

Evaluation Model for User Engagement Level in University Library Subject Services: From the Perspective of High-Quality User Engagement (Postprint)

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Abstract

[Purpose/Significance] Harnessing user wisdom to compensate for librarians' knowledge limitations represents a significant trend in the transformation and development of university library subject services in the new era. Evaluating user participation quality provides theoretical reference for libraries to better integrate user wisdom. [Method/Process] Employing a mixed-methods approach combining qualitative and quantitative methods, a conceptual model was constructed from three main dimensions—“psychological proximity,” “action support,” and “result performance”—and measurement items were selected and refined. Through exploratory and confirmatory analyses, a guidance and evaluation model for high-quality user participation in university library subject services was established. [Results/Conclusion] The evaluation model for library subject services can be presented as a multi-level, multi-dimensional comprehensive evaluation model comprising three main dimensions and eight sub-dimensions.

Full Text

An Evaluation Model for User Participation Level in University Library Subject Services: From the Perspective of High-Quality User Participation

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Abstract:

[**Purpose/Significance**] Integrating user wisdom to compensate for librarians' knowledge limitations represents an important trend in the transformation and development of university library subject services in the new era. Evaluating the quality of user participation provides theoretical references for libraries to better integrate user wisdom. [**Method/Process**] Using a combination of qualitative and quantitative methods, this study constructs a conceptual model from three main dimensions—“psychological approach,” “action support,” and “result performance”—and screens and optimizes evaluation items. Through exploratory and confirmatory analysis, a guidance and evaluation model for high-quality user participation in university library subject services is established. [**Result/Conclusion**] The evaluation model for library subject services can be presented as a multi-level, multi-dimensional comprehensive evaluation model comprising three main dimensions and eight sub-dimensions.

Keywords: university library; subject service; high-quality participation; evaluation model

2. Screening of Evaluation Items for High-Quality User Participation in Library Subject Services

2.1 Main Dimensions for Evaluating High-Quality User Participation in Library Subject Services

2.1.1 Classification and Summary of Traditional User Participation Dimensions User participation originates from the concept of “customer participation” in service marketing. Early scholars such as R. B. Chase used “involvement level” to interpret user participation, while C. T. Ennew and M. R. Binks divided user involvement behaviors into information sharing, responsible behavior, and interpersonal interaction. T. W. Gruen et al. and P. K. Mills et al. focused on using “input quality” to describe user participation, specifically dividing it into three dimensions: physical input (tangible resources, physical labor, etc.), intellectual input (users' knowledge and wisdom contribution), and emotional input (patience and attitude during participation). P. Patterson et al. and L. H. Bowdlen et al. used “psychological state” to interpret user participation, with V. H. Vroom and A. G. Jago further refining this psychological feeling into aspects such as identification, trust, and belonging. Despite certain differences in details, these studies generally classify user participation dimensions into two perspectives: behavioral-level tangible and intangible physical labor outcomes, and psychological-level cognitive and emotional factors. This dimensional classification provides a theoretical foundation for guiding and constructing the main evaluation dimensions for high-quality user participation in library subject services.

2.1.2 Characteristics of User Participation in Library Subject Services and Selection of Main Evaluation Dimensions

Subject services are a user-demand-centered service model that organically integrates into users' teaching, research, and information literacy enhancement processes to provide more comprehensive knowledge content with disciplinary characteristics. Compared with profit-oriented services in service marketing, user participation in library subject services has unique public welfare characteristics, making it unreasonable to directly apply evaluation indicators from service marketing. When the subject librarian system was initially established in Chinese university libraries, Jiang Airong proposed recommendations for proactive service development. In 2005, Hu Changping proposed a diversified and integrated sustainable development strategy for subject services, emphasizing user-oriented resource integration and service platform construction. Web 2.0 technology, which enables users to freely publish and manage information, has promoted the transformation of subject services from traditional library-led to user-led models. However, whether in librarian-led or user participation models, interaction remains a core characteristic. Therefore, explorations in library subject services have focused on supporting platforms (such as LibGuides and virtual communities), providing resources and tools for user participation in content creation, and guiding and motivating user participation. Overall, high-quality user participation in subject services includes not only user inputs such as time, energy, knowledge, and emotion, but also conditional support created by libraries to enhance participation quality.

According to A. Bandura's social cognitive theory, users' self-confidence in their abilities is also important. Individuals with strong self-efficacy are willing to exert greater effort even when facing difficult tasks. A. Cabrera's research shows that self-efficacy can enhance cooperation willingness and promote knowledge sharing. Additionally, T. Dinev et al. found that users' participation willingness is significantly influenced by the degree of privacy protection. In library services, trust is indispensable for users to contribute their knowledge. Zhou Tao et al.'s research on virtual communities revealed that users' privacy concerns significantly affect their behavior and trust levels. Based on these factors, we propose that psychological approach can be observed from motivation, security perception, and self-efficacy, with observation items designed from the user perception perspective, as shown in .

Observation Items for "Psychological Approach"

Based on the above analysis, we believe that when guiding and measuring high-quality user participation in library subject services, in addition to considering users' psychological feelings and behavioral performance, we should also focus on actions taken by libraries to promote user participation. Drawing on the dimensional classification of user participation in service marketing and combining it with practical characteristics of user participation in library subject services, we propose observing high-quality user participation from three aspects: (1) psychological approach—users' psychological perception during participation;

(2) action support—conditions created by libraries to attract user participation; and (3) result performance—users’ specific behavioral manifestations during participation.

2.2 Analysis of Observation Content for High-Quality User Participation in Library Subject Services

2.2.1 Analysis of Observation Content for Psychological Approach

User participation in library subject services is not merely selfless contribution of resources or knowledge; users also aim to obtain desired value. From this perspective, the process can be understood as one of demand satisfaction. When users hope to achieve certain goals or meet expectations through participation, psychological drivers such as knowledge acquisition motivation, social motivation, and reputation motivation positively promote participation behavior. Based on these considerations, we preliminarily propose that psychological approach can be observed from motivation, security perception, and self-efficacy, with observation items designed from the user perception perspective, as shown in .

2.2.2 Analysis of Observation Content for Action Support

As previously mentioned, library service platforms and service guarantees affect high-quality user participation. During subject service processes, high-quality user participation relies on platform support. Li Yuelin et al. empirically studied user-digital library interaction performance from information, technology, and task dimensions, finding that interface usability, information adequacy, and user confidence significantly affect interaction. Zhao Yang’ s research on digital library services confirmed that platform factors influence user participation. Beyond platforms, participation atmosphere and interaction guidance also matter. Li Jiang et al. found that creating a good participation atmosphere promotes the transformation of users’ tacit knowledge, while active publicity helps form a strong participation atmosphere. During user participation, librarians’ guidance ensures smooth communication channels, and clear participation rules provide strong support for high-quality guidance and standardized participation, maintaining the normal operation of user participation mechanisms. Therefore, we preliminarily propose that “action support” can be observed from resources support and interaction support provided by libraries, with observation items designed from the user perspective, as shown in .

Observation Items for “Action Support”

2.2.3 Analysis of Observation Content for Result Performance

L. A. Bettencourt divided user participation results into loyalty, cooperation, and information sharing. Zou Wei categorized library user participation results into cooperation, suggestions, and relationship behaviors. L. Shu et al. listed participation frequency and depth as characteristics of online brand community user participation. Qi Xianghua’s research shows that good library-user relationships

are closely related to enhanced user identification and belonging. Libraries involve users in subject services to leverage their strengths in solving professional problems beyond librarians' capabilities, while users' proactivity and seriousness may also affect final participation quality. Therefore, we preliminarily propose that "result performance" can be observed from proactivity, interactivity, and relationship viscosity. Although "result performance" can be observed from both user and library perspectives, given the current primary level of user participation, evaluation from the user perception perspective is more feasible. Thus, we developed 10 observation items from the user perspective, which can be supplemented from the library perspective in the future with evaluation tool support, as shown in .

Observation Items for "Result Performance"

2.3 Screening of Main Dimension Evaluation Items for High-Quality User Participation in Library Subject Services

Based on the initially selected 3 main dimensions and 25 evaluation items, the research team consulted one professor specializing in library subject services and two librarians with extensive subject service experience at Nanjing universities. Through in-depth discussions, consensus modifications were reached as shown in .

Expert Consultation Opinions

Based on the expert opinions in , a 29-item evaluation scale was developed, as shown in .

Main Dimension Evaluation Scale for High-Quality User Participation in Library Subject Services

3. Exploratory Analysis of the Evaluation Model for High-Quality User Participation in Library Subject Services

3.1 Data Source and Sample Characteristics

Based on the evaluation scale in , a survey was conducted using a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). To enhance applicability, the survey targeted users of different types of university libraries. Questionnaires were distributed from February to March 2021 via WeChat, QQ, email, and on-site collection. A total of 1,252 questionnaires were collected, with 906 valid questionnaires after excluding incomplete and straight-line responses, yielding a 72.36% valid response rate. The 906 valid questionnaires were divided into two equal parts: 453 for exploratory analysis and 453 for confirmatory analysis. Sample characteristics are shown in .

Sample Characteristics

3.2 Exploratory Analysis of the Evaluation Scale

Given that the main dimensions in were fully validated by experts, SPSS 22.0 was used for exploratory factor analysis of sub-dimensions using the exploratory sample. Two rounds of analysis were conducted. The first round examined all 29 items, with Cronbach' s alpha and KMO values meeting standards, as shown in . Three factors were extracted for each main dimension, but item P5 in “result performance” showed cross-loadings (0.412 and 0.532), requiring deletion. Follow-up communication with library users indicated that P5 was not directly related to “high-quality participation” and could be removed.

The second round of analysis was conducted on the remaining 28 items. All main dimensions and the overall scale showed Cronbach' s alpha above 0.8, indicating high reliability. KMO values exceeded 0.8, and Bartlett' s test significance was 0.000, indicating good validity for exploratory factor analysis. Reliability and validity metrics for both rounds are shown in .

Based on the second analysis, “psychological approach,” “action support,” and “result performance” yielded 3, 2, and 3 factors as sub-dimensions respectively, with cumulative variance explained at 73.815%, 71.615%, and 74.653%. Factor loadings are shown in . These results produced a multi-dimensional, multi-level evaluation model for high-quality user participation in library subject services, illustrated in [Figure 1: see original paper]. Items were renumbered across 3 main dimensions and 8 sub-dimensions, as summarized in .

Reliability and Validity Tests for Two Rounds of Exploratory Analysis

Rotated Component Matrix Results for Three Dimensions

[Figure 1: see original paper] Evaluation Model for High-Quality User Participation in Library Subject Services

Evaluation Scale for High-Quality User Participation in Library Subject Services

3.3 Confirmatory Analysis of the Evaluation Model for High-Quality User Participation in Library Subject Services

As shown in , the evaluation model is a multi-dimensional, multi-level structure where main dimensions interact and jointly affect users' quality perception of participation. Following M. K. Brady and J. J. Cronin' s view that no highly effective method exists for simultaneously validating three-level factor models, this study used the “partial disaggregation technique” for staged, hierarchical validation of the model in [Figure 1: see original paper] using confirmatory sample data and AMOS 26.0.

The first stage validated the three main dimensions as appropriate indicators. The second stage validated whether the eight sub-dimensions were appropriate indicators. The third stage validated whether high-quality participation could serve as a higher-level factor for the three main dimensions. Following previous research, “psychological approach,” “action support,” and “result performance”

were treated as equal dimensions, with items randomly combined according to measurement principles. The validation results are shown in [Figure 2: see original paper], where (a) shows the first-stage model, (b) the second-stage model, and (c) the third-stage model. Factor loadings between observed variables and main dimensions ranged from 0.92 to 0.98, and between observed variables and sub-dimensions from 0.75 to 0.94, demonstrating good convergent validity. Coefficients between main dimensions and between main dimensions and high-quality participation were all less than 1, indicating good discriminant validity. Fit indices for the three stages are shown in , demonstrating good model fit.

[Figure 2: see original paper] Hierarchical Validation Results of the Multi-Dimensional Evaluation Model

Model Fit Indices for Each Stage

Based on these results, the three-level, multi-dimensional evaluation model for high-quality user participation in library subject services is validated. High-quality participation comprises three main dimensions: “psychological approach,” “action support,” and “result performance.” “Psychological approach” consists of three sub-dimensions: “benefit perception,” “security perception,” and “tendency perception.” “Action support” comprises two sub-dimensions: “convenience” and “interactivity.” “Result performance” consists of three sub-dimensions: “involvement,” “proactivity,” and “harmony.” Users can evaluate high-quality participation based on these three main dimensions, which serve as shared variance for the higher-order factor.

User participation is a crucial force driving the transformation of library subject services. Participation quality is a key indicator for measuring user involvement, and promoting users to contribute wisdom for co-creating service value represents an exploration direction for deepening service levels. Since user behavior results from multiple factors including cognition, emotion, and experience, evaluating high-quality participation requires systematic consideration. Combining practical characteristics of user participation in library subject services, this study designed evaluation indicators primarily from the user perception perspective while reserving space for future library-perspective observations, enhancing scientific rigor and promoting participation quality improvement. Limitations include the theoretical nature of the model and limited expert consultation. Although the indicator framework received positive feedback from 12 “Double First-Class” university libraries in Nanjing in January 2022, further practical refinement is needed. Future research will focus on improving factors influencing high-quality participation and conducting empirical guidance and evaluation using the established indicators.

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Li Yang: Paper revision

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