperation builds on coordination and involves implementing the agreed goal. In many definitions, cooperation implies a willingness to engage; it is thus a behaviour and an attitude (Kumar & Das 2007; Zeng & Chen 2003). Based on their literature review, Castañer and Oliveira (2020) confirm that collaboration is not merely the sum of coordination and cooperation; it involves helping other partners achieve a common goal by taking on agreed-upon tasks to advance it. Collaboration is characterised by the absence of free-riding; that is, actors refrain from pursuing private goals at the expense of collective ones (Kretschmer & Vanneste 2017).

Despite the acknowledgement that collaboration is required to address complex social problems, researchers and practitioners point out that collaboration, especially inter-institutional collaboration, is challenging and difficult to manage (Seo & Bryson 2022). Co-creating shared OER-based CFE resources in the financial services industry requires inter-institutional collaboration. Inter-institutional collaboration involves coordination and cooperation between institutions (Castañer & Oliveira 2020). Piantoni and Arena (2025) suggest that organisations can effectively

integrate CSR into ecosystems comprising diverse, interdependent actors. Although not in the financial services sector, their article demonstrates that ecosystem-level sustainability requires moving from traditional internal strategies to collaborative co-creation approaches (Piantoni & Arena 2025), further strengthening the collaborative positioning. Co-creation refers to the process of integrating resources that occurs when actors engage in collaborative practices (Frow, McColl-Kennedy & Payne 2016). Collaboration, defined as 'working together with others to achieve a common goal', can be both a process and an outcome (Mundy & Maddern 2025:1). It is based on the idea that interactions between actors working together towards a common goal and sharing resources can solve complex problems that would not be possible in their individual capacities (Mundy & Maddern 2025).

Literature on collaboration frameworks generally addresses the initiation of collaborative partnerships, their dynamics, governance and the characteristics that lead to successful collaborations (Mandell & Keast 2007). As the focus of this study was on identifying the conceptual foundations that inform the collaborative component of the proposed 3C framework, the conditions of collaboration were deemed met through the nationally coordinated body and are considered an important assumption for the sustainability of producing CFE resources.

In research on an ecosystem for corporate training, Sanchez-Gordon and Luján-Mora (2015) propose a framework with a lifecycle in three stages: (1) develop, (2) publish and (3) improve. Their research illustrates how businesses can leverage OER to create cost-effective, flexible learning environments that align with corporate goals. Although developed for corporate training, the lifecycle illustrates how coordinated and cooperative collaboration and OER can support iterative content development. Collaborative resource development within the CFE ecosystem is active and iterative, moving through phases of creation or adaptation, distribution, evaluation and refinement. These three stages mirror well-established collaborative lifecycle models that emphasise co-creation, shared authorship and continuous improvements across institutions (Aunger, Millar & Greenhalgh 2023; Guertler et al. 2022).

The 3C framework builds on Sanchez-Gordon and Luján-Mora's (2015) development phase in which the resource is aligned with corporate goals and culture; in the CFE context, that alignment extends to national CFE goals. In a collaborative context, this developmental phase also requires integrating diverse institutional inputs, aligning shared goals and jointly determining the scope and structure of the educational resource. A core conceptual hurdle in the financial services sector is the duplication of efforts, coupled with resource constraints. As part of the development process, collaborators should use OER to create a shared pool of quality, brand-agnostic content that allows institutions to reuse existing resources and remix them for their different needs. This open practice of sharing resources aligns with the 3C aims on which the 3C framework is built.

Ng'ambi and Luo (2013) propose an inter-institutional collaborative framework for OER, demonstrating that shared licensing and joint development can operate across organisational boundaries. Their framework is situated in higher education where collaboration is discretionary. In a regulated CFE ecosystem, collaboration is mandated but unimplemented, and it is this gap between obligation and mechanism that the 3C framework addresses. Collectively, collaboration frameworks provide valuable insights, but none fully integrate collaboration theory with OER-enabled content development within a regulated CFE ecosystem, leaving a conceptual and practical gap. Given the need for mechanisms that can operationalise collaboration within the CFE ecosystem, open practices and OER offer a promising foundation.

Open practices and open educational resources

Openness takes multiple forms, including open access to research, open data and open education. Within this landscape, open education is guided by the principle that educational resources should be accessible, adaptable, improvable and redistributable without unnecessary restrictions (Cape Town Open Education Declaration 2010). Open practices refer to behaviours, values and a willingness to share and collaborate (Cronin et al. 2023), while OER refers to openly licensed teaching and learning materials that enable collaboration. Conceptually, open practice creates collaborative intention, and OER provide the mechanism through which collaboration can be operationalised (Cronin et al. 2023; Farrell et al. 2022).

Open licensing is fundamental to OER (Butcher & Moore 2015). Creative Commons licences provide the legal framework that enables the free sharing, adaptation and distribution of educational materials beyond but not negating traditional copyright permissions (Butcher & Moore 2015). The flexibility afforded by open licences enables continuous improvement, context-sensitive adaptation and multilingual or cultural localisation, all of which are important in diverse CFE environments. Because OER can be adapted – described in the OER literature as remixing, repurposing and reusing – they support differentiated learning needs, frequent content updates and responsiveness to changing technologies and financial products (Kimmons & Irvine 2023).

Several benefits of OER are especially relevant to the CFE ecosystem. Open Educational Resources can reduce duplication of effort by enabling institutions to draw from shared, high-quality, brand-agnostic resources. As they are openly licensed, the resources are adaptable and can thus be branded. Open Educational Resources also lower total development costs, support scalable distribution, improve accessibility and enhance the current state of materials through easier updating cycles (Baas & Schuwer 2020; Bliss, Tonks & Patrick 2019). Given that some CFE content could

require frequent revision because of evolving products and advances in technology, OER provide a sustainable approach. Although open practices and OER have traditionally been adopted in formal education contexts, there is increasing interest among organisations outside formal education in exploring the value of openness (Bliss et al. 2019; Farrell & Granly 2024). Despite the interest, uptake remains limited in informal educational contexts such as CFE, even with the growing evidence that openness can stimulate collaboration, improve quality and expand access (Farrell et al. 2022).

Several factors or barriers explain the limited adoption. Awareness of OER remains low, particularly in corporate environments (Farrell & Granly 2024). In some corporate settings, openly sharing content is perceived as conflicting with competitive advantage or a proprietary culture, leading organisations to distrust releasing content under open licences (Farrell et al. 2022). Balancing openness with institutional knowledge remains a challenge. Furthermore, many organisations lack clarity on sustainable models for investing in and maintaining openly licensed content (Tlili et al. 2020).

Of the four commonly cited categories of OER business models, namely, externally funded, internally funded, community and higher education service models (Encore+ 2022), the community model is most relevant to CFE. In this model, a community or network collaboratively creates, uses and shares OER on the premise that members freely exchange resources. However, it requires trust, leadership, shared standards and clear governance to function effectively (Tlili et al. 2020), characteristics that align with the multiactor CFE ecosystem but currently remain underdeveloped.

Despite the recognised benefits of OER and open practices, there is no existing conceptual or operational model that explains how openness can be leveraged to support 3C resource development in CFE. It is therefore proposed that an OER-based, 3C framework be designed to operationalise open practices within the CFE ecosystem, reduce duplication and enhance shared value resource development.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of South Africa, College of Accounting Sciences, Research Ethics Review Committee (No. 2006).

Results

As established, the CFE ecosystem faces the grand challenge of systemic inefficiencies that lead to the duplication and fragmentation of CFE initiatives and resources. These challenges require multiactor collaboration and cannot be addressed by isolated or single-institutional interventions (Ferraro et al. 2015; George et al. 2016). Within such an environment, the potential of openness, encompassing OER, is conceptually promising. Even though openness alone does not necessarily lead to collaboration, it is argued that OER create the possibility for collaboration. There is no existing collaboration or OER framework that addresses the regulated, inter-institutional CFE ecosystem. The CFE ecosystem requires mechanisms that support knowledge sharing and joint value creation. This section introduces the OER-based 3C financial education framework (hereafter, the 3C framework) to conceptually operationalise openness within the CFE ecosystem. The 3C framework builds on systems thinking and on the ecosystem perspectives that emphasise interdependence and shared value (Borges et al. 2022). This section outlines the 3C framework's positioning and then presents three high-level phases through which it supports joint value creation.

An overview and assumptions of the coordinated, cooperative and collaborative framework

Operating within the national CFE ecosystem, the 3C framework addresses two challenges identified in the literature: systemic inefficiencies that lead to fragmentation and duplication, and a lack of a mechanism to translate policy into practice. In addressing these challenges, the framework rests on four assumptions:

- The CFE ecosystem is characterised by a national committee or coordinating body.
- CFE actors have overlapping mandates and shared societal goals.
- The educational content currently produced by regulated financial institutions, although branded, is product-neutral.
- Collaboration is voluntary and cooperative, being both highly desirable for systemic efficiency, institutional compliance and mandate alignment and mutually beneficial through reduced institutional costs.

On these assumptions, open licences can be applied to both existing and newly developed content, providing the legal mechanism for reuse, remix and redistribution, while open practices foster the behavioural culture of sharing, transparency and trust that sustains voluntary collaboration. The 3C framework is underpinned by the 5HM, which is reflected in the national committee or coordinating body composed of government regulators, financial institutions, academia, civil society and community-based organisations.

The 3C framework is based on three engagement levels: coordination, cooperation and collaboration. It is coordinated through central oversight of mapping the landscape, aligning goals, avoiding duplication and guiding the process towards a common goal. It is cooperative because institutions or actors contribute resources, knowledge and expertise to implement the common goal. Institutions also share previously developed educational resources. Finally, the 3C framework is collaborative because actors co-create resources and share openly licensed outputs (OER). The framework is operationalised through each layer building on the preceding one. Open Educational Resources are the mechanisms that allow sharing, and open practices are the enabler.

Drawing on collaborative life cycle models (Aunger et al. 2023) and best practices for collaborative content development (Bliss et al. 2019; Mandell & Keast 2007), the 3C framework is structured around three distinct but iterative phases, while incorporating open practices: (1) foundational alignment, (2) collaborative resource development and (3) sustainability and continuous improvement.

Phase 1: Foundational alignment

This phase lays the groundwork and establishes alignment across the ecosystem. During this phase, existing CFE initiatives are mapped, content gaps and duplications are identified, and institutional mandates and their relationship to national priorities are examined (Sibanda & Sibanda 2016). A central governing body, such as a national financial education committee (De Clercq 2026), anchors this phase by bringing actors together, articulating objectives and enabling purposeful alignment. The outcome is clarity and coherence, which allows the ecosystem to move beyond fragmented decision-making. This creates the structural conditions for cooperation and collaboration.

Phase 2: Collaborative resource development

This phase represents the conceptual core of the 3C framework, where coordination evolves through cooperation into collaboration and co-creation. Well-established models of collaboration emphasise cycles of joint planning, shared authorship and continuous refinement (Aunger et al. 2023; Guertler et al. 2022). Collaboration during this phase is iterative. Trust and shared intent underpin the collaborative co-creation, through which openness and OER enable joint resource development. Open Educational Resources through open licensing allow actors to build on existing material, adapt it to diverse contexts and co-create new resources that remain accessible and legally reusable across the ecosystem (Baas & Schuwer 2020).

When co-creation both uses and produces OER, it adopts functional mechanics inherent to OER. In this context, co-creation is based on the following open practice principles:

- Workflows within the development process are disaggregated. Open Educational Resources allow actors to divide and conquer by enabling collaborators to adopt parts of the development process that match their strengths.
- Content is created as granular modules, and a 'puzzle piece' approach is applied, where collaborators find resources that fit their institutional goals and reuse, revise or remix them into the context of the educational resource under development (Ng'ambi & Luo 2013).
- Co-creation is based on reciprocity. If one actor improves a shared resource, all participants benefit from the enhanced version.

The central goal of this phase is to support the co-creation of openly licensed, reusable CFE resources through shared processes, collective decision-making and joint content development. Flowing from the principles of open practices, actors are guided to transparently conceptualise and create resources with shared quality standards, with the intention that the materials will be used, reused, remixed, repurposed and redistributed by others. Open practices entail actors starting the process by locating existing OER for potential adaptation or, where none exists, jointly designing new material.

Although the 3C framework is presented conceptually, it is acknowledged that collaborative co-creation typically involves shared resources and workspaces, collective review processes and iterative refinement. This article does not present technical workflows but emphasises joint authorship, collective quality assurance through planning, sharing and reviewing, and the embedding of open practices throughout the creation process.

Phase 3: Sustainability and continuous improvement

This phase of the 3C framework ensures long-term viability. Sustaining openness requires ongoing commitment. Continuity in this phase is underpinned by mechanisms that promote shared long-term stewardship of OER repositories, collective responsibility for updating and improving content, and feedback loops that incorporate insights from regulators, educators and users. The central body or national committee (collaborative governance) will need to encourage and cultivate norms of openness that transform once-off collaborations into an ecosystem characterised by shared values, mutual trust and continuous refinement and improvement, and where new resources are added to respond to financial trends and technological developments. This transformation will improve the ecosystem's capacity to respond and prevent the re-emergence of siloed approaches, thereby avoiding material duplication. Continuous improvement is thus conceptualised as a form of systemic (ecosystem) learning, in which actors update shared materials in response to changes in financial products, regulatory developments or societal needs. This reinforces openness as a long-term sustainable practice rather than a once-off intervention.

Discussion

The OER-based 3C framework provides a conceptual pathway for CFE ecosystems to transition from siloed, fragmented and duplicated activity to coherent, collaborative resource development. The 3C framework conceptualises the shift from individual social behaviour to a social practice in which knowledge sharing becomes a norm. The framework is underpinned by coordination, which establishes alignment of common goals and priorities, and cooperation, which builds shared purpose and aligns directly with open practices. Through shifting the coordination of common goals to cooperation and ultimately collaboration, openly licensed high-quality resources will be developed. These resources can be repurposed and reused across institutional boundaries.

The framework's contribution lies in specifying a mechanism where the literature has offered a diagnosis, lifecycle or preconditions. Where De Clercq (2026) maps a fragmented CFE ecosystem, Sanchez-Gordon and Luján-Mora (2015) model an intra-organisational OER lifecycle, and Tlili et al. (2020) name the governance conditions on which community OER depends, the 3C framework sequences coordination, cooperation and collaboration so that those conditions are produced rather than presumed. Openness thereby shifts from being an attribute of resources to an instrument of ecosystem coordination.

The framework advanced in this article is conceptual and three limitations bound its claims. Firstly, its assumptions, namely the presence of a national coordinating body, overlapping institutional mandates, the product neutrality of existing content and the voluntary nature of collaboration, are grounded in the literature but remain empirically untested. Future research should therefore examine how the 3C framework operates within a specific national CFE ecosystem, identifying the governance, behavioural and contextual conditions that enable or impede OER-based collaboration, and evaluating whether collaboratively developed resources measurably reduce duplication and strengthen CFE outcomes over time. Secondly, the literature synthesis is purposive rather than exhaustive. Adjacent fields such as knowledge management, platform economics and commons governance could be integrated to refine the framework's mechanisms in further iterations. Thirdly, South Africa serves as an illustrative context rather than a unit of analysis, and the framework's transferability therefore remains an open question. Comparative studies across national ecosystems and across regulated sectors facing similar coordination mandates would establish the conditions under which the 3C framework logic holds.

Conclusion

By integrating open practices and OER with systems thinking and ecosystem theory, the 3C framework offers a novel conceptual approach to reducing duplication, enhancing quality and promoting adaptable, sustainable CFE provisions. It offers a theoretically grounded response to the grand challenge of improving financial literacy through shared value OER.

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Competing interests

The author, Kerry L. de Hart, declares that she has no financial or personal relationships that may have inappropriately influenced her in writing this article.

CRediT authorship contribution

Kerry L. de Hart: Conceptualisation, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Validation, Visualisation, Writing – original draft, Writing – review & editing. The author confirms that this work is entirely her own, has reviewed the article, approved the final version for submission and publication, and takes full responsibility for the integrity of its findings.

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