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How First-Year Health Sciences Students Cope with Digital Library Barriers in an English-Medium University: A Qualitative Study

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Abstract

Digital libraries are essential to evidence-informed learning in the health sciences, yet first-year students may struggle with database selection, authentication, search syntax, and the linguistic demands of English-medium instruction (EMI). Less is known about how students adapt when formal library support does not fully resolve these difficulties. This qualitative study examined the coping strategies developed by first-year health sciences students when navigating digital library systems at a comprehensive EMI university. Twelve first-year undergraduates representing multiple health sciences programmes participated in virtual semi-structured interviews. Data were analysed using reflexive thematic analysis following Braun and Clarke's approach. Three interconnected themes were developed. First, peer-brokered procedural learning enabled students to acquire database skills through classmates and senior students who could explain search processes in accessible, context-specific terms. Second, messaging-based support communities functioned as informal knowledge infrastructures in which students circulated screenshots, step-by-step guides, short videos, and answers to re-

curing access problems. Third, students used strategic resource substitution when institutional databases became too difficult or time-consuming under deadline pressure, moving toward Google Scholar, open web sources, and general reference sites. These strategies helped students maintain academic functioning, but they also created risks related to uneven access to knowledgeable peers, inconsistent advice, and variable source quality. The findings suggest that informal peer scaffolding is not peripheral to digital-library use but an important part of how first-year students manage information-seeking demands. Institutions should therefore combine formal information-literacy training with trained peer navigators, librarian-verified student-generated resources, and just-in-time support embedded in the digital environments students already use. Because this was a small, single-site qualitative study based on self-reported experience, the findings are interpretive rather than generalizable and should be examined in larger, multi-institutional research.

Keywords: digital libraries, information literacy, peer-assisted learning, health sciences education, English-medium instruction, qualitative research

1. INTRODUCTION

Digital libraries are central to contemporary health sciences education because they provide access to journal literature, clinical evidence, reference resources, and specialist databases that students need for coursework and evidence-informed decision making. Access alone, however, does not guarantee effective use. Digital-library systems require users to identify appropriate databases, authenticate access, formulate searches, apply filters, interpret interfaces, and evaluate retrieved sources. Research in health-professions education has repeatedly shown that these tasks can present substantial challenges. In Saudi Arabia, a usability study of the Saudi Commission for Health Specialties digital library reported below-average overall usability and found that prior training was associated with better usability scores [1]. Studies of medical students in other settings have likewise identified limited awareness of academic databases, uncertainty about search techniques, and difficulty using tools such as Boolean operators [2]. Among first-year dental students, Kingsley and colleagues found important deficits in information-literacy skills, including difficulties locating evidence-based citations, reinforcing the need for explicit training early in professional education [3].

These information-seeking demands may become more complex in English-medium instruction (EMI) settings. Saudi medical students studying through EMI report challenges in reading medical materials, understanding disciplinary language, and participating in English-mediated academic tasks [4]. A systematic review of EMI in Saudi higher education similarly identifies recurrent linguistic and cultural adaptation demands across programmes, particularly in applied fields such as medicine and engineering [5]. Within a Saudi EMI health-sciences university, Althewini [6] specifically examined freshmen's perceptions of facilities, equipment, and digital-library resources, demonstrating that digital-library experience is a meaningful component of students' broader academic environment. These findings suggest that first-year health sciences students may encounter overlapping technical, informational, and linguistic demands when beginning to use institutional research systems.

Most published work in this area has focused on access, satisfaction, usability, or measured information-literacy competence. These perspectives are important, but they tend to position difficulty as an individual or institutional deficit. Less attention has been paid to what students actually do when formal orientation, help pages, or scheduled library support are insufficient for an immediate academic task. This distinction matters because students do not simply stop working when they encounter a difficult database. They ask classmates, consult senior students, exchange screenshots, create informal guides, use messaging groups, and, when necessary, substitute more familiar tools for institutional databases. Such practices constitute an adaptive layer of learning that may be largely invisible in formal curriculum and library evaluation.

Peer-assisted learning provides a useful lens for understanding part of this adaptation. A recent scoping review of systematic reviews found broad evidence that peer-assisted learning can support health-professions education across multiple outcomes and contexts [7]. Qualitative research with medical students further shows that informal peer-assisted learning includes explanation, clarification, resource sharing, procedural guidance, and support that extends beyond formal teaching sessions [8]. Digital communication platforms can expand this process from one-to-one assistance into persistent networks. Studies of WhatsApp in higher education have shown its usefulness for collaborative learning, resource exchange, reciprocity, and academic communication [9, 10], while work with first-year university students illustrates how messaging groups can function as continuing induction and support environments [11]. Nevertheless, these studies have not focused specifically on how peer networks mediate access to digital-library systems.

A second underexamined issue is strategic resource substitution. When students cannot retrieve evidence efficiently through formal systems, they may move to tools that are familiar, fast, and accessible. This does not necessarily indicate indifference to information quality. Rather, it may represent a rational response to time pressure, authentication friction, low confidence, or gaps in search competence. The educational risk is that a successful short-term workaround can reduce opportunities to develop more advanced database skills and can expose students to sources of uneven quality. Understanding when and why substitution occurs is therefore important for information-literacy teaching as well as library-service design.

The present study examines how first-year health sciences students cope with difficulties encountered when using digital libraries in an EMI university. It shifts the analytical focus from whether students are satisfied with library services to how they construct practical support systems around those services. Three research questions guided the study:

- (1) What peer-based strategies do first-year students use to develop digital-library competencies?
- (2) How do students organize informal support communities for sharing navigational knowledge? and
- (3) Under what circumstances do students move from institutional databases to alternative research resources?

2. METHOD

2.1. STUDY DESIGN AND SETTING

A qualitative, interpretive design was used to examine how first-year students understood and enacted coping strategies around digital-library use. Semi-structured interviews were selected because the study sought detailed accounts of how students responded to specific access and navigation problems, how they learned procedural knowledge from others, and how they decided between formal databases and alternative resources. The study was situated within a comprehensive EMI health-sciences university in which students were expected to engage with English-language academic materials and electronic research systems from the beginning of their undergraduate programmes.

2.2. PARTICIPANTS AND RECRUITMENT

Twelve first-year undergraduate students were recruited purposively to capture experiences across health-sciences programmes. Participants represented Applied Medical Sciences ($n=2$), Medicine ($n=2$), Nursing ($n=2$), other health-sciences programmes ($n=4$), and mixed programme pathways ($n=2$). All participants had completed secondary education in Arabic and were encountering sustained English-medium academic study for the first time in higher education. This transition made the first year particularly relevant for examining how students learned to navigate research systems while simultaneously adapting to new disciplinary and linguistic demands.

Recruitment materials were provided bilingually. Participants were assigned anonymized identifiers (Student 1 to Student 12) for reporting. The purpose of purposive recruitment was to obtain information-rich accounts across different programme contexts rather than to produce a statistically representative sample.

2.3. DATA COLLECTION

Virtual semi-structured interviews were conducted over a five-month period during the academic year. Each interview lasted approximately 40–60 minutes. The interview guide addressed three broad domains: students' day-to-day experiences of seeking academic sources for assignments; the people, resources, and communication channels they used when formal library systems were difficult to navigate; and the alternative tools or websites they used when institutional databases did not meet an immediate need. Follow-up prompts explored how peer guidance occurred, how messaging groups accumulated and circulated practical knowledge, how students evaluated conflicting advice, and how deadlines affected information-seeking decisions.

Virtual interviewing offered logistical flexibility while keeping the discussion closely connected to the digital context under investigation. Participants were able to describe authentication, database selection, filtering, off-campus access, and other online processes in concrete terms rather than only in the abstract.

2.4. DATA ANALYSIS

Interview data were analysed using reflexive thematic analysis. The analysis followed the six broad phases originally described by Braun and Clarke [12]: familiarization with the dataset, generation of initial codes, development of candidate themes, review of themes against the dataset, refinement and naming of themes, and production of the analytic account. Later guidance on reflexive thematic analysis informed the treatment of themes as interpretive constructions rather than objective categories waiting to be discovered [13, 14].

Coding attended to students' descriptions of help-seeking, procedural learning, peer exchange, messaging-group practices, persistence with institutional systems, and shifts to alternative sources. The analysis also examined variation and contradiction, including students' concerns that peer advice could be incomplete or incorrect and their recognition that convenient sources were not always academically ideal. Because the study used reflexive thematic analysis, coder agreement statistics were not treated as a criterion of analytic quality; instead, emphasis was placed on coherence between the research questions, coding, theme development, supporting quotations, and interpretation [14].

Ethical approval was obtained from the institutional review board. Informed consent was obtained from all participants after explanation of the study purpose, data protections, voluntary participation, and the right to withdraw without penalty.

3. RESULTS

Three interconnected themes were developed: peer-brokered procedural learning, messaging-based support communities, and strategic resource substitution. The themes describe different parts of a single coping system rather than isolated behaviours. Peer learning helped students solve immediate problems and acquire procedures; messaging communities stored and circulated those procedures across the cohort; and alternative research paths were used when formal databases and peer support did not provide a sufficiently rapid solution. Table 1 summarizes the analytic structure.

Table 1. Summary of themes, adaptive functions, and associated risks

Theme	Typical practices	Adaptive function	Potential risk
Peer-brokered procedural learning	One-to-one explanations from classmates and senior students; contextualized database advice; use of accessible language and practical shortcuts	Provides responsive, task-specific guidance and lowers the threshold for learning unfamiliar systems	Advice may be incomplete, context-specific, or incorrect; support depends on access to knowledgeable peers
Messaging-based support communities	Group questions and answers; screenshots; shared PDF guides; short videos; collaboratively updated resource lists	Extends support beyond scheduled sessions and creates a reusable repository of procedural knowledge	Contradictory guidance, uneven participation, lack of expert verification, and reduced support during high-demand periods
Strategic resource substitution	Movement from institutional databases to Google Scholar, open web sources, or general reference sites when time or access barriers persist	Enables task completion when formal systems feel too slow or difficult under deadline pressure	Variable source quality and fewer opportunities to develop advanced database-searching skills

Peer-brokered procedural learning. Across the interviews, participants described learning to use digital-library systems primarily through classmates or senior students when formal orientation did not resolve a specific problem. Students contrasted broad introductory sessions with the immediacy of peer explanation. What mattered was not only that peers knew the technical steps, but that they could identify the exact point at which another student was confused, repeat an explanation, and connect a database to the requirements of a particular programme or assignment.

“The librarian showed us everything at once in the first week. By the third step I had already lost track. My friend from second year sat with me for an hour and went through just the parts I needed. That actually worked.” (Student 4)

“When I could not find an article, I did not go back to the library training slides — I asked the person sitting next to me. She knew exactly which filter to use and why. I learned more in five minutes than from the whole session.” (Student 9)

Senior students were particularly valued because they combined procedural knowledge with recent experience of the same programme requirements. Their guidance was therefore interpreted as immediately relevant rather than generic.

“The senior students know which databases matter for nursing assignments specifically. The general training does not tell you that. They told me to use this one database and forget the others for now — that was exactly what I needed.” (Student 2)

“My older classmate explained it in terms I understood. She used Arabic when the English was confusing, and she knew the shortcuts. A librarian explaining in formal English is not the same thing.” (Student 7)

Participants nevertheless recognized an important limitation: procedural proximity did not guarantee accuracy. Students could reproduce a shortcut without knowing whether it represented good search practice, and advice that worked for one assignment might not transfer to another.

“We help each other a lot, but sometimes I wonder if what my friend taught me is actually the right way or just the way she happened to figure out. We do not always know if we are doing it properly.” (Student 11)

Messaging-based support communities. Peer assistance extended beyond direct interpersonal explanation. Participants described messaging groups as persistent support spaces in which questions, solutions, screenshots, step-by-step guides, and links accumulated over time. These groups functioned as informal knowledge infrastructures because a solution generated for one student’s problem could later be reused by the entire cohort.

“We made a group at the beginning of the year and now it has everyone. When someone figures out how to access full-text articles from home, they post a screenshot with the steps. The whole group benefits from one person’s discovery.” (Student 1)

“If I cannot remember how to limit a search by date or by study type, I just post in the group. Someone always knows. It is faster than searching the library website for help and far faster than emailing anyone official.” (Student 6)

The most valued resources were often concrete and reusable. Students described PDF guides, annotated screenshots, short videos, and collaboratively maintained lists that explained which database to use for a particular purpose.

“Someone made a PDF guide for accessing PubMed from off-campus and shared it in the group. I must have used that document ten times. Nobody official gave us anything like that.” (Student 3)

"There is a document we all share — it lists the databases and what each one is good for. I do not know who first made it. Different people have added to it. It is more useful to me than any official resource." (Student 8)

The same characteristics that made these communities flexible also made them fragile. Advice could conflict, no formal mechanism existed for checking accuracy, and the availability of help depended on whether other students had time to respond.

Strategic resource substitution. When institutional databases remained difficult to access or navigate, particularly under deadline pressure, some students deliberately moved to more familiar tools. Participants did not generally present this as a rejection of academic databases. Instead, they described a sequence of escalating compromises: attempt the formal database, ask peers for help, and then use a simpler source if neither route produced a timely result.

"When I have two days before a deadline, I cannot spend one of them trying to remember the password system and the database filters. I go to Google Scholar because I know how it works. I can get something usable in twenty minutes." (Student 5)

"I have tried to use the databases properly and sometimes I manage. But when I cannot, I use other things. Wikipedia to understand the topic, then find a source from there. I know it is not ideal, but I have to submit something." (Student 10)

This strategy preserved academic productivity, but students were aware that convenience could come at the cost of search quality or source selection. Their accounts therefore reflected not an absence of standards but a trade-off between perceived quality and the time required to obtain usable material.

"Sometimes I get an answer from Google Scholar and just cite whatever I find there. I know the proper databases have better articles, but I have not learned them well enough yet to use them under pressure." (Student 12)

"My classmate asked me once why I always use open sources instead of the library databases. I told her honestly — I still do not feel confident enough in the library system to use it when it matters." (Student 7)

Across participants' accounts, persistence with institutional databases appeared closely connected to the availability of responsive peer scaffolding. Students who described active access to knowledgeable peers were more able to obtain rapid procedural help, whereas students with less immediate support described a greater tendency to rely on alternative pathways. This pattern should be interpreted qualitatively rather than as a measured association, but it suggests that peer-network access may shape not only how students learn digital-library skills but also which evidence environments they ultimately use.

4. DISCUSSION

This study examined how first-year health sciences students in an EMI university responded when digital-library use became difficult in the course of ordinary academic work. The central finding is that students built an informal support architecture around the formal library system. Peer-brokered procedural learning addressed immediate gaps in know-how; messaging communities converted individual solutions into shared resources; and strategic resource substitution allowed students to complete assignments when the first two mechanisms did not produce a sufficiently rapid solution. The contribution of the study is therefore not simply to document dissatisfaction with a digital library, but to show how students actively reorganize access to procedural knowledge when formal support and immediate academic demands do not align.

The findings are consistent with research showing that digital-library usability and training are closely connected. Jamal and colleagues [1] reported low usability of a Saudi health-sciences digital library and found that prior training was associated with better usability scores. Their study also documented colleagues and WhatsApp among the channels through which users became aware of the library, indicating that informal interpersonal routes already coexist with institutional communication. The present findings extend that observation by showing how peer channels may become not only sources of awareness but also practical systems for troubleshooting authentication, selecting databases, applying filters, and interpreting search interfaces.

The results also fit the broader literature on information literacy in health-professions education. Wong and colleagues [2] identified not knowing where or how to locate databases and uncertainty about Boolean operators as important barriers among medical students. Kingsley and colleagues [3] found significant information-literacy deficiencies among first-year dental students and used those findings to justify targeted educational intervention. Taken together with the present data, this literature suggests that the challenge is not simply access to electronic resources. Students require procedural fluency: the ability to move from an information need to an appropriate database, construct a workable search, recognize relevant evidence, and recover when a search does not behave as expected.

Peer learning appears to provide part of this procedural fluency because it is highly situated. Formal training typically has to cover multiple systems and generic principles within limited time, whereas a peer can respond to a narrowly defined problem at the moment it occurs. This interpretation aligns with Morris and colleagues' [8] qualitative account of informal peer-assisted learning among medical students, where peers explained difficult points, shared resources, guided one another, and supplied practical help both inside and outside formal teaching. It is also compatible with the broader evidence synthesized by Feng and colleagues [7] on the educational value of peer-assisted learning in health-professions education.

However, peer support should not be romanticized. The interviews show that students themselves recognized the epistemic weakness of unverified guidance. A shortcut can be efficient without being complete, and a student who learns only which button to click may not understand the information-retrieval principle behind the action. The institutional implication is therefore not to replace librarians with peers but to connect the accessibility of peer learning with the accuracy of expert support. Trained student library navigators, co-designed orientation sessions, or librarian-verified peer guides could preserve the linguistic and contextual advantages of student-to-student explanation while reducing the risk of misinformation.

The messaging-group findings add a second layer to this argument. Prior research shows that WhatsApp can support collaborative learning, resource exchange, reciprocity, and continuing academic communication in higher education [9, 10]. Rabotapi and Matope [11] further illustrate how WhatsApp groups can support first-year students' induction into university systems. The present study suggests a more specific function: messaging groups can become distributed repositories of procedural knowledge. Their value lies not only in conversation but in persistence. Screenshots, short videos, and shared documents remain available after the original problem has been solved, allowing one student's discovery to become part of a cohort's informal infrastructure.

This distributed support nevertheless creates an equity issue. Informal systems reward students who are well connected to active and knowledgeable peers. Students who are socially peripheral, reluctant to ask questions, or members of less active groups may have access to the same institutional subscriptions but not to the same practical scaffolding. In that sense, digital-library access has both a technical and a social dimension. Equal credentials do not necessarily produce equal usable access if the tacit knowledge required to navigate the system is distributed unevenly through peer networks.

The third theme, strategic resource substitution, should likewise be interpreted as more than poor academic practice. Students described choosing Google Scholar or general web resources when authentication, filtering, or database unfamiliarity became too costly under deadline pressure. Such decisions resemble a form of friction management: students select the pathway that offers the lowest perceived cost for producing an acceptable assignment. This helps explain why institutions can invest heavily in licensed databases while students continue to rely on simpler search environments. It also suggests that measures of library availability or subscription volume are insufficient indicators of educational impact.

The educational response should therefore address both competence and friction. First-year information-literacy instruction should be distributed across the semester rather than concentrated in a single orientation session. Short, assignment-linked demonstrations delivered at the moment students first need a particular database may be more useful than broad early exposure to many systems. Second, institutions should develop "just-in-time" resources: concise search demonstrations, troubleshooting guides, authentication instructions, and database-selection maps that are searchable and easy to share. Third, student-generated guides can be incorporated into formal support if they are reviewed periodically by librarians. Fourth, institutions should monitor not only whether students can technically log in but where they abandon formal systems and why.

The findings also have implications for digital transformation in health sciences education more broadly. Prosen and Ličen [15] emphasize that effective digital transformation depends on pedagogical and organizational conditions, not simply the presence of technology. The same principle applies to digital libraries. A high-quality platform is educationally valuable only when students can reliably convert access into competent information seeking. The gap between provision and usable practice is therefore a curriculum issue as well as a library-service issue.

Several limitations should be considered. First, the study was conducted at a single EMI health-sciences university, and the findings should not be assumed to represent students in other institutions, disciplines, or national contexts. Second, purposive sampling was appropriate for obtaining information-rich accounts but does not support prevalence estimates. The quotations and themes indicate patterned experiences within this dataset; they do not establish how frequently each strategy occurs in the wider student population. Third, the study relied on self-reported interviews rather than direct observation of search behaviour, screen recordings, database logs, or independent assessment of information-literacy competence. Consequently, students' descriptions of how they searched cannot be equated with objectively measured search performance.

Fourth, the sample included multiple programme groups but was too small for meaningful comparison among disciplines. Fifth, informal support itself may have shaped recruitment: students embedded in stronger peer networks may have been more visible or easier to recruit than highly isolated students. Finally, reflexive thematic analysis is interpretive. The

themes represent an analytic account of meaning across the dataset rather than fixed categories that would necessarily be reproduced identically by another analyst [13, 14].

Future work should combine qualitative interviews with direct observation of digital-library use, search-task performance, and usage-log data. Multi-institutional studies could examine whether similar peer infrastructures develop across different EMI environments and whether they vary by discipline, gender, campus, or prior experience. Intervention studies could test whether trained peer navigators, librarian-verified messaging channels, or distributed just-in-time information-literacy teaching improve database persistence, search quality, and source selection without undermining the responsiveness that makes informal peer support attractive.

5. CONCLUSION

First-year health sciences students do not respond to difficult digital-library systems only by disengaging. In this study, they constructed an adaptive support architecture based on peer-brokered procedural learning, messaging-based knowledge sharing, and strategic use of alternative research pathways. Peer support helped students translate general orientation into task-specific action, while messaging communities preserved and distributed practical knowledge across the cohort. When these forms of scaffolding were unavailable or too slow, students moved toward simpler information sources that allowed them to meet immediate academic demands.

These strategies are educationally useful but not risk-free. Their effectiveness depends on access to knowledgeable peers, the accuracy of informal advice, and students' capacity to distinguish convenient sources from appropriate evidence. The most constructive institutional response is therefore not to suppress informal coping practices but to connect them with formal expertise. Trained peer navigators, librarian-verified student resources, repeated assignment-linked instruction, and low-friction technical support could transform an improvised coping system into a more equitable and reliable information-literacy infrastructure. The findings position peer-brokered procedural knowledge as a central mechanism in students' adaptation to digital-library barriers while also underscoring the need for larger and more direct studies of how these practices affect actual search behaviour and evidence quality.

CONFLICTS OF INTEREST

The author declares no conflicts of interest.

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DATA AVAILABILITY

Data supporting the empirical analysis and the findings reported in this study are available from the corresponding author upon reasonable request, subject to applicable ethical and confidentiality requirements.

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