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Analysis of Organizational Barriers to Collaborative Teaching of Information Literacy in Libraries in Chinese Higher Education Institutions (HEIs)

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Abstract: Practice has proved that the information literacy collaborative teaching model has good teaching results. Mature experience has been accumulated abroad, while relevant practices in China have not been popularized. Existing research mainly focuses on teaching models but lacks the analysis of deeply influencing factors. This study aims to explore the key organizational elements that hinder the collaborative teaching of information literacy in the libraries of higher education institutions in China through interviews. The research finds that the core obstacles include the following three aspects: (1) structural inertia, systematic lack of top-level design and resource guarantee; (2) cognitive inertia, deep-rooted professional bias; and (3) political inertia, inversion of incentive mechanisms. The obstacles to collaborative teaching are deeply rooted in the fabric of the organizational system, and behind them is the conflict of institutional logic. Solving the dilemma requires intervention from four aspects: formulating top-level design, unifying cognition and identity, pilot practice, and technology empowerment, aiming to provide theoretical and practical enlightenment for relevant research. Viewed from the perspective of artificial intelligence (AI) applications in education, these findings explain why the institutionalization of AI-related information literacy teaching depends not only on digital tools but also on organizational conditions that support curriculum integration, cross-departmental coordination, and responsible pedagogical use.

Keywords: information literacy, information literacy collaboration, collaborative teaching, organizational barriers

1. Introduction

After decades of development, the importance of collaborative teaching of information literacy has become a consensus. Many countries have explored various levels of collaboration, including collaboration within universities, such as library–faculty collaboration and library–university stakeholder collaboration. There is also external collaboration involving local, regional, national, and international collaboration, such as interlibrary collaboration, collaboration between libraries and enterprises, and scientific research institutions [1]. Among these collaboration models, the librarian–faculty collaboration model proved to be the most effective [2]. By incorporating information literacy into subject curriculum, it can not only help students better understand and master subject knowledge objectives but also enhance students' learning ability by finding and evaluating information [3]. Although the world advocates collaboration in information literacy teaching, after more than 20 years of exploration and practice, the number of libraries integrating information literacy with professional courses in Chinese higher education institutions (HEIs) is still small, and some studies show that only 20.7% of the total 570 HEIs surveyed [4]. This practice has not been fully recognized and popularized by HEIs [5].

Some scholars have explored the factors of poor information literacy collaborative education in Chinese HEIs, such as awareness, personnel, and teaching mode, but there is a lack of research from the perspective of institutional barriers of organizations. Therefore, this study aims to fill this gap and explore the institutional obstacles faced by libraries of HEIs in our country to carry out information literacy collaborative teaching. Based on in-depth interviews with librarians in HEIs, we reveal the institutional logic that causes organizational inertia, rather than just superficial explanations such as "lack of awareness." These findings provide a new, evidence-based framework for understanding these barriers and informing relevant research.

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In the context of rapid artificial intelligence (AI) adoption in higher education, the significance of this topic extends beyond general library collaboration. Information literacy in universities is increasingly expanding toward AI literacy, including the critical evaluation of AI-generated content, the responsible use of generative tools, and the ethical and critical understanding of algorithmic systems [5–7]. Under this condition, collaborative teaching between librarians and faculty becomes an important application mechanism for embedding AI-related competencies into disciplinary curricula. The present study therefore speaks to AI applications in education by examining the organizational conditions under which AI-relevant information literacy teaching can or cannot be institutionalized in Chinese HEIs.

This paper is informed by three research questions. To begin with, what are the organizational obstacles between libraries in Chinese HEIs and the faculty in information literacy teaching? Second, how do these obstacles occur as structural inertia, cognitive inertia, and political inertia in the everyday practices of libraries and academic departments? Third, in what way are these inertial mechanisms created and sustained by the competition between administrative logic, professional logic, and educational logic? This research adds a holistic answer to these questions by interviewing librarians at institutions with various institutional types to relate the failure aspects of collaboration to the underlying conditions affecting the institutions, and the paper offers a practical foundation to policymakers in developing institutional interventions capable of transforming the practice of collaboration in an institution not to be periodic but sustainable in teaching.

The remainder of this paper is organized as follows. The literature review clarifies the limitations of existing explanations and motivates a mechanism-based approach. The theoretical framework introduces the integrated concepts and formalizes the diagnostic method. The research methodology section specifies the case design, data collection, and analytic procedures. The findings present both descriptive themes and the diagnostic outputs of the proposed method. The discussion translates these outputs into institutional interventions and outlines the theoretical and practical implications.

2. Related Work

2.1. The evolution of the concept of information literacy

Since the concept of information literacy was proposed in 1974, it has been revised many times and then redefined, and its connotation and extension have been continuously enriched and developed. So far, its scope has expanded to digital literacy and even AI literacy. Information literacy is no longer a standardized set of skills, nor is it a combination of abilities that vary depending on the situation, but a comprehensive and integrated ability [6]. It requires students to successfully participate in collaborative communities as information consumers and creators, including reflective discovery of information, understanding how information is generated and evaluated, using information to create new knowledge, and ethically participating in learning communities [7]. In the current era of rapid development of AI technology, the connotation of information literacy is destined to expand further to address new challenges such as algorithmic literacy and critical AI applications, thereby ensuring that it remains relevant in the rapidly evolving digital landscape.

2.2. Definition of collaborative teaching

In the context of university librarian–faculty collaboration, co-teaching refers to "an educational innovation process involving academics, librarians, and other interested parties working together to share knowledge and expertise to support the enhancement of teaching, learning, and research experiences in the university community" [8]. Montiel-Overall (2005) further defines collaborative teaching as "an integrated teaching relationship involving two or more equal participants thinking together, planning together, and co-creating innovation" [9]. This definition emphasizes equal participation and co-creation in collaborative teaching. It is described as "a process of joint work, learning, and sharing, with a particular focus on teaching, learning, and research activities among educational participants, in which knowledge can be activated and transferred" [10]. Although several scholars have different descriptions of collaborative teaching, they all involve the collaboration of multiple participants.

2.3. Research status

2.3.1. Status of international research

There is a clear consensus in the global education community that collaborative teaching can significantly improve students' academic performance by integrating the professional strengths of professional teachers and librarians [11], strengthening critical thinking skills [12], and fostering sustainable lifelong learning [13]. This interprofessional collaboration model has been recognized as the gold standard for information literacy education by UNESCO's Global Media and Information Literacy Assessment Framework [14], and its effectiveness has been validated in more than 200 empirical studies across six continents [15] and has become a core strategy for addressing the challenges of education in the era of information explosion. Paramansyah compared the effects of the "five-time lesson model" with the traditional "one-shot" model in his research and found that the former significantly improved students' information literacy [16].

Many developed countries have accumulated rich and mature experience in collaborative teaching of information literacy. An analysis of the literature found that research in recent years has focused on the following two aspects: First, continued collaboration between teachers and librarians to embed information literacy into subject courses to improve teaching effectiveness. The second is a standard update. The "Information Literacy Framework for Higher Education" released by the American Association of College and Research Libraries in 2015 is still influential [7], but in recent years, it has paid more attention to the research on "elementary literacy" and emphasized dynamic learning capabilities [10]. In 2022, the European Union launched the "Citizen Digital Competency Framework" (DigComp 2.2) to integrate data privacy and cybersecurity education [17]. The third is AI literacy education. AI literacy has become a new focus in information literacy research. Researchers from Germany, the United Kingdom, and the United States have jointly developed testing tools covering AI concepts, ethics, and technology applications. The research recommends integrating AI literacy into interdisciplinary course design. Fourth, continue to advocate for global collaboration. International organizations represented by UNESCO are committed to promoting multi-party collaboration and jointly promoting the development of collaborative teaching of information literacy.

Nonetheless, collaboration faces many obstacles, most notably institutional barriers. In many HEIs, academic departments and libraries belong to different management systems, making resource allocation, performance evaluation, and work processes difficult to coordinate [10]. For example, teachers' promotions are based on scientific research results, while participation in information literacy teaching is often not regarded as an important contribution; librarians' assessments focus on service indicators and lack an incentive mechanism for teaching collaboration. Additionally, time and resource constraints are familiar challenges. Teachers face heavy teaching and scientific research pressure, while librarians need to deal with daily reference consultation and resource construction. It is difficult for both parties to devote enough time to course design and collaborative teaching. The fragmentation of technology platforms has further exacerbated this problem. Many schools' library systems lack deep integration with course management systems, making teaching resource sharing and collaborative assessment complex and inefficient.

2.4. Research status in China

China attaches significant importance to information literacy education and has issued several support policies. For example, in 2015, the Ministry of Education of China issued the "Regulations for Libraries in Ordinary Colleges and Universities," which clearly requires libraries to participate in information literacy education [18]. In 2021, the Ministry of Education and the Ministry of Industry and Information Technology jointly promulgated the "Action Plan for Improving Digital Literacy and Skills for All," with the goal of initially building a national digital literacy education system by 2025 [17]. Many researchers have paid attention to the necessity of collaborative teaching and introduced advanced foreign teaching models and case experiences, which have promoted the development of collaborative teaching of information literacy.

Current research focuses on the following three aspects: First, focus on embedded teaching, try to embed information literacy education into professional courses, and collaborate with librarians and department teachers to design teaching content to improve subject pertinence [19]. The second is cross-agency collaboration and resource sharing. Some regions have tried to establish a platform for the co-construction and sharing of information literacy education resources, and some HEIs have cooperated with database providers to carry out database use training. The third is technology-enabled educational innovation. On the one hand, it is reflected in the application of blended learning modes, such as Massive Open Online Courses (MOOCs) and micro-courses. On the other hand, focusing on improving AI literacy, some HEIs offer AI literacy courses and AI ethics courses to explore algorithmic bias and privacy protection.

The importance of collaborative teaching of information literacy in higher education has been widely recognized [7], but the practice of HEIs in China still faces significant difficulties and challenges. It is reflected in the following aspects: First, the emphasis is on "operation" and light on "system." Current research focuses on "how to cooperate" (e.g., instructional design, curriculum arrangement), but less on "why collaboration is difficult to promote." Second, obstacle analysis is superficial. The analysis of collaboration barriers in existing studies mostly stays at "insufficient collaboration awareness," "poor communication," "lack of subject knowledge by librarians," etc., and does not touch on deeper organizational and management issues. Third, there is a single perspective: only focusing on libraries and ignoring multiple subjects. Existing research mostly starts from the perspective of libraries, ignoring the academic affairs department, faculty teachers, and student groups.

The above analysis shows that there are three challenges facing collaborative teaching of information literacy in China. However, existing research clearly paints a picture of "what" hinders collaboration but lacks a strong theoretical explanation for "why" these barriers are so stubborn and pervasive. Therefore, this study aims to fill this key gap by introducing an integrated theoretical framework of "organizational inertia" and "institutional logic" and systematically analyzing the deep factors of the dilemma of collaborative teaching of information literacy in the context of libraries in Chinese HEIs, so as to provide a new analytical perspective and theoretical contribution for understanding and solving this practical problem.

Existing studies have offered valuable pedagogical models and practical experiences for collaboration, including typologies that describe a progression from coordination to deeper forms of co-teaching partnership [9]. Many information literacy frameworks also emphasize curriculum integration, embedded teaching, and outcome alignment as practical routes to collaboration [11, 20]. These approaches are important for describing forms of cooperation and instructional arrangement, but they usually remain at the levels of pedagogy and implementation and therefore provide limited explanation of why collaboration repeatedly stalls when policy legitimacy is weak, role boundaries are defended, and incentives are misaligned in organizational practice. In addition, the institutional logics perspective offers a strong explanation of how organizational actors justify action and defend authority, yet it is more often used as an interpretive lens than as an operational diagnostic procedure [21]. To address these limitations, this study introduces inertia logic diagnostic method (ILDM) as a mechanism-based diagnostic approach that combines barrier classification, logic mapping, and mechanism synthesis in order to explain not only what barriers exist but also how they are reproduced and where institutional intervention should begin [21–23].

3. Contribution

This study makes three contributions to the research on information literacy collaborative teaching in Chinese HEIs. First, it proposes an ILDM that transforms qualitative interview evidence into a mechanism-based explanation of why collaboration is difficult to institutionalize by integrating organizational inertia with the institutional logics perspective [21–23]. Unlike collaboration typologies that primarily describe relationship depth and unlike barrier lists that summarize recurring problems, ILDM identifies how barriers are connected through reinforcement relations and how they are legitimized by competing institutional logics [9, 24]. Second, the method is evaluated through a multiple case qualitative design across different institutional types, which supports analytic generalization about barrier mechanisms rather than statistical inference [24]. Third, the study shows that diagnostic mapping can generate intervention levers that are more actionable for institutional design and governance because the same qualitative evidence is translated into both explanation and institutional response points [23].

Rather than offering another descriptive inventory of collaboration problems, this study contributes a mechanism-based explanation of why these problems persist across institutional settings. Using a multiple case qualitative design, the analysis

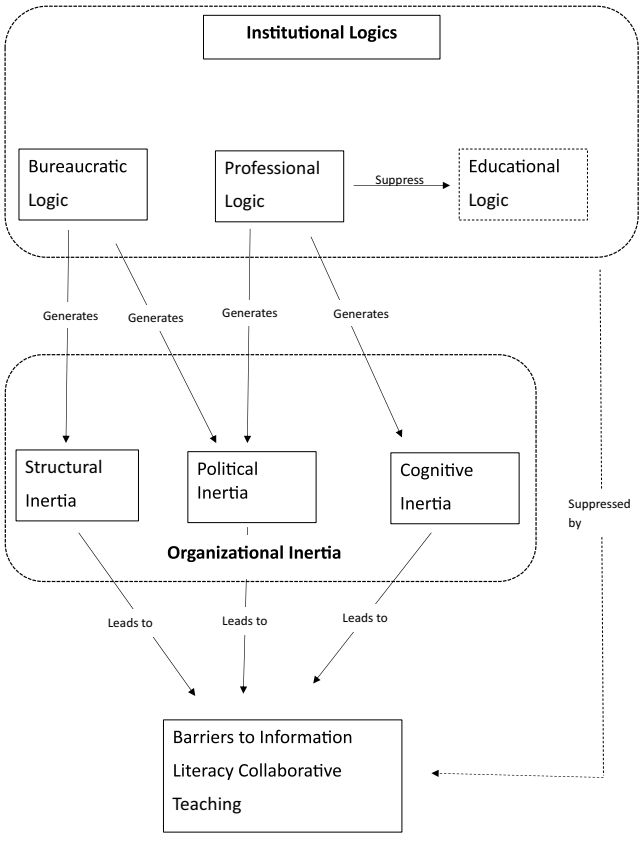
combines thematic coding with ILDM to trace how policy absence, role boundary defense, and incentive inversion reinforce one another in daily organizational practice [23, 25]. The contribution of the study therefore lies in moving from a barrier list to an explanation of barrier reproduction and in linking that explanation to institutional levers that are relevant for intervention.

3.1. Theoretical framework

To deeply analyze the deep-seated obstacles to the difficulty of collaborative teaching of information literacy in libraries in Chinese HEIs, this study takes "Organizational Inertia" as the core analysis concept and introduces the theory of "Institutional Logics" to reveal the deep motivation of inertia. The combination of the two constitutes the theoretical framework of this study (Figure 1), which aims to systematically answer the two core questions of "why is collaboration so difficult" and "where does resistance come from." Figure 1 presents the integrated theoretical framework used in this study. As shown in Figure 1, structural inertia, cognitive inertia, and political inertia appear as the immediate manifestations of collaboration barriers, while administrative logic, professional logic, and educational logic explain the institutional conditions that sustain or constrain these barriers. The figure summarizes the analytical path from observable organizational problems to mechanism explanation.

Organizational inertia stems from organizational ecology theory, which refers to the phenomenon in which organizations tend to maintain existing structures and habits in the face of change [26]. This concept involves the negative attitude of "unwillingness to change." Organizational inertia is composed of three factors, including structural inertia, cognitive inertia, and political inertia. Structural inertia refers to the rigid rules, standardized processes, and departmental barriers of the hierarchical system, which make cross-departmental collaboration difficult [27]. Cognitive inertia refers to the long-term formation of inherent concepts that limit the exploration of innovative collaboration models [28]. Political inertia refers to the possibility that change may be resisted by personal stakeholder groups to maintain existing power structures [29]. Therefore, the dilemma of collaborative teaching of information literacy in libraries in Chinese HEIs can be regarded as a typical manifestation of organizational inertia. For example, the collaboration between teachers and librarians is often stagnant due to assessment systems (structural inertia), subject-led thinking (cognitive inertia), and competition in resource allocation (political inertia).

Figure 1
Integrated theoretical framework of organizational inertia and institutional logics for diagnosing barriers to information literacy collaborative teaching in Chinese HEIs



3.2. Proposed inertia logic diagnostic method

The deep attribution of organizational inertia comes from the theory of institutional logic, which believes that organizational behavior is governed by multiple socially constructed belief systems, and different logics compete for dominance in the same field [21]. The following key logics exist in China's HEIs: first, administrative logic, which mainly emphasizes order, operates according to established rules, and focuses on stability, such as the academic affairs department may pay more attention to the standardization of teaching evaluation than the innovation of cross-departmental collaboration. The second is professional logic, with subject autonomy as the core; teachers tend to maintain the teaching sovereignty of their majors and have reservations about the "cross-border" participation of librarians. The third is educational logic, which takes student development as the goal and should theoretically promote collaboration between teachers and librarians, but it is often suppressed by the first two logics [30]. The dilemma of collaborative teaching can be interpreted as the dual barriers of administrative logic (risk avoidance) and professional logic (subject barriers), resulting in the marginalization of educational logic. Libraries are not purely administrative institutions and lack the right to discourse disciplines, making it difficult to promote collaborative teaching of information literacy.

In summary, the competition and conflict of institutional logic are the deep-seated factors that generate and maintain organizational inertia. To maintain their respective authority, administrative logic and professional logic jointly strengthen structural and political inertia, for example, to jointly resist collaboration that may blur the boundaries of departments. The formation of cognitive inertia comes from the long-term dominance of administrative logic and professional logic, making "one more thing is better than one less" a shared mentality of the organization. The educational logic representing the needs of collaboration cannot effectively break through the suppression of the first two logics because it is difficult to provide strong incentives and returns under the current system. Therefore, the difficulty of collaborative teaching of information literacy is not only a resource or technical problem, but its essence is to promote the power of collaboration (educational logic) and to shake the strong organizational inertia aimed at maintaining the status quo (administrative logic and professional logic alliance).

To move from conceptual discussion to a technical analytic procedure, this study operationalizes the integrated framework as an ILDM. The method treats reported collaboration barriers

as observable symptoms and then traces how these symptoms are stabilized by inertial structures and legitimized by dominant institutional logics [21, 22]. In line with mechanism-based explanation in the social sciences, the purpose is not only to state that barriers exist but also to specify the generative processes through which barriers persist and reinforce one another in routine organizational practice [23].

ILDM consists of three linked analytic steps. First, barrier statements are classified into structural inertia, cognitive inertia, and political inertia according to whether the constraint is primarily embedded in formal rules and resource allocation, shared perceptions and professional identities, or incentive and authority arrangements that affect participation [22]. Second, each barrier is mapped to the institutional logic that most strongly legitimizes it in context, administrative logic, professional logic, or educational logic [21]. Third, the mapped barriers are synthesized into mechanism statements that specify reinforcement relations, for example, how policy absence creates a legitimacy deficit, legitimacy deficit strengthens boundary defense of teaching sovereignty, and boundary defense contributes to incentive inversion that discourages sustained participation.

In addition to narrative mechanism statements, ILDM uses a barrier mechanism matrix to display how inertia dimensions and institutional logics co-occur across cases and across stages of collaboration practice. Matrix displays are widely used in qualitative analysis to support cross-case comparison and transparent explanation building, especially when the goal is to move from description to explanation [31]. In this study, the matrix is used not as a simple summary device but as a diagnostic tool that makes visible how different forms of inertia are sustained by competing institutional logics and how these relations recur across institutional settings [21–23].

Compared with existing approaches, the novelty of ILDM lies in its integration of descriptive and explanatory functions. In information literacy research, collaboration typologies, curriculum integration models, and descriptive barrier summaries are valuable for identifying teaching arrangements, partnership depth, and recurring difficulties, but they usually treat barriers as parallel issues and therefore provide limited guidance on why collaboration remains difficult to institutionalize [9, 11, 20, 24]. In institutional theory, the institutional logics perspective offers a strong explanation of how actors justify decisions and defend authority, yet it is usually applied as an interpretive perspective rather than as a procedural method for diagnosing organizational barriers [21]. ILDM combines these traditions into an operational procedure that classifies barrier evidence by inertia dimension, maps each barrier to the logic that stabilizes it, and then synthesizes the mapped evidence into mechanism statements and intervention levers [22, 23, 32]. Its novelty therefore lies not in proposing entirely new barriers but in converting dispersed qualitative evidence into a replicable explanation of barrier reproduction and a more actionable basis for institutional change.

The barriers are prevalent across the 14 cases with a reinforcement structure. Eleven of the interviewees indicated categorically that information literacy was not part of institutional talent instruction objectives or formal teacher-teaching objectives and so forth restricted the formal authority of collaboration and curriculum location. All interviewees stressed that leadership focus is able to enhance temporary coordination and access to resources, although such assistance was frequently in the form of a person-specific rather than a proceduralized form. The lack of staff and the imbalance in the teaching competence of the library workers also frequently became the subject of reports, and the formal system of work recognition and reward for collaborative teaching was reportedly weak or even absent in the majority of libraries. When these repeated patterns are superimposed upon with ILDM, they become a chain of mechanisms where policy absence leads to legitimacy, legitimacy deficit bolsters professional boundary defense, and a boundary defense reinforces incentive arrangements deterring sustained co-teaching participation [21–23].

The findings are reported according to the explanatory logic of the framework. Rather than presenting barriers as isolated items, the analysis shows how structural inertia, cognitive inertia, and political inertia reinforce one another across the collaboration process. This organization keeps the empirical description close to the interview data while also showing how the identified barriers are reproduced in institutional practice [23, 32].

Applying ILDM to the coded interview evidence produces two diagnostic outputs in addition to the descriptive themes. The first output is a barrier mechanism map that specifies how structural inertia, cognitive inertia, and political inertia reinforce one another under the competing influence of administrative logic, professional logic, and educational logic [21, 22]. The second output is an intervention mapping that links each mechanism to an institutional lever, including legitimacy design at the policy level, identity recognition at the role level, incentive alignment at the performance level, and coordination efficiency at the technology level. These outputs are intended to make the findings more actionable for institutional change because they translate interview narratives into a coherent explanation of barrier reproduction and a set of intervention entry points [23].

To come up with a better output synthesis, the themes may be centered using descriptive prevalence indicators as a result of the interview narratives. The structural barriers were also reported consistently throughout the interviews, specifically the policy legitimacy constraints, resource allocation barriers, and staffing barriers. As one example, the lack of top-level design was stressed by 11 respondents clearly, and insufficient funding and staffing levels were widely referred to as a literal constraint on teaching quality and coverage. Influences associated with leadership were also cited a lot; however, respondents highlighted that not all of them are institutionalized but manifest themselves in the form of verbal acknowledgments. The presence of cognitive barriers was manifested in the continuing professional stereotypes regarding librarianship, whereas the political barriers were manifested in the inversion of incentives, where collaborative teaching cannot always be seen as a contribution to workload or performance. Combined, these patterns suggest that the barriers do not exist as isolated entities; rather, they exist as a reinforcing structure that maintains the status quo.

In addition, the mapping results indicate that barriers are concentrated at different stages of collaboration practice. At the initiation stage, structural inertia is most visible because curriculum positioning and resource legitimacy determine whether collaboration can enter formal teaching arrangements [22]. At the joint design stage, cognitive inertia becomes more salient because professional stereotypes and unequal role recognition increase the costs of agreeing on learning outcomes and co-designed assignments [9]. At the implementation and continuation stage, political inertia is most decisive because workload accounting and performance incentives influence whether teaching teams can be maintained beyond short-term projects. This stage-based pattern extends the descriptive findings by providing a practical explanation for why collaboration may start through personal coordination but remains difficult to institutionalize.

Based on the above obstacles, this study starts from the top-level design to break down barriers, form unified cognition, and shape a common identity. In practice, drive changes through pilot projects and technology empowerment. The results also indicate a chain mechanism that describes why, even when its educational value is discovered, collaboration is challenging to scale. Lack of the top-level design and policy acknowledgement has led to a situation where the collaboration has low regulatory legitimacy in terms of resource access and formal teaching structures and puts a greater load of responsibility on the coordination process of the librarians. Such a structural situation enhances the vigor of professional boundary defense because subject departments are able to view librarianship as a support service (not co-teaching expertise) and, as such, strengthens cognitive inertia and decreases the desire to share course sovereignty. Weak legitimacy and boundary defense, in their turn, create a challenge in institutionalizing incentives, and the consequent inversion of incentives disheartens when it comes to spending time in the joint course design and evaluation. The cumulative impact is the political inertia where departments defend their workload regulations and level of authority as opposed to assuming mutual teaching responsibilities. This oriented interpretation explains the contribution of the paper to identifying the obstacles, which merely enumerates the obstacles, but fails to explain the reproduction of the obstacles by institutional conditions.

These intervention strategies should be interpreted as outputs of the diagnostic mapping rather than as independent recommendations. Because ILDM links each barrier to a sustaining institutional logic and to a reinforcing inertia dimension, the interventions are designed to shift legitimacy, identity, and incentives in a coordinated manner, rather than treating barriers as isolated problems [21–23]. This is also the methodological contribution of the paper: it provides a replicable procedure for translating qualitative evidence into a mechanism explanation and a structured set of institutional levers that can be implemented by university leadership, academic departments, and libraries.

3.3. Break down barriers with top-level design

Structural inertia stems from the rigid system and fragmented departments, which can only be solved through the power of top-level design. First, each higher education institution establishes an information literacy collaboration committee, led by school leaders, and includes leaders of relevant subjects, such as the dean of academic affairs, the director of librarians, department leaders, the director of the information center, etc., who are responsible for formulating school-wide information literacy education strategies and coordinating resource allocation. This initiative aims to change the embarrassing status quo of information literacy collaboration and use the authority of administrative logic to break down structural barriers. Second, the committee formulates an incentive mechanism to incorporate collaborative teaching into the institutionalized assessment and incentive system and encourages teachers and librarians to actively participate. Finally, a special fund will be set up to support the collaboration between teachers and librarians to ensure that collaborative teaching resources and tools are complete. This directly solves the problem of resource competition in "political inertia."

3.4. Unify cognition and shape a common identity

Cognitive inertia comes from the fixed concept, which refers not only to the different understanding of concepts and terms by librarians and other subjects but also to the wrong perception of the identity of librarians by subject teachers or faculty members. The way to solve it lies in changing the concept, abandoning the old concept of "library-assisted teaching," and jointly creating the identity of an "information literacy education partner." In addition, establish an effective communication mechanism, and communicate multiple times on the terminology, teaching content, and teaching design related to information literacy collaboration, unify cognition, improve the willingness to cooperate, and reduce the resistance to collaboration.

3.5. Promote change with pilot project

Political inertia is the greatest resistance to reform and innovation, as power and resources are involved. To break through this dilemma, the effectiveness of information literacy can be demonstrated through the pilot project of "point-to-point" to attract more teachers' participation. Organized by the committee, priority is given to colleges or majors with a strong willingness to cooperate, and the most active teachers and librarians are selected to jointly create one or two high-quality courses in information literacy. The school has given full support, encouragement, and publicity to other departments and teachers and turned the political inertia of resistance into a motivation for participation. In addition, we will increase publicity efforts and regularly organize "Information Literacy Education Salons" or workshops, inviting teachers and librarians who have successfully cooperated to share their experiences.

3.6. Technology empowers the collaboration process

Schools can use technology to reduce the cost of collaboration, making collaboration simple, efficient, and sustainable. For example, in the existing academic affairs system or learning management platform, the "Librarian Collaboration" function module is embedded. Teachers can apply for collaboration with librarians through "tick options" when applying for courses, such as "collaborative design assignments." The platform standardizes and explicitly implements the collaboration process, changing cross-departmental collaboration from "special cases" to "one-click triggering" routine services, fundamentally weakening structural inertia.

4. Experimental Section: Case Studies

4.1. Research design

Qualitative research methods are widely used in various disciplines, and this study will be developed using qualitative research methods. The goal of this study is to understand the organizational barriers that affect the implementation of collaborative teaching of information literacy in the libraries of HEIs in China, which requires interviews with librarians to gain insight into the actual situation. The use of qualitative research methods allows researchers to explore participants' understanding of information literacy practices based on exploring participants' beliefs, values, experiences, and phenomenal significance [33]. The interviewees were librarians of 16 HEIs in a provincial administrative region of China, and they were librarians who undertook the teaching task of information literacy courses or were responsible for the information literacy work of their libraries.

This study adopts a multiple case qualitative design in which each participating HEI is treated as a case of an information

literacy teaching organization, and the cross-case logic is used to identify recurring mechanisms that cannot be observed reliably in a single setting [25]. This design fits the diagnostic aim of the study, because it enables comparison across institutional types while preserving the contextual detail necessary to interpret how administrative arrangements, professional boundaries, and educational aims interact in practice. The method evaluation in this study is therefore grounded in cross-case recurrence of mechanisms and in the explanatory coherence of the diagnostic map, rather than in experimental control or statistical testing [25].

4.2. Sample selection

To preserve institutional anonymity, this study refers to the research site only as a provincial administrative region. From the perspective of higher education structure, the region provides an analytically suitable setting because it contains a relatively complete mix of public and private institutions and includes both undergraduate colleges and higher vocational colleges under the same broad provincial policy environment. This configuration allows cross-case comparison across different ownership forms and institutional missions while maintaining regional policy comparability.

There are 89 HEIs in the provincial administrative regions selected in this study, including 62 public and 27 private. Among the 62 public institutions, there are 28 undergraduate institutions and 34 higher vocational colleges, and among the 27 private institutions, there are 12 undergraduate institutions and 15 higher vocational colleges. According to the results of Entropik (Qualitative Sample Size Calculator), the total number of samples to be investigated is 16 institutions. According to the ratio of the number of public institutions to private institutions, the sample sizes of 11 public institutions and 5 private institutions were selected. In addition, since public institutions are divided into two types of institutions—undergraduate and junior colleges—public institutions will select five undergraduate colleges and six junior colleges, and private institutions will select two undergraduate colleges and three junior colleges, as shown in Table 1.

4.3. Data collection

This study will use a semi-structured interview approach to explore individual experiences and ideas in detail and collect qualitative data on answers to research questions. Moreover, this approach highlights the respondent's point of view. It is considered appropriate for this study as it will provide librarians in HEIs with in-depth, professional answers on collaborative teaching of information literacy. Compared with questionnaires, the information provided by interviews will be richer and more vividly reflect the views and values of the respondents [34].

The data collection stage is divided into two stages: the first stage is to review whether the surveyed HEIs have issued policies, standards, or guidelines on information literacy collaborative teaching, obtain information related to information literacy collaborative teaching, and lay the foundation for the second stage of interviews. The second stage is to conduct semi-structured interviews with librarians of Chinese HEIs and send interview-related documents to librarians in 16 public and private HEIs who are responsible for teaching information literacy by email, including interview questions and informed consent forms, so that they can understand the purpose and content of the interviews in advance.

4.4. Data analysis

This study will use a combination of thematic analysis and NVivo software to analyze the data. Thematic analysis is widely used in qualitative research to analyze a variety of different topics covered in selected documents to provide rich topic descriptions for the entire dataset [19]. Therefore, thematic analysis is considered most suitable for analyzing the data in this study. The use of thematic analysis helps establish clear links between the theme and the research objectives to investigate organizational barriers to information literacy collaboration in HEIs. In addition, NVivo software can help researchers analyze, code, and store interview data, and build conceptual network systems to help researchers organize, analyze, and query qualitative data [35, 36]. By using NVivo software, the scattered nodes can be grouped under diverse topics, making it easy to distill the core research findings.

Data analysis proceeded in two linked stages. First, interview transcripts were coded in NVivo through thematic analysis in order to identify recurring barrier themes that remained close to participants' language [24, 31]. Second, the coded segments were reinterpreted through ILDM, which classified barriers into structural inertia, cognitive inertia, and political inertia, and then mapped them to the institutional logics that sustained them [21, 22]. This two-stage procedure allowed the study to preserve descriptive richness while also generating mechanism statements and cross-case comparisons that explain how collaboration barriers are reproduced [23, 25, 32].

Since the objective of the qualitative research is to explain and not provide statistical generalization, this analysis is not based on inferential statistical tests. The reporting focuses on two types of complementary evidence in order to enhance transparency, as well as to provide an extra descriptive pointer of the relative importance of the most critical barriers in the dataset [37]. The former consists of direct quotations that show how people go through each barrier and perceive it. The second one will be descriptive prevalence data, that is, the number of interviewees who specifically mentioned a subtheme and how a theme will be repeated in various institutional realities. This method enhances

Table 1
Sample sizes

Levels	Type	Count	Sample
Public (62)	Undergraduate Colleges (UC)	28	5
	Higher VocationalColleges (HVC)	34	6
Private (27)	Undergraduate Colleges (UC)	12	2
	Higher VocationalColleges (HVC)	15	3
Total		89	16

the technological clarity of the findings without contradicting the qualitative design.

4.5. Demographic

The initial sample size was 16 HEIs, and 14 were finally interviewed, of which 2 institutions that were not interviewed belonged to private higher vocational colleges, which met the standard of "cases must be relevant to practice" [25]. Of the 14 HEIs interviewed, each higher education institution interviewed only one librarian who was mainly responsible for information literacy teaching or work, and the basic information of the interviewees is shown in Table 2, with an average working experience of 8.2 years, which ensured the authority of the data.

4.6. Thematic analysis based on NVivo

Through interviews with librarians from 14 HEIs, the text data were encoded and classified by thematic analysis. Data analysis utilizes NVivo, a qualitative data analysis software designed for qualitative researchers working with text-based and multimedia information. The code is called a node in NVivo. Create nodes to catalog ideas and collect material from topic cases. The specific analysis process is as follows:

Table 2
Demographic

Code	Gender	Type	Experience in years
L1	Female	Public UC	13
L2	Male	Public UC	6
L3	Female	Public UC	14
L4	Male	Public UC	10
L5	Female	Public UC	15
L6	Male	Private UC	15
L7	Male	Private UC	15
L8	Female	Public HVC	6
L9	Male	Public HVC	6
L10	Female	Public HVC	5
L11	Male	Public HVC	5
L12	Female	Public HVC	2
L13	Male	Public HVC	5
L14	Male	Private HVC	3

Data normalization: Transcribe interview recordings into text and import them into NVivo 15 software.

Open coding: Based on the analysis of the interview text, extract the original expression (e.g., "top-level design is missing") and form eight sub-topics.

Axial coding: Summarize the content of first-level open coding and extract three second-level themes.

Selection coding: By cross-comparing the expressions of multiple respondents, two core themes are summarized.

Finally, by analyzing the data and performing thematic analysis of the interview text according to the context and carefully considering and incorporating the respondents' perspectives, the resulting themes and sub-themes are shown in Table 3.

5. Analysis of Organizational Barriers to Information Literacy Collaborative Teaching

An illustrative case helps clarify how the diagnostic mapping operates at the case level. In one undergraduate institution, the absence of information literacy in official teaching objectives and syllabi created a legitimacy deficit that made collaboration dependent on informal negotiation rather than formal curriculum positioning. Under ILDM, this pattern is classified as structural inertia aligned with administrative logic, and it is interpreted as a condition that enables professional boundary defense, because subject departments can more easily frame librarianship as a support service rather than a co-teaching partner. The same case also shows how a legitimacy deficit increases the likelihood that collaborative teaching is not counted as formal workload, which contributes to incentive inversion and discontinuity of collaboration. This case-based mechanism tracing follows the logic of explanation building in multiple case qualitative research, in which cases are used to refine and exemplify mechanism statements rather than to serve as isolated anecdotes [25].

Through thematic analysis, the interview results are summarized into two main core obstacles: one is the lack of policy support, and the other is the challenge of personnel cognition. The interview data will be analyzed below:

5.1. Structural inertia: Absence of policy support

5.1.1. Organizational strategy and top-level design are missing

Top-level design: All respondents emphasized the key role of top-level design in schools. Among them, 11 respondents clearly pointed out that their institutions did not include information literacy in talent training goals. This lack of policy leads to a

Table 3
Encoding list based on NVivo

Selection codes	Axial codes	Open codes
Lack of policy support	Organizational strategy and top-level design are missing	Top-level design
		Leadership
		Incentive mechanism
		Traditional concepts
Challenges in personnel cognition	Resource security and infrastructure are weak	Fund
		Network facilities and equipment
	The shortcomings of consciousnes	Faculty
		Conscious

lack of regulatory legitimacy in collaborative teaching, making it difficult to become a core activity that is formally recognized and prioritized in the institutional environment of schools [38]. As L4 explains, the "lack of top-level design" directly leads to the marginalization of resource allocation and the lack of legitimate status of collaboration. Interviewee L4 pointed out, "The biggest obstacle is the lack of top-level design of my university, which does not include information literacy education in the teaching goals; for example, there is no information literacy content in our school's syllabus, which leads us to not know how to cooperate with departments."

Leadership: Leadership or senior management support is one of the crucial factors that affect the smooth implementation of information literacy collaborative teaching. All respondents agreed that leadership has an especially important impact on the implementation of collaborative teaching in information literacy. Data collected indicate that while management supports information literacy collaboration at eight HEIs, support is often expressed in verbal encouragement. In terms of information literacy collaboration, leadership is divided into three levels—school-level leadership, library-level leadership, and college-level leadership—which have different influences, but they all have a certain impact on information literacy collaborative teaching (Table 4).

Incentive mechanism: Rewarding has been identified as the key to effective collaborative teaching of information literacy in any organization. Among the 14 institutions interviewed, only a few institutions rewarded information literacy education, such as L2 said, "If the information literacy work is done well, the institution will still recognize it, and then it will increase some construction funds for us or reflect it in the performance reward during the year-end assessment." "Most libraries do not establish reward mechanisms and do not reward librarians and teachers for collaborative teaching of information literacy." L3 said, "Rewards play a big role in increasing the motivation of librarians and teachers. In our library, due to the imperfect incentive mechanism, some librarians have withdrawn from this course."

5.1.2. Resource security and infrastructure are weak

Funds and network facilities and equipment: Resources and infrastructure are inseparable from the support of funds. When it comes to funding, all respondents believe that funding is an important condition for information literacy education and collaborative teaching to achieve superior results. They point out that funding directly affects the quality of teaching. Sufficient funds can be used to purchase sufficient equipment and resources to ensure the quality of teaching, such as computer equipment, databases, and AI tools. L5 pointed out that "teaching equipment needs capital investment to ensure the teaching effect, for example, we have to use the computer room when we are in class, each student has a computer, after the teacher finishes the theoretical content, the students can practice on the computer, which can play a very good auxiliary role in teaching." L6 believes that "the biggest factor hindering collaborative teaching of information literacy is funding, and the lack of funds leads to a lack of teaching resources."

Faculty: As we all know, information literacy requires sufficient teachers to ensure smooth development. However, during the interview, all the interviewees pointed out that the number of professional librarians in the library is insufficient, and most of the librarians are not competent in teaching information literacy. For example, L5 said, "I am the only librarian in our institution who has always taken information literacy courses, and I have 2–3 classes every semester, which is actually far from enough." This course should cover all new students to meet our expectations, so we are short of librarians specializing in information literacy. L10 mentioned that "only 3 librarians in our library are from library majors, and the rest are non-professional. There are really few librarians who can be competent in information literacy courses, so we only carry out information literacy education through lectures, training, etc. every year."

5.2. Cognitive inertia: A shortcoming of consciousness

5.2.1. Influence of traditional concepts

The researcher learned that many subject teachers have always had a biased understanding of libraries. They believe that librarian duties are limited to managing books and are not competent for teaching tasks. As interviewee L2 said, "I think there is a deep-rooted concept in it. Professional teachers or other faculty members always feel that we are managing books, and it seems that we are not capable of doing things in class." L5 made the same point, "They believe that library people don't need to do anything, and this idea will affect the professional librarians of the library."

5.2.2. The shortcomings of consciousness

The influence of school leaders' awareness on information literacy collaborative teaching is multidimensional and deep-seated, and its cognitive level, attention, and action orientation directly determine the promotion effect, resource guarantee, and sustainability of this teaching model. Most respondents agreed with the above views, such as L2 emphasized, "The good or bad collaborative teaching of information literacy is actually related to the importance of leaders; that is, whether they realize that this work is more important." L4 said, "First, leaders must have this awareness, attach importance to information literacy education and its collaboration, and include information literacy in the talent

Table 4
The influence of leadership

Leadership	Influence	Typical expression
University-level leadership	Resource allocation rights	L13: "After the vice principal's instructions, the funds were immediately in place."
Library leadership	Cross-departmental consultation efficiency	L2: "The curator came forward, and the collaboration between the departments was greatly improved."
Faculty-level leadership	Teacher participation is mandatory	L4: "The head of the department mandates the collaboration of teachers."

training plan, so as to guide librarians and professional teachers to carry out collaboration."

5.2.3. Political inertia: Deep obstacles

After analyzing the interview data, it was found that the factors restricting collaboration on the surface are resource limitations, but in fact, it is caused by organizational inertia. Due to the constraints of organizational systems and rules, each department is accustomed to going alone, doing its own thing, and lacking a sense of collaboration. For example, L7 said, "The department did not communicate with us when scheduling the class, but just showed us it after the arrangement, and then they did not adopt it after we put forward our opinions." In addition, there are perverse incentives, which refer to the systematic punishment of collaborative behavior in the management system. Most institutions do not include collaborative teaching in the workload of librarians, resulting in inactive teacher collaboration. L3 reveals: "The lack of incentives has led to a decrease in the number of librarians participating in information literacy courses in our libraries." This reveals the deep challenge of organizational change in China's HEIs, where explicit resource constraints and implicit institutional lock-in are superimposed [38], and the system tends to maintain the status quo even if there is a value consensus.

At one of the public undergraduate institutions, there was no information literacy in the form of information literacy in the official syllabus and the teaching goals, so the collaborative teaching was unable to become part of the formal arrangement of the curriculum. The university lacked information literacy education as a teaching objective and lacked information literacy material in the syllabus; this placed the library in a dilemma about the way to liaise with departments, as explained by L4. This type of pattern under ILDM is considered to represent a structural inertia along with administrative logic since the constraint is entrenched in the formal curriculum design and teaching governance. The identical lack of legitimacy also facilitated the issue of boundary defense when collaborating in negotiations, as the subject departments were much more able to put librarianship into supporting service-related frames as opposed to presenting librarianship as expertise in co-teaching, which caused joint planning to become more prohibitively expensive and exposed more unequal access to assessment opportunities.

The friction to coordination was minimized; however, temporary in another institution due to the leadership concern. One of the interviewees explained that once the vice principal had commanded, the money became available, and another mentioned that when the library director came to the fore, the efficiency of consultation between the departments had increased. These stories can explain how administrative power can unify resources and coordination in instances where teamwork is valued. Nonetheless, participants also reported that these improvements are frail when they are dependent on personal leaders as opposed to institutionalized workload regulations and rewards. Under no condition of integrating collaborative teaching as a formal workload or contribution to performance, librarians and teachers experience extra teaching preparation and receive little credit, and the participation falls over time. An ILDM analysis predicts that short-term structural inertia can be broken by leadership-led coordination, but without the coordination of incentives, this does not stop political inertia from reproducing discontinuity of collaboration [21–23].

Under the missing top-level design is a legitimacy deficit. A librarian in a single undergraduate institution said that information literacy was not in the official teaching objectives and that there is no information literacy curriculum in our school, which created a confused perception on how to collaborate with departments. There is no official curriculum role, and thus, teamwork will rely on informal negotiation, and this creates difficulties in both guaranteeing consistent time in the classroom, co-design work, or integrating learning outcomes into course evaluation. The given vignette demonstrates that the impact of structural inertia gives rise to the legitimacy deficit that undermines collaboration prior to the stage of pedagogical design.

Coordination that came as a result of leadership is person dependent. Interviewees also explained how leadership attention can lead to the temporary overcoming of structural barriers. Indicatively, one of the respondents pointed out that the funds were right there, at the behest of the vice principal, and another pointed out that the curator came forward, and the cooperation of the departments was very much enhanced. These examples indicate that administrative power is able to marshal resources and coordination at rapid speeds, and of course, they also indicate that, in these cases, cooperation is frail when depending on individual intervention instead of institutionalized policies, procedures, and incentive harmonization.

Incentive reversal and movement out of cooperative instruction. There are a few instances that depict political inertia using incentive schemes that penalize collaboration by adding more work with no rewards. As stated by one respondent, rewards have a large part in enhancing the motivation of librarians and teachers, although the respondent further noted that as a result of an imperfect incentive mechanism, there are librarians who have already dropped this course. As long as collaborative teaching is not calculated as formal workload or a performance contribution, then participation will be hard to maintain, and collaboration will be short-term projects that do not last as long as staffing or daily service demand.

Boundary defense of professionalism and identity misrecognition. Cognitive inertia can be seen in the way the subject teachers view librarianship as a service provider and not a teaching partner. According to one respondent, professional teachers always have the feeling that they are handling books, and another had an impression that library people do not need to do anything, which influences the way librarians are identified in the teaching scenarios. These attitudes directly enhance the cost of collaboration by reducing the belief in the teaching ability of librarians and by promoting the idea of subject-led decision-making that constrains collaborative planning as well as co-creation.

6. Conclusion

Through in-depth interviews and qualitative analysis, this study systematically reveals the deep organizational obstacles faced by collaborative teaching of information literacy in Chinese HEIs. Beyond the superficial attributions such as "lack of awareness" and "poor communication," this study constructs an analytical framework composed of "institutional logic" and "organizational inertia," which demonstrates that the essence of the collaborative teaching dilemma is that the "educational logic" aimed at promoting change cannot play a role in the organizational inertia constructed by the alliance of "administrative logic" and "professional logic."

Specifically, this study identifies three mutually reinforcing barrier mechanisms: (1) structural inertia manifests as the lack of top-level policy and systemic resource support, which makes collaboration lose its regulatory legitimacy and development foundation; (2) cognitive inertia is reflected in the traditional concept of "librarians are not the main body of teaching," which

has become a cultural shackle that hinders cross-departmental trust and recognition; and (3) political inertia is reflected in the inversion of incentive mechanisms and power barriers between departments, systematically punishing collaborative behavior and rewarding the maintenance of the present. These findings show that the difficulty of collaborative teaching does not stem from individual will or technical means but from institutional obstacles deeply rooted in the organizational fabric of colleges and universities.

In terms of theoretical contributions, this study provides a powerful analytical tool by introducing the theories of "organizational inertia" and "institutional logic" into the field of information literacy collaboration and provides a theoretical perspective for understanding the implementation dilemmas of other educational innovations in similar institutional environments. In terms of practical implications, this study points out that systematic institutional intervention is needed to solve the dilemma, rather than sporadic skill adjustments. The comprehensive strategy of "top-level design, cognitive reshaping, pilot promotion, and technology empowerment" proposed by us provides university administrators and library leaders with a full-chain action roadmap from breaking down structural barriers, reversing indigenous concepts, resolving power resistance, and reducing collaboration costs.

From the perspective of AI applications, the findings indicate that the effective educational use of AI is not determined by technology availability alone. Even when AI tools, databases, and digital platforms are available, the institutionalization of AI-related information literacy teaching still depends on curriculum legitimacy, role recognition, incentive alignment, and cross-departmental coordination. Organizational diagnosis is therefore a necessary complement to technical discussions of AI in education, because it explains why responsible and sustainable AI-related teaching practices remain difficult to scale in universities.

However, this study also has limitations. The study sample is concentrated in a provincial administrative region, and future studies can be tested and compared in a wider area. At the same time, this study starts from the perspective of librarians and can be expanded to include the perspectives of teachers, academic administrators, and students in the future to build a more comprehensive picture. In addition, it will be a valuable research direction to conduct an in-depth analysis of a few "positive cases" that have successfully broken through the predicament and to explore the driving factors and implementation paths behind them. At a time when AI technology is reshaping the form of education, the connotation of information literacy is accelerating its expansion to AI literacy. Opening the institutional path of collaborative teaching is not only the key to improving the quality of current information literacy education but also laying a solid foundation for cultivating digital citizens with critical thinking and responsible innovation capabilities in the future.

Even though ILDM could be operationalized as a systematic mapping process, the present research works with it in the form of researcher-led coding backed by NVivo, so suited to the explained mechanisms in a qualitative study methodology. Future studies may involve computational aid to the process, such as through natural language processing to recognize statements of barriers in transcripts, offering preliminary categorizations into structural, cognitive, and political inertia, and other productions of draft matrices to be studied by researchers. These tools have the potential to enhance efficiency and replicability in using ILDM on larger datasets or on multistakeholder data that incorporate teachers, administrators, and students and still fulfill the interpretive burden that qualitative analysis demands.

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Ethical Statement

The authors declare that this study did not require formal ethical approval because Universiti Teknologi MARA does not require Institutional Review Board or ethics committee approval for semi-structured interviews.

Conflicts of Interest

The authors declare that they have no conflicts of interest in this work.

Data Availability Statement

The data that support the findings of this study are openly available in figshare at https://figshare.com/articles/dataset/Raw_data/32130100.

Author Contribution Statement

Shanfang Qin: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing, Project administration. **Ap-azli Bunawan:** Conceptualization, Methodology, Validation, Writing – original draft, Writing – review & editing, Visualization, Supervision. **Nor Erlissa Abd Aziz:** Conceptualization, Software, Resources, Data curation, Writing – review & editing, Visualization, Supervision.

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