

Librarian Expertise, Responsiveness, and Virtual Reference Service Quality: Do Communication Channels Matter?

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Abstract – This study examines the impact of librarian expertise and responsiveness on virtual reference service (VRS) quality, focusing on the mediating role of communication channels. Data were gathered via Google Forms survey involving 161 university librarians in Indonesia and analyzed through structural equation modeling using Lisrel 8.8 to assess validity, reliability, and relationships between variables. Results indicate that librarian expertise and responsiveness significantly contribute to the overall quality of VRS. Furthermore, communication channels were found to play a crucial role in enhancing the influence of librarian expertise and responsiveness on service quality. These findings suggest the importance of effective communication strategies in shaping user experiences within VRS platforms. The study offers valuable insights into the dynamics of VRS and underlines the significance of communication channels as mediators between librarian actions and service quality.

Keywords – Librarian expertise, librarian responsiveness, virtual reference service quality, communication channels.

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1. Introduction

Providing quality virtual reference services to diverse students is critical, as the number of non-traditional students pursuing higher education increases rapidly, and they may have different needs and preferences when accessing library services [1]. Virtual reference services have become vital to libraries in an increasingly digital and interconnected world. Ensuring a high level of quality in these services is essential for effectively meeting users' information needs.

The urgent need for research on virtual reference services in university libraries arises from several essential factors. Virtual reference services and digital resources are closely related as they both involve using technology to provide information and assistance to users. Librarians in virtual reference services can utilize these digital resources to assist users in finding relevant information, evaluating sources, and using information effectively [2]. The integration of virtual reference services and digital resources has expanded the reach of libraries beyond physical buildings, allowing them to provide trustworthy knowledge and support to users in the virtual environment.

Various factors shape the quality of virtual reference services, including librarian expertise, responsiveness, and the communication channel used. Librarian expertise plays a crucial role in ensuring the effectiveness of virtual reference services [3]. Additionally, the responsiveness of librarians and the availability and usage of communication channels such as chat services, email, phone, video chat, and text messaging impact the overall quality of virtual reference services [4]. Furthermore, the use of synchronous methods of communication, such as chat environments and instant messaging, has been identified as a significant development in virtual reference services, highlighting the importance of responsiveness and real-time interaction [5].

The choice of communication channel can significantly impact the security and reliability of virtual reference services.

The study of virtual reference services in academic libraries has also revealed the need for reliable and deniable communication channels, emphasizing the significance of secure and trustworthy communication methods [6]. Moreover, investigating covert communication channels within unconventional means of transmitting information underscores the critical need to grasp various communication avenues' potential risks and vulnerabilities [7], [8].

In this study, the authors will further examine the influence of librarian expertise and responsiveness on the quality of virtual reference services (VRS) and explore the mediating role of communication channels in this relationship. The findings of this study will provide valuable insights for librarians and service providers to enhance their practices and optimize the user experience. Through a comprehensive analysis, we can identify the key factors that influence the effectiveness and efficiency of virtual reference services, ultimately leading to improved service delivery.

2. Literature Review

In this section, the variables utilized in the study and their respective properties are expounded upon to establish a foundation for examining relationships among them and formulating the research framework.

2.1. *Quality of Virtual Reference Service*

The quality of virtual reference services is crucial for meeting the evolving information needs of users in the digital era. Quality can be defined as the effectiveness and excellence in providing reference assistance through digital channels, encompassing promptness of response, accuracy of information, clarity of communication, professionalism, coverage of user needs, and continuous improvement [9]. Promptness of response is crucial and can be assessed through linguistic stylometric patterns in librarians' responses, categorized into stylometric richness, stylometric brevity, and interpersonal support [10]. Innovative information technology tools benefit from incorporating challenges and supporting students [11]. The accuracy of the information provided is equally important, emphasizing the significance of cross-referencing and verification to ensure reliable information [12].

Clarity of communication emphasizes the significance of adopting a communicative

methodology that recognizes the evolving needs of individuals and systems over time [13]. Professionalism is vital for librarians' growth, with challenges such as limited funding for professional development [14]. Meeting user needs and continuous improvement are also crucial aspects of the quality of virtual reference services [15], [16].

2.2. *Librarian Expertise*

Virtual reference service expertise refers to the specialized knowledge, skills, and proficiency that librarians or information professionals possess in delivering effective and high-quality reference services in a virtual or online environment. The impact of librarian expertise on virtual reference service quality has been the subject of extensive research, shedding light on the relational aspects of virtual reference services, emphasizing the importance of understanding communication dynamics and the role of librarian expertise in virtual interactions [17]. This expertise is essential for navigating the digital landscape and meeting the informational needs of users who seek assistance remotely. Several key components represent the expertise of virtual reference services, including information retrieval skills, research techniques, digital literacy, and customer service skills.

Information retrieval skills involve efficiently accessing, evaluating, and incorporating information, contributing to researchers' knowledge base [18]. Reference librarians guide researchers in cultivating robust information retrieval skills, enhancing the quality of scholarly work [19]. Librarians possess essential research skills, including structured thinking, information management expertise, effective communication, and knowledge dissemination proficiency [20]. In virtual reference services, these skills are vital as librarians navigate digital environments to provide accurate assistance and leverage bibliometrics for research assessment. Digital literacy is the skill needed to navigate and harness digital resources and technologies [21]. Librarians acquire digital literacy skills to effectively use email, social media, database searching, metadata development, digitization, and emerging technologies, ensuring comprehensive and efficient virtual reference services.

Customer service practices involve meeting the needs and expectations of users through prompt and efficient responses, active solicitation of feedback, and accessible service delivery [22]. In virtual reference services, librarians prioritize customer service, creating positive and satisfying user experiences, fostering strong relationships, and meeting diverse needs in the digital realm [23].

The expertise of reference librarians spans information retrieval, research techniques, digital literacy, and customer service skills, all of which are crucial for providing practical support in virtual reference services and contributing to the scholarly community's pursuit of high-quality research.

2.3. Librarian Responsiveness

Responsiveness refers to the promptness of a response [24]. It means how quickly a user receives a response to their question. It is one of the measures used to evaluate the quality of answers on Q&A sites and virtual reference services. Librarian responsiveness to user requests significantly impacts virtual reference service quality and user satisfaction. The effectiveness of virtual reference services and user satisfaction in academic libraries is positively influenced by the responsiveness of librarians [25].

Additionally, ethical considerations play a crucial role in reference practice, as librarians' valuations can affect the quality of virtual reference service and the user's perception of the library [26]. Virtual reference service evaluations have shown that librarians are achieving higher levels of correct and complete transactions in answering requests, indicating the importance of librarian responsiveness [27]. Moreover, user satisfaction with librarian-mediated search services is notably enhanced when librarians follow up, emphasizing the positive impact of librarian responsiveness on user satisfaction [28].

Six indicators for librarian responsiveness include timeliness of response, frequency of communication, availability, clarity of responses, responsiveness to user needs, and proactive assistance. Timeliness of response assesses the ability of virtual reference services to respond to user inquiries within a specified time interval. It emphasizes the importance of the speed and consistency of response times [29]. Communication frequency measures how often users engage with the virtual reference service, indicating the level of interaction. It includes various channels such as emails, phone calls, online conferencing, text messaging, social media, and collaboration tools [30], [31]. Availability refers to the extent to which reference services, including resources, technology, and staff, are accessible to library users. It encompasses physical and digital resources, ensuring users have the necessary support to meet their information needs [32].

Clarity of responses focuses on the quality of responses, emphasizing the importance of being transparent, understandable, and unambiguous. Clear communication is essential for users to comprehend information effectively and efficiently [13]. Responsiveness to user needs highlights the

importance of understanding and addressing library patrons' specific requirements and expectations [33]. Meeting user needs, including reference, IT, and circulation assistance, contributes to the overall responsiveness of virtual reference services [34]. Proactive assistance involves anticipating and addressing user needs before explicit requests [35], including offering support in locating resources, providing guidance on database usage, and offering assistance without waiting for users to seek help [36].

Collectively, these indicators contribute to the responsiveness of virtual reference services. A responsive service ensures timely, straightforward, proactive assistance that aligns with user needs. Evaluating and improving performance in these areas can enhance the overall quality of virtual reference services, leading to a more positive user experience and adequate support for library patrons.

2.4. Communication Channels

Communication channels are the diverse means and platforms cities and local governments employ to engage with the public [37]. These channels encompass traditional avenues like print media, television, public events, and digital platforms like social media and websites. Communication channels in the context of individual interactions include several methods or platforms utilized for communication, including face-to-face interactions, video calls, computer chats, email, text messaging, and phone calls [38].

The choice of communication channels significantly influences the quality of virtual reference services. Stevens [39] provides an overview of the benefits of new initiatives in revamping librarian and desk-centric services, shedding light on the potential advantages of utilizing different communication channels. Shachaf and Horowitz [27] discuss the accuracy of librarians' responses in virtual reference services, highlighting the need to consider the pros and cons of different communication channels to ensure service equality. The flexibility of librarians in offering references virtually anywhere suggests the potential advantages of diverse communication channels in reaching users [40]. Additionally, recent changes in reference services and the impact of the COVID-19 pandemic highlight the need for effective communication channels to maintain service quality during challenging circumstances [41].

On the other hand, evaluating and comparing the level of adherence to professional guidelines in virtual reference services indicates the need to consider the appropriateness of communication channels in meeting these guidelines [42].

Furthermore, further study is needed to determine if the results related to reference inquiries received through different channels are consistent throughout various university libraries [43]. These studies demonstrate the multifaceted influence of communication channels on reference service quality, encompassing aspects of flexibility, adherence to guidelines, and the impact of external factors.

Most previous studies have found that librarian expertise, responsiveness, and communication channels significantly affect the quality of virtual reference services. However, many of these studies focused on the direct effect of the determinants. Nevertheless, the relationships of these variables are more complex than it looks. For instance, the level of librarian expertise may influence the effectiveness of communication channels, enhancing the quality of virtual reference service. Other factors, such as user expectations and technological constraints, could also impact the overall quality of virtual reference services. Understanding these intricate relationships is crucial for improving the design and delivery of such services.

This study explores the interplay between librarian expertise, responsiveness, and communication channels used in the quality of virtual reference services. More specifically, the objective was to examine the direct and indirect effects of the determinant on the dependent variables. The main question of this study was whether communication channels could play a role in the relationship between librarian expertise, responsiveness, and the quality of virtual reference services. Figure 1 depicts the conceptual framework of this study for exploring the variable relationships and testing several hypotheses.

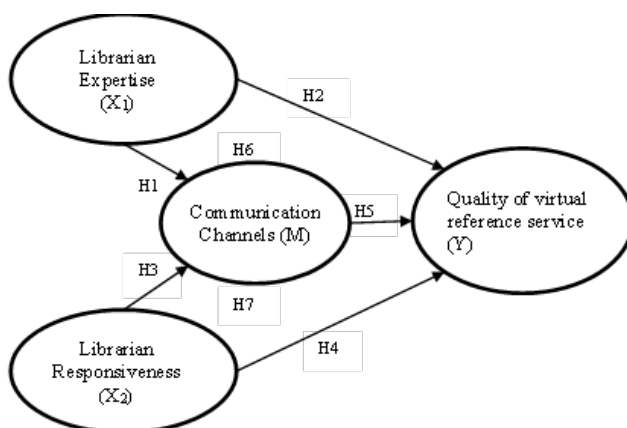


Figure 1. Conceptual framework of the study
Note. H = Hypothesis

3. Methodology

In this section, we offer a comprehensive overview of the research design, data collection methods, and analytical techniques utilized in the study examining the impact of librarian expertise, responsiveness, and communication channels on the quality of virtual reference services (VRS).

3.1. Study Design

This study is quantitative research with a correlational design [44], involving the collection and analysis of numerical data, allowing for statistical analysis and hypothesis testing. This method provides a systematic and structured approach to understanding phenomena and relationships between variables [45]. Correlational research examines the relationship between two or more variables without manipulating them. This non-experimental design is valuable in exploring associations and patterns in naturally occurring data [46]. Using correlational analysis, researchers can identify the strength and direction of relationships between variables, providing insights into potential predictive or explanatory patterns.

This investigation employed a set of questionnaires distributed using Google Forms to reach respondents faster and more efficiently. The questionnaires utilized a 5-point scale from 1 = very low or very rare to 5 = very high or very often to gauge respondents' perceptions of librarian expertise, responsiveness, communication channels, and the overall quality of virtual reference services.

3.2. Study Sample

The study involved 161 librarians from various state and private universities and institutions in Indonesia, including those in Java, Sulawesi, Sumatera, Bali, Nusa Tenggara Barat, and Kalimantan. The gender of respondents was 39.8% men and 60.2% women. In terms of age, the majority fell into the 40-49 years range (34.2%), followed by those above 49 years (33.5%). Regarding the length of work, 26.7% have been employed for less than six years, close to those working more than 20 years (26.1%). Their work ranks were predominantly middle-level (62.7%), with lower-ranking individuals comprising 9.3% and high-ranking individuals making up 28%. The dataset reflects a diverse educational background, with 49.1% holding bachelor's degrees and 38.5% possessing master's degrees. Regarding librarianship education, 52.8% of respondents had a bachelor's degree, while 23.6% held a master's degree.

3.3. Variable Measurements

All variables in this study were developed based on extant literature. Librarian expertise was measured using four components, including information retrieval skills [18], research techniques [20], digital literacy [21], and customer service skills [22]. In this study, each dimension used five items, totaling 20, and yield an Alpha of 0.972. Librarian responsiveness was measured using six dimensions, including timeliness of response [29], communication frequency [30], [31], availability [32], clarity of responses [13], responsiveness to user needs [33], and proactive assistance [35]. We also developed five questions for each dimension and gained an alpha of 0.982 for 30 items.

Communication channel was measured using three indicators, including communication channel usage [38] with five items, communication channel preference [39] with five items, and communication channel effectiveness [41] with five items, totaling 15 questions ($\alpha = 0.887$). Finally, the quality of virtual reference services was measured using six indicators, including promptness of response [10], accuracy of information provided [12], clarity of communication [13], professionalism [14], meeting user needs [15], and continuous improvement [16]. Each dimension was assessed using three questions, totaling 18 items ($\alpha = 0.975$).

3.4. Data Analysis

The collected questionnaire data underwent confirmatory factor analysis (CFA) through structural equation modelling (SEM) [47] with the assistance of Lisrel 8.8 [48]. The primary objective was to unravel the interrelationships among variables such as librarian expertise, responsiveness, communication channels, and the overall quality of virtual reference services. The CFA procedure was employed to assess the construct validity of measurement. Construct validity can be measured if the scale's factor structure is consistent with the measured instrument's constructs. In confirmatory factor analysis, the factor structure is explicitly hypothesized and tested with the covariance structure of the items. The study scrutinized various fit indices, such as chi-square, RMSEA, GFI, CFI, NFI, RMR, RFI, IFI, and PNFI. The internal consistency of the measurement scales was evaluated using Cronbach's alpha values.

4. Results

The study's primary results are presented and discussed in this section, considering the research questions.

The potential implications of these results for both theory and practice are also considered.

4.1. Structural Equation Model Test

Table 1 presents the findings of a structural equation model (SEM) examining the influence of reference librarians' expertise and responsiveness on the quality of virtual reference services via communication channels among 161 reference librarians in Indonesian universities. The p-value of 0.05 for the Chi-Square (χ^2) exceeds the conventional significance level of 0.05. While this suggests a marginal fit, it is essential to note that the chi-square test is sensitive to sample size, and other fit indices provide a more comprehensive assessment. The RMSEA (root mean square error of approximation) with a value of 0.046 falls below the recommended threshold of 0.05, indicating a good fit. The GFI (goodness of fit index) of 0.93 surpasses the acceptable threshold of 0.90, indicating a good fit. The CFI (comparative fit index) achieves a perfect fit with a value of 1.00, exceeding the recommended threshold of 0.95.

The NFI (normed fit index) of 0.99 indicates a perfect fit, surpassing the threshold of 0.95. The RMR (root mean square residual), with a value of 0.48, is below the acceptable threshold of 0.80, indicating a good fit. The RFI (relative fit index) of 0.98 suggests a high level of fit on a scale from 0 to 1. The IFI (incremental fit index) achieves a perfect fit with a value of 1.00, exceeding the recommended threshold of 0.90. Finally, the PNFI (parsimony normed fit index), with a value of 0.62, meets the threshold of 0.50, indicating an acceptable fit. The combination of fit indices, including chi-square, RMSEA, GFI, CFI, NFI, RMR, RFI, IFI, and PNFI, supports the adequacy of the model.

Table 1. Summary of fit indices

Aspects	Criteria	Scores	Status
Chi-Square	$P \geq 0.05$	0.05	Fit
RMSEA	< 0.05	0.05	Fit
GFI	> 0.90	0.93	Fit
CFI	> 0.95	1.00	Fit
NFI	> 0.95	0.99	Fit
RMR	< 0.80	0.48	Fit
RFI	0 - 1	0.98	Fit
IFI	> 0.90	1.00	Fit
PNFI	> 0.50	0.62	Fit

4.2. Results of Hypothesis Testing

Table 2 shows the hypothesis testing results for each exogenous variable's direct and indirect effects on the endogenous variable through the mediator variable.

Librarian expertise (X1) significantly influences communication channels (M) with a positive path coefficient of 0.210 ($t = 2.140, p = 0.030$). Librarians with high expertise use available communication channels to provide reference services virtually. Similarly, a positive relationship between librarian expertise (X1) and the quality of VRS (Y) was substantiated with a path coefficient of 0.220 and a highly significant t-value of 2.270 ($p = 0.000$). This finding suggests that the more expert the librarians are, the more likely they are to provide higher-quality reference service.

Librarian responsiveness (X2) was also a significant driver of communication channels (M), with a path coefficient of 0.590 ($t = 5.250, p = 0.000$). Librarians with a high attitude toward responding to the users will attempt to use various communication channels. However, the relationship between librarian responsiveness (X2) and the Quality of VRS (Y) was not significant (t-value of 0.710, $p = 0.061$).

Table 2. Path coefficient of direct and indirect effects

Hypotheses	Path	Std. coefficient	t	p	Decision
H1	X1→M	0.210	2.140	0.030	Accepted
H2	X1→Y	0.220	2.270	0.000	Accepted
H3	X2→M	0.590	5.250	0.000	Accepted
H4	X2→Y	0.110	0.710	0.061	Rejected
H5	M→Y	0.470	2.550	0.000	Accepted
H6	X1→M→Y	0.340	3.589	0.000	Accepted
H7	X2→M→Y	0.240	3.200	0.001	Accepted

Note. The t-value of accepted hypotheses is > 1.96 ; X1 = Librarian Expertise, X2 = Librarian Responsiveness, M = Communication Channels, and Y = Quality of Virtual Reference Service

Communication channels (M) itself emerged as a critical determinant of VRS quality (Y), with a positive path coefficient of 0.470 and a highly significant t-value of 2.550 ($p = 0.000$). Librarians using various communication channels results in the quality of servicing references virtually. Furthermore, communication channels (M) also significantly mediate the effects of librarian expertise (X1) and responsiveness (X2) on VRS quality (Y), yielding significant positive relationships ($t = 3.589, p = 0.000$ and $t = 3.200, p = 0.001$, respectively). The expert librarians will use available and diverse communication channels to improve their virtual reference service. Similarly, the responsive librarians to users will use diverse communication channels, making their service more quality.

5. Discussion

This section discusses the main results derived from the statistical analyses, and the potential implications of these findings are suggested.

5.1. Effects of Librarian Expertise and Responsiveness on Communication Channels

Librarian expertise and responsiveness are two critical factors that directly affect communication channels, especially in the context of virtual reference services in academic libraries. Responsiveness, in this context, refers to the speed and efficiency of library staff or systems in responding to user queries. A high level of responsiveness can significantly increase user satisfaction and engagement. For example, using AI-based chatbots such as Google Bard, which leverages natural language processing and machine learning, can provide dynamic conversational interactions and context-relevant responses, enriching library experiences [49]. However, the effect of responsiveness is higher than expertise on communication channels as users often expect an immediate response in the digital age. Technology such as live chat portals and text messaging services can help meet these expectations, providing instant responses to user queries [50].

Expertise refers to the depth of knowledge and skills that library staff possesses. While expertise is essential, its impact on communication channels may be less direct than responsiveness. For example, a study of virtual reference services in academic libraries in Pakistan found a positive correlation between the use of web search engines and the quality of digital reference services provided to library users [51]. This finding suggests that library professionals' expertise in using these tools can improve the quality of service.

However, the same study also found that the Internet has made the work of reference services more challenging and demanding, requiring appropriate training for relevant staff [51]. This finding highlights the importance of continuous professional development to ensure library staff maintain a high level of expertise in the face of rapidly evolving technology.

In addition, the role of student workers in providing virtual reference support has evolved, raising concerns about service quality and highlighting the importance of adequate training and evaluation for these employees [52]. While expertise is essential, it must be accompanied by adequate training and assessment programs to ensure high standards of service quality.

5.2. Effects of Librarian Expertise and Responsiveness on VRS Quality

The expertise of reference librarians is critical to the quality of VRS because it directly affects their ability to provide users with accurate, relevant, and in-depth information.

Expertise in this context refers to the librarian's knowledge of the subject matter, sources of information, search strategies, and the ability to interpret information needs accurately. This expertise ensures that users receive high-quality assistance tailored to their questions, especially in virtual environments where users rely on librarian skills to navigate digital resources effectively [51].

On the other hand, responsiveness, while important, may not have the same direct impact on the perceived quality of VRS. Responsiveness refers to the speed and willingness of librarians to answer user questions. While timely responses are valued, they do not always equate to delivering high-quality information. If a librarian responds quickly but fails to provide proper or accurate information, the user's needs are unmet, and the service is not considered high quality [52].

In the virtual environment of VRS, the importance of providing accurate and relevant information is accentuated by the impersonal nature of interactions, intensifying user expectations [53]. The absence of physical cues heightens the significance of the substantive content of librarian assistance in VRS, which is crucial for ensuring user satisfaction [53]. Another study demonstrates that high levels of trust among participants, experts, and novices play a critical role in the accuracy of information provided [54]. Furthermore, maintaining information accuracy, especially in cybersecurity contexts, is critical, adding complexity to information dissemination [53].

It is equally essential to assess library service quality to align user perceptions and expectations, emphasizing the necessity for accurate and relevant information [55]. In addition, drug information in Google snippets shows a practical example of the critical role of information accuracy in a virtual setting [56]. These findings suggest that accuracy and completeness of information are pivotal for user satisfaction in virtual reference services. Moreover, discussing the impact of information accuracy on network performance suggests a nuanced relationship between accuracy and system performance [57]. This observation is particularly relevant in virtual environments where user satisfaction is intricately tied to information system performance [53], [54], [55].

5.3. Communication Channels Mediate the Effect of Librarian Expertise and Responsiveness on VRS Quality

Communication channels significantly mediate the effects of librarian expertise and responsiveness on VRS quality, suggesting that the choice and utilization of communication tools play a crucial role in shaping the overall effectiveness of virtual

reference service. This mediation effect underscores the importance of aligning librarian skills and responsiveness with appropriate communication channels to enhance the quality of the service.

Research has highlighted the integral role of communication channels in virtual reference services [58]. Effective communication is not only about the content of the interaction but also about the mode through which it is delivered [59]. The selection of appropriate communication channels depends on factors such as the nature of the query, user preferences, and the capabilities of the librarians. Librarian expertise becomes essential in this context, as skilled librarians can navigate diverse communication channels effectively, tailoring their responses to users' unique needs [60].

Communication channels are particularly relevant to responsiveness in virtual reference services [1]. Responsiveness is essential for providing timely and helpful assistance to users, and the choice of communication channel influences the speed and effectiveness of these responses. A responsive librarian utilizing an appropriate communication channel can contribute significantly to user satisfaction and the overall quality of the service [49].

Moreover, integrating librarian expertise with communication channels aligns with the concept of information intermediaries, bridging the gap between users and information resources. Skilled librarians can leverage communication channels to facilitate access to relevant information, guide users in their research, and address queries promptly [53].

Understanding the mediation effect of communication channels on the relationship between librarian expertise, responsiveness, and VRS quality provides practical insights for optimizing virtual reference services. Librarians and service providers can benefit from a strategic alignment of expertise, responsiveness, and communication channels to enhance the overall user experience and satisfaction in virtual reference interactions.

6. Conclusion

The interplay between librarian expertise, responsiveness, and communication channels can gauge the quality of VRS in academic libraries. Responsiveness, defined by the prompt and efficient handling of user queries, significantly influences user satisfaction in an era dominated by instant expectations. While undeniably important, the impact of librarian responsiveness on the use of communication channels is nuanced, as timely responses do not guarantee the delivery of high-quality information.

Librarian expertise, encompassing knowledge, search strategies, and accurate interpretation of information needs, plays a pivotal role in shaping the quality of VRS. This expertise ensures the provision of accurate, relevant, and in-depth information to users, emphasizing its direct impact on service quality.

Communication channels, recognized as a crucial factor, are not only content-dependent but also influenced by the mode of delivery. Librarian expertise proves instrumental in navigating diverse communication channels and tailoring responses to meet unique user needs. The mediation effect of communication channels, particularly on librarian responsiveness, further contributes to the quality of VRS. This integrated approach aligns with the concept of information intermediaries, emphasizing the role of skilled librarians in promptly facilitating access to relevant information. Understanding these dynamics provides practical insights for optimizing virtual reference services, encouraging a strategic alignment of expertise, responsiveness, and communication channels to enhance user experience and satisfaction in virtual reference interactions.

7. Limitations of the Study

This study holds some limitations. Virtual reference service applications in Indonesian libraries are emerging, making librarians less informed about the VRS. Thus, their self-evaluation of the VRS provision may be mixed with their understanding of typical reference services. Additionally, the lack of standardization in VRS practices may further complicate librarians' assessment of their services. Furthermore, our respondents came from diverse university backgrounds in terms of status (state and private), size (small, medium, and large), and locations (cities and towns), making their responses to the questionnaires biased.

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