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Gender differences in information and communication technology competencies among librarians in Indonesia

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ABSTRACT

This study evaluates the Information and Communication Technology (ICT) competency frameworks for librarians in Indonesia, focusing on gender differences. Despite the critical role of these frameworks in addressing digital age challenges, their efficacy in capturing gender-specific nuances in competencies is underexplored. This research surveyed 208 librarians, employing a questionnaire derived from the 2019 Indonesian National Qualifications Framework for Libraries (SKKNI). The survey, distributed via Google Forms, targeted librarians in various library types across Indonesia. Employing accidental random sampling, this research revealed significant disparities in ICT-related competencies across genders. While gender did not majorly influence the demographic characteristics of librarians in the ICT division, notable differences emerged in ICT competency based on gender. These findings highlight the need for gender-sensitive approaches in developing ICT competencies and suggest revisions to current frameworks to address gender-specific needs better, contributing to a deeper understanding of digital literacy and equity in Indonesian librarianship.

ABSTRAK

Penelitian ini mengevaluasi kerangka kompetensi Teknologi Informasi dan Komunikasi (TIK) untuk pustakawan di Indonesia dengan fokus pada perbedaan gender. Meskipun kerangka ini penting dalam menghadapi tantangan era digital, efektivitasnya dalam menangkap nuansa spesifik gender dalam kompetensi belum banyak diteliti. Peneliti melakukan survei terhadap 208 pustakawan dengan menggunakan kuesioner yang berasal dari Standar Kompetensi Kerja Nasional Indonesia (SKKNI) 2019 untuk Perpustakaan. Survei ini, yang disebar melalui Google Forms, menargetkan pustakawan dari berbagai jenis perpustakaan di Indonesia. Menggunakan sampling acak, penelitian ini mengungkapkan perbedaan yang signifikan dalam kompetensi TIK berdasarkan gender. Meskipun gender tidak terlalu mempengaruhi karakteristik demografis pustakawan di divisi TIK, perbedaan yang mencolok muncul dalam kompetensi TIK berdasarkan gender. Temuan ini menyoroti perlunya pendekatan sensitif gender dalam mengembangkan kompetensi TIK dan menyarankan revisi pada kerangka kerja saat ini untuk lebih mengakomodasi kebutuhan spesifik gender, berkontribusi pada pemahaman yang lebih dalam tentang literasi digital dan kesetaraan dalam kepustakawanan di Indonesia.

Keywords: Librarian competencies, Information and communication technologies, ICT competencies, Gender gap, digital literacy

1. INTRODUCTION

Competencies in information and communication technology (ICT) are pivotal for librarians. Accordingly, assessing ICT-related competencies is essential to discern their influence on the domain of library and information science (LIS) (Qudussisara, 2017; Siregar, 2016). Previous studies, such as Singh et al. (2020), have scrutinized ICT competencies within traditionally gender-segregated professions, noting the prevalence of women in librarianship as portrayed on digital media platforms. Unlike prior studies, this research uniquely examines the influence of the Indonesian National Qualifications Framework (SKKNI) on gender-specific ICT competencies among librarians, a

perspective not previously explored in the LIS field. While previous studies like those by Singh et al. (2020) and Ahmed and Sheikh (2021) have examined aspects of ICT competencies, there is limited empirical evidence specifically addressing the correlation between gender and national competency standards in ICT within library environments. This gap is particularly evident in the context of Indonesian librarians, where such correlations have not been quantitatively analyzed. This paper pioneers an investigation into this association among librarians in Indonesia.

Our analysis draws upon a critical function from the 2019 Indonesian National Qualifications Framework for Libraries (SKKNI)—the application of ICT. This ICT competency encompasses two variables with 44 indicators, forming the basis of our survey questions. Given the uncharted impact of SKKNI on ICT competencies within the LIS field, Indonesia serves as the research locus. This contrasts with existing studies in other sectors, such as transportation (Simanjuntak et al., 2019) and occupational safety (Lumempow et al., 2018).

This research aims to unravel the dynamics between gender and ICT competencies among librarians. It seeks to 1) assess whether gender disparities among librarians manifest in demographic attributes, including age, highest education attained, study program, library type, and length of service; and 2) evaluate the potential association between gender and librarians' self-perceptions of their ICT competencies, as delineated by the 44 SKKNI indicators. The outcomes of this study promise to offer an empirical foundation for the formulation of a tailored LIS curriculum that aligns with the professional requirements of Indonesian librarians, resonating with recommendations by Mo et al. (2019).

2. LITERATURE REVIEW

2.1 Stereotypes of Gender in ICT Competencies

Women often do not get the same opportunities in education, economy, and societal positions as men. Women frequently face disparities in accessing educational, economic, and societal opportunities compared to men. This imbalance significantly hinders progress towards the Sustainable Development Goals, particularly in achieving gender equality. In response, various programs have been initiated to enhance ICT competencies among women, recognizing the role of technology in empowering women (Koehler, 2016). The International Monetary Fund's report, "Gender, Technology, and the Future of Work" (Brussevich et al., 2018), underscores the urgency of this issue. The report reveals that in 30 countries, approximately 26 million female workers are at an elevated risk of job displacement due to automation, a risk that is 11% higher than that of their male counterparts. This heightened vulnerability is largely attributed to the limited educational opportunities available to women. Women in these regions are predominantly employed in low-skill occupations, such as clerical, service, and sales. This trend is evident in tourism (Kim et al., 2019) and maritime industries (Tussyadiah, 2020). Furthermore, the global pandemic has exacerbated these challenges, intensifying the impact on women's employment and economic stability (Krukowski et al., 2021; MacLeavy, 2021).

The long-standing stereotype that specific jobs are predominantly male-dominated has been a subject of considerable debate and concern. This issue is influenced by various factors, including the significance of organizational culture and societal norms, specific tasks and processes related to particular jobs, and the structural and interactional factors contributing to gender discrimination. For instance, some professions are perceived as more masculine and are thus predominantly occupied by men, leading to gender imbalances in these fields. A notable example is the stereotype that office administrative roles, often deemed to require lower skill levels, are typically assigned to women. In contrast, jobs necessitating higher skill levels, such as those in information technology (IT),

are more frequently allocated to men. Research indicates that this disparity is partly due to fewer women choosing to study and work in IT fields, impacting gender inequality in these professions. Factors such as career prospects and job satisfaction are significant in this context (Rogers, 2015). The 2022 Global Gender Gap Report reveals that the gender gap is particularly pronounced in ICT, Engineering, and Manufacturing. Among graduates in all fields, only 1.7% of female graduates specialize in ICT, compared to 8.2% of male graduates. Indonesia's Economic Participation and Opportunity score stands at 0.674, highlighting a considerable gender gap (Hausmann et al., 2022).

The involvement of women in the design and development of information technology at every stage is crucial to address the significant shortfall in human capital and to shape the future of an increasingly information-centric society. Data from previous studies underscore the extent and implications of gender segregation in IT jobs. These findings are pivotal for benchmarking the relationship between demographic characteristics and librarians' IT competencies in the current study, offering a comparative perspective on how gender dynamics influence professional competencies in the IT sector.

2.2 Librarians' ICT Competencies

The librarian profession has historically been predominantly associated with women and often perceived as a feminine domain (Arrosagaray et al., 2019). This perception is deeply rooted in the traditional view that library work primarily involves administrative tasks such as book data collection, classification, and cataloging. However, the rapid advancement of information technology and the widespread use of the internet have necessitated a significant evolution in the librarian's role. Today's librarians are required to develop a diverse range of soft and hard skills to manage information service tasks effectively. This skill set encompasses proficiency in various tools and applications, including but not limited to word and number processing software, library automation systems, adherence to bibliographic standards, management of institutional repositories, operation of digital libraries, usage of plagiarism detection tools, multimedia editing applications, cloud computing, and leveraging Web 2.0 platforms. These technological advancements have not only broadened the scope of librarians' competencies but have also catalyzed a shift in the perception and culture of the librarian profession, reflecting a more dynamic and technology-oriented image (Bajpai & Madhusudhan, 2019; Shaw, 2019). This transformation underscores the increasing importance of communication and information technology skills in the library sector, aligning the profession with the contemporary digital landscape.

Tyagi et al. (2018) formulated a comprehensive ICT competency framework for information professionals. This framework is structured around three core components: fundamental technology knowledge, functional aptitude and capabilities, and expertise in conceptual applications. Complementing this framework, Shahbazi and Hedayati (2016) emphasized the critical role of communication, teamwork, and problem-solving skills. These competencies are the top three essential skills for digital librarians to harness and maximize ICT in their professional activities effectively.

Recognizing the need for standardized librarian competencies in ICT, several organizations have developed frameworks to address the unique challenges presented by the digital world. Notable among these is the CILIP Developing Professional Knowledge and Skills Base (2021), which provides a comprehensive guide for librarians to develop and enhance their ICT skills. Additionally, the International Federation of Library Associations and Institutions (IFLA) has contributed significantly with its Libraries in Digital Skills Policies (2020), further reinforcing the importance of ICT competencies in modern libraries. Collectively, these frameworks aim to equip librarians with the necessary skills and knowledge to thrive in an increasingly digital and information-centric world, ensuring their roles evolve with technological advancements.

The Indonesian government has established a regulatory framework to advance professional qualifications within the country. This initiative includes issuing a presidential regulation concerning the Indonesian National Qualifications Framework (SKKNI), tailored explicitly for libraries, as outlined by Qudussisara (2017). The SKKNI framework serves as a comprehensive system for categorizing and equating competency qualifications. It meticulously integrates educational achievements, job training, and work experience across a broad spectrum of professional levels, ranging from level 1–3 operators to level 4–6 technicians or analysts and extending to level 7–9 experts in various sectors.

Within this framework, the SKKNI identifies a total of 44 competencies. Focusing on the library sector, it distinguishes two primary dimensions of ICT capabilities: firstly, the development of ICT-based library information systems, and secondly, the application of communication information technology within library settings. Despite these established frameworks, the field of gender studies concerning ICT competencies is still evolving, indicating a substantial need for ongoing research (Carson & Little, 2014; Singh et al., 2020). Consequently, this study aims to explore the intersection of gender and ICT competencies within librarianship, exploring how gender dynamics can influence and inform the development of ICT skills in this field. This exploration is crucial for understanding the broader implications of gender in the evolving landscape of library science and information technology.

Despite the extensive frameworks and studies on ICT competencies in librarianship, notably in the SKKNI context, there is a notable gap in literature specifically focusing on gender-related aspects within these competencies. Previous research has predominantly concentrated on the general development of ICT skills without delving into the nuanced differences that may arise due to gender. This oversight presents a critical area for exploration and understanding, particularly given the evolving role of gender in professional environments. Therefore, this study seeks to fill this gap by providing an in-depth analysis of gender differences in ICT competencies among librarians in Indonesia. This approach contributes to the existing body of knowledge and underscores the need for a more inclusive and comprehensive understanding of professional competencies in the digital age.

3. METHODS

3.1 Data Collection

This research is integrated into a broader librarianship training needs analysis conducted by the Education and Training Center of the National Library of the Republic of Indonesia. The primary instrument for data collection was a meticulously designed questionnaire based on the Indonesian National Qualifications Framework for Libraries (SKKNI) established in 2019. This framework outlines seven essential functions to gauge librarians' competencies in Indonesia, particularly emphasizing the application of information and communication technology (ICT). Within this domain, we identified 44 distinct competency indicators, forming the basis of our questionnaire. The responses were quantified using a 5-point Likert scale, ranging from 1 (very poor) to 5 (excellent), allowing participants to self-assess their proficiency across each indicator.

3.2 Data Distribution and Response

For effective distribution, the questionnaire was accessible online via Google Forms from July 22 to September 17, 2020. The target demographic comprised individuals employed in ICT positions across a diverse range of library settings in Indonesia, including public, special, national, and academic libraries. The distribution strategy was multifaceted, utilizing various channels such as direct mailings, email campaigns, and social media platforms to ensure wide reach and high participation rates. The emphasis was on voluntary participation, ensuring unbiased and genuine responses from a representative segment of the librarian population.

3.3 Data Analysis and Sampling

To ascertain the reliability of the data collected, particularly the ICT variables, we employed Cronbach's alpha as our statistical tool. The overall reliability score was remarkably high at 0.987, indicating the questionnaire's robustness in measuring ICT competencies. This score was further corroborated by specific variables, such as "Development of information and communication technology-based library information systems" and "Utilization of information communication technology for the library." The sampling strategy was carefully designed to reflect the broader librarian population. With a total population of 1,056 librarians, the chosen sample size of 208 respondents was determined to provide a 95% confidence level with a margin of error of 6.1%. This approach aligns with the principles of accidental random sampling, ensuring that the sample adequately represents the larger population and that the findings are generalizable.

Table 1 Respondent Demographics according to Gender ($N = 208$)

Variable	Category	Gender			
		Male		Female	
		n	%	*n*	%
Age	Under 24 years old	2	1.0	4	1.9
	25–34	33	15.9	32	15.4
	35–44	38	18.3	34	16.3
	45–54	34	16.3	15	7.2
	55–64	11	5.3	5	2.4
	$\chi^2(4, n = 208) = 6.877, p = 0.143$				
Last education	High School/Equivalent	2	1.0	2	1.0
	Diploma 2	3	1.4	2	1.0
	Diploma 3	12	5.8	15	7.2
	Diploma 4 or undergraduate degree	76	36.5	47	22.6
	Master's degree	24	11.5	23	11.1
	Doctoral degree	1	0.5	1	0.5
	$\chi^2(5, n = 208) = 3.690, p = 0.595$				
Study program in last education	Library and information science	69	33.2	52	25.0
	Non-library and information science	49	23.6	38	18.3
	$\chi^2(1, n = 208) = 0.010, p = 0.516$				
Library type	Special library	15	7.2	20	9.6
	National library	1	0.5	3	1.4
	Academic library	56	26.9	32	15.4
	Public library	46	22.1	35	16.8
	$\chi^2(3, n = 208) = 6.095, p = 0.107$				
Length of work	< 1 year	16	8.0	15	7.5
	2–5 years	27	13.6	25	12.6
	6–9 years	19	9.5	16	8.0
	10–13 years	18	9.0	14	7.0
	14–17 years	13	6.5	2	1.0
	18–21 years	7	3.5	6	3.0
	22–25 years	4	2.0	3	1.5
	26–29 years old	4	2.0	3	1.5
	> 30 years	5	2.5	2	1.0
	$\chi^2(8, n = 208) = 7.048, p = 0.531$				
Apart from working in the information and communication technology division, do you work in other areas?	No	57	27.4	45	21.7
	Yes, I also work in the field of library services	23	11.1	20	9.6
	Yes, I also work in the field of preservation of library materials	8	3.8	7	3.4
	Yes, I also work in library collection development	19	9.1	7	3.4
	Yes, I also work in the field of organizing library materials	11	5.3	11	5.3
	$\chi^2(5, n = 208) = 7.940, p = 0.160$				

Source: Data Processing by author (2020)

4. RESULTS AND DISCUSSION

4.1 Demographic Analysis

Table 1 presents the demographic profile of 208 librarian respondents, comprising 118 men (56.7%) and 90 women (43.3%). The predominant age group was 35–44 years (34.6%), with the majority possessing 2–5 years of work experience (25%). Over half of the respondents were library and information science undergraduate program graduates (58.2%), with males representing 36.5% and females 22.6%. Male librarians primarily worked in academic libraries (26.9%), whereas females were more commonly employed in public libraries (16.8%). Beyond their ICT division roles, librarians frequently contributed to other divisions, including library services (males = 23, females = 20), library collection development, organizing library materials, and preserving library materials.

Chi-square tests examining the influence of gender on demographic characteristics revealed no significant differences related to age, educational level, field of study, library type, and work tenure concerning ICT-related competencies. These results indicate gender parity among librarians in the ICT division, contradicting previous research suggesting a disparity in IT engagement by female librarians (Rogers, 2015; Singh et al., 2020). Nevertheless, this does not address potential discrepancies in ICT competence between genders, warranting further investigation.

The respondents spanned age categories from 'Under 24 years old' to '55–64', with a chi-square test yielding no significant gender correlation ($\chi^2(4, n = 208) = 6.877$, $p = 0.143$). Educational qualifications ranged from 'High School/Equivalent' to 'Doctoral degree,' with most holding 'Diploma 4 or undergraduate degree' or a 'Master's degree,' and again, chi-square analysis showed no significant gender difference ($\chi^2(5, n = 208) = 3.690$, $p = 0.595$).

The field of study was classified into 'Library and information science' and 'Non-library and information science,' with no significant gender-based variation ($\chi^2(1, n = 208) = 0.010$, $p = 0.516$). Work settings varied across 'Special library,' 'National library,' 'Academic library,' and 'Public library,' with no significant difference in employment between male and female librarians ($\chi^2(3, n = 208) = 6.095$, $p = 0.107$).

Regarding tenure, experiences ranged from '< 1 year' to '> 30 years', with no significant gender association ($\chi^2(8, n = 208) = 7.048$, $p = 0.531$). Additionally, roles outside the ICT division showed no significant gender discrepancy ($\chi^2(5, n = 208) = 7.940$, $p = 0.160$).

In summary, the demographic and professional data portray a range of ages, educational backgrounds, work settings, and roles among librarians, with an absence of significant gender disparities. This finding suggests balanced gender representation in the library profession, though the uniform chi-square results may reflect a sample size insufficient to detect differences or demographic homogeneity. Further peer assessment research could provide a more objective measure of ICT competencies.

4.2 Gender Analysis of Librarians' ICT-related Competencies

In the 2019 Indonesian National Qualifications Framework for Libraries (SKKNI), ICT-related competencies are divided into two variables: 1) Development of ICT-based library information systems, which consists of 26 indicators, and 2) Utilization of ICT for the library, which consists of 18 indicators. To answer the research question, we describe the descriptive relationship between gender and two ICT-related variables based on the SKKNI 2019.

4.2.1 Development of ICT-based Library Information Systems

The initial variable distinctly demonstrates the divergent self-perceptions of competency between male and female librarians in library system information and communication technology (ICT) development. Males rated their competence marginally below 'Fair' for the relevant indicators

(mean average of 2.70), while females self-assessed their competence as 'Poor' (mean average of 2.01). Specifically, males identified their ability to 'Overcome attacks on the network' as 'Poor' (n = 31), yet considered their competency in 'Installing library automation apps' ranging from 'Good' to 'Excellent.' Conversely, females predominantly rated their competencies as 'Very Poor,' with a notable exception for 'Installing library automation,' where they acknowledged a 'Fair' level of competence (n = 32). The analysis reveals a higher self-perception of competence among male librarians in developing ICT-based library systems than female librarians. The chi-square test

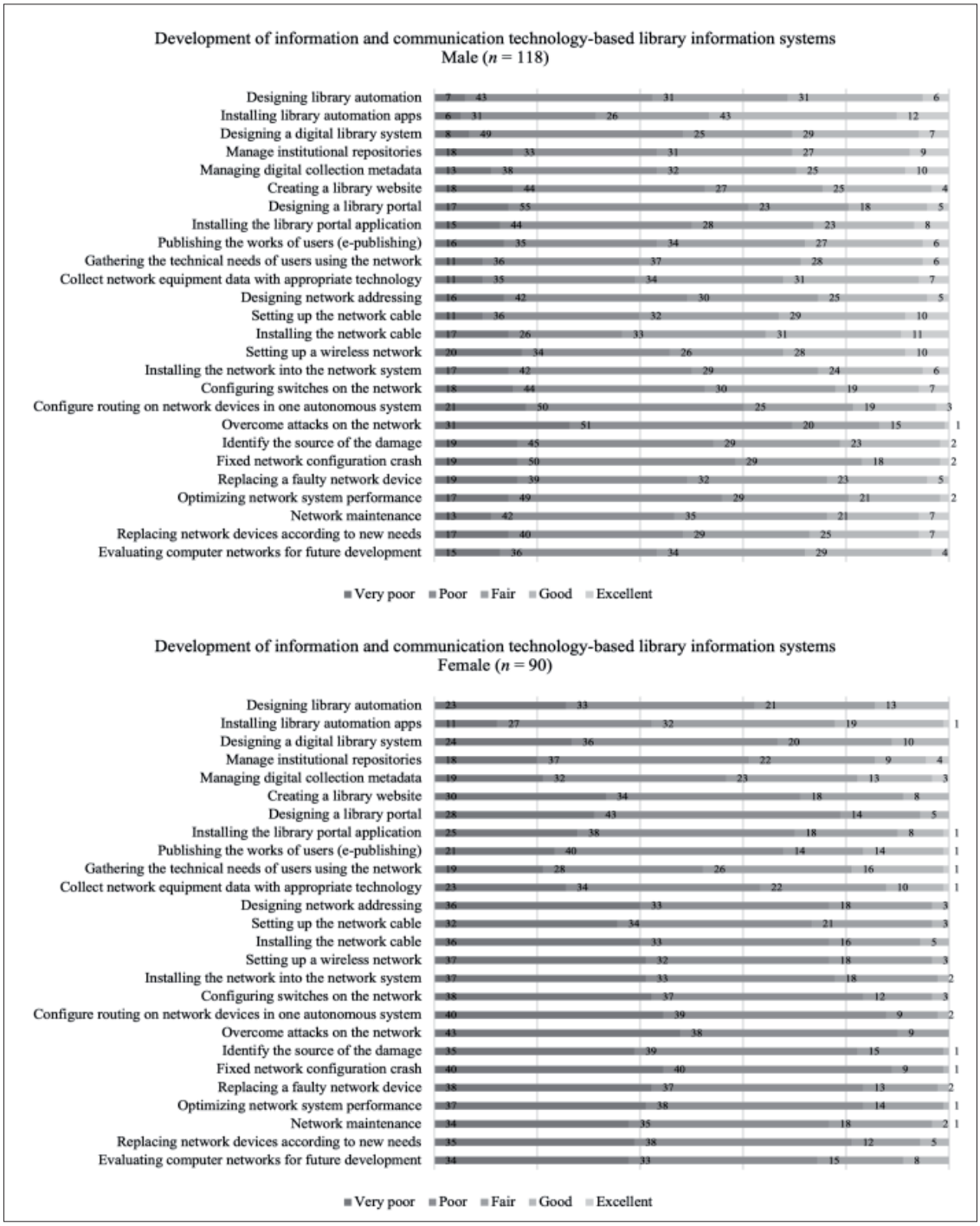

Figure 1 Differences in the variable "Development of ICT-based library information systems" for males and females

Source: Data Processing by author, 2020

confirms a statistically significant association between gender and ICT development competency in library systems, $\chi^2(4, n = 208) = 26.844$, $p < 0.000$.

The bar charts under examination categorize responses from a survey querying the development quality of ICT-based library information systems, with differentiation by gender—males (n = 118) and females (n = 90). The charts assess a series of tasks integral to library systems, such as 'Designing library systems,' 'Installing and managing systems,' 'Gathering and collecting technical equipment,' and 'Configuring routers and network devices', with respondents rating each task from 'Very Poor' to 'Excellent.'

In both charts, responses predominantly cluster around the 'Fair' and 'Good' categories for most tasks, although there are discernible variances between the genders in the rating of certain tasks. The charts suggest that both groups perceive the quality of ICT development in library systems as ranging from average to good, indicating potential areas for enhancement. The lack of task-specific ratings as 'Very Poor' or 'Excellent' underscores a general call for improvement. Precise ratings for each task are obscured without corresponding numerical data.

This information can guide developers of library information systems in pinpointing development deficits and adapting to the differential quality perceptions between genders. It could further assist academic institutions and library administrations in strategizing development and educational initiatives. These charts may also contribute to broader research on gender-related disparities in the perception and implementation of technological advancements within academic libraries.

4.2.2 Utilization of ICT for the Library

The presented figures are bar charts illustrating male (n = 118) and female (n = 90) librarians' self-evaluated proficiency in utilizing information communication technology (ICT) for library services. The skills assessed encompass a comprehensive suite of ICT tools and software, with proficiency levels rated from 'Very Poor' to 'Excellent.'

The skills analyzed include using computer devices, peripheral equipment, and both basic and advanced levels of word processing, spreadsheet, and presentation software, alongside the installation of operating systems. Other assessed competencies involve navigating web browsers, employing email and social media applications, leveraging internet-based library applications, handling multi-platform software for libraries, managing citation software, curating electronic resource packages, and overseeing e-journals. Response aggregation for each skill predominantly falls within the 'Fair' to 'Good' proficiency range in both charts, with a paucity of ratings at the extremes of 'Very Poor' or 'Excellent.' This trend indicates moderate to good perceived competence among librarians in ICT-related tasks.

A comparison of the two charts indicates parallel distributions of self-assessment ratings between male and female librarians, although the lack of detailed numerical data precludes a definitive analysis of significant gender-based differences in self-assessment. These visual representations can be a pivotal resource for library management to pinpoint areas of high librarian confidence and identify skill gaps necessitating additional training. Insights into librarians' self-perceived ICT competencies can inform the development of targeted professional enhancement programs and strategic decision-making concerning technological investments and resource distribution in library environments.

A notably higher proportion of 'Good' ratings in electronic journal management suggests librarians' relative self-assurance in this area. In contrast, fewer 'Good' ratings in advanced spreadsheet software utilization indicate a potential area for concentrated skill development. Collectively, the charts convey that librarians possess a moderate assurance in their ICT proficiencies, albeit with variations across specific competencies. This data establishes a foundation for subsequent ICT skill development research and aids library administrations in fortifying staff ICT capabilities.

Concerning the second variable, males predominantly rate their competencies as approaching 'Good' (mean average of 3.22), while females' average ratings align with 'Fair' (mean average of 2.74). Females have indicated 'Poor' proficiency in utilizing peripheral equipment (n = 29). Both genders have self-reported 'Good' proficiency in using social media apps, email clients, and web browsers and have professed good literacy in internet-based applications. Hence, it is inferred that both male and female librarians perceive themselves as proficient in employing ICT-based tools.

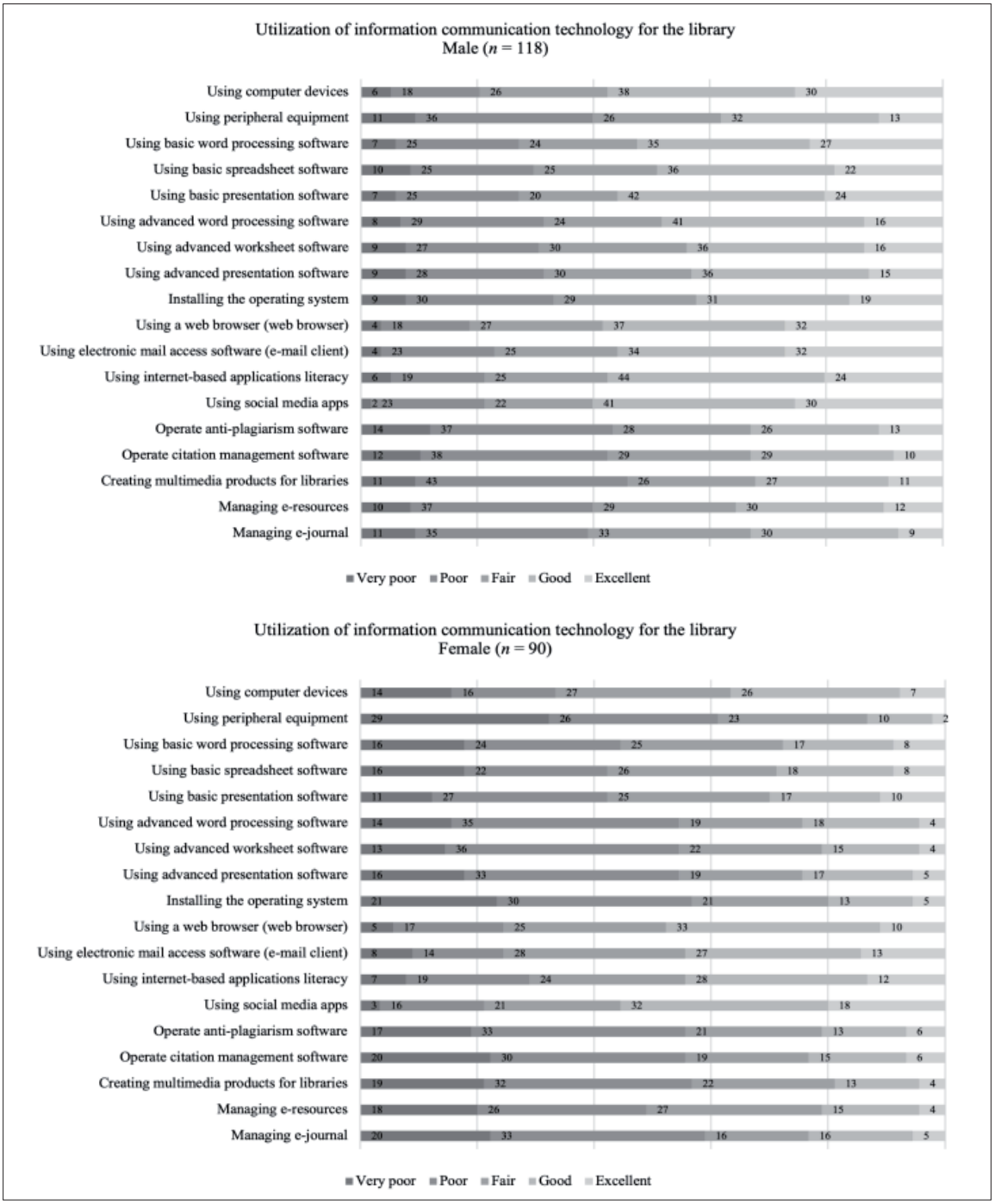

Figure 2 Differences in the variable "Utilization of ICT for the library" for males and females
Source: Data Processing by author, 2020

Chi-square analysis substantiates a significant correlation between gender and ICT utilization in library settings, $\chi^2(4, n = 208) = 12.699$, $p = 0.013$. Our research reveals that the competencies outlined in the 2019 SKKNI framework do not reflect the reported competencies of both male and female librarians. The scarcity of 'Excellent' competency ratings against SKKNI indicators implies a potential gap in applying this national standard. The findings suggest a need for refinement of SKKNI indicators or a more in-depth analysis of the pertinent policy. Nevertheless, the influence of self-assessment on the reported low competency levels cannot be overlooked. Future studies should incorporate peer evaluations to garner more objective competency appraisals.

This research provides evidence of a nuanced distinction in the self-perceived ICT competencies between male and female librarians. Notably, it was observed that both genders tend to utilize technology more frequently than they engage in its development. Additionally, this study uncovers significant disparities in ICT development, warranting further investigation to elucidate the underlying factors contributing to this phenomenon. The findings advocate for targeted educational and training programs for female ICT librarians. Such initiatives would bolster their skills in ICT development, including design, installation, creation, and evaluation.

This study challenges previous research's assertions, positing that the correlation between gender differences and technology usage is relatively insubstantial (Arrosagaray et al., 2019; Cai et al., 2017; Carson & Little, 2014). In contrast, our findings suggest a more pronounced gender-based disparity in ICT competencies. Furthermore, this study addresses societal stereotypes highlighted in existing literature, often associating IT roles predominantly with male professionals (Gebhardt et al., 2019; Mansour, 2017). Our results contribute to a growing body of evidence that questions these stereotypes and underscores the need for more inclusive and gender-sensitive approaches in ICT, particularly within the librarian profession.

This study's findings resonate with those of Singh et al. (2020), who observed that men are often perceived as forward-thinking and deeply analytical, while women are typically associated with the ease of product use. Consistent with the observations of Ahmed and Sheikh (2021), our study confirms that librarians are adept at utilizing online utility software and social media platforms. The implications of these findings are significant for university library and information science study program organizers. They underscore the need for a strategic curriculum overhaul, particularly enhancing student ICT competencies. Such curriculum development is crucial to prepare future librarians and Library and Information Science (LIS) professionals with the necessary skills to navigate the evolving digital landscape.

Moreover, our research contributes to the broader discourse on the 'usage divide,' which represents the second level of the digital divide. It provides insights into digital literacy and digital equity among librarians in Indonesia. By highlighting these aspects, the study underscores the importance of equitable access to digital tools and resources, ensuring that librarians are equipped to use, develop, and innovate within the ICT domain. This focus on digital literacy and equity is pivotal in bridging the existing gaps and fostering a more inclusive digital environment for librarians and information professionals in Indonesia.

5. CONCLUSION

This study's analysis indicates that gender does not significantly correlate with other demographic variables concerning ICT-related competencies among librarians. It was observed that male librarians tend to perceive themselves as more proficient in developing ICT skills, whereas female librarians primarily view themselves as competent in using or utilizing ICT. Notably, this research encounters limitations, including its geographic scope and the novelty of the data collection instrument, which is based on government policy and had not been previously employed in scholarly research.

The research findings are instrumental in assessing the effectiveness of the Indonesian government's policies on technological competencies in the library sector. Furthermore, these insights have broader applicability, potentially informing ICT-related developmental strategies in other sectors, such as education and culture. It is particularly relevant in addressing the second level of the digital divide among librarians. Additionally, the reliance on self-reported data in this study may introduce subjective biases in assessing ICT competencies. Furthermore, due to the cross-sectional nature of the survey, this research cannot establish causality between gender and ICT competencies among librarians.

The implications of this study for future research are significant. It suggests that subsequent investigations should delve deeper into understanding librarians' attitudes, behaviors, and motivations. Such research is essential to foster an environment where both male and female librarians are equally encouraged and supported to develop and apply their ICT competencies, particularly in the realm of ICT development within library settings. This approach is crucial for promoting a more balanced and inclusive growth in technological proficiency among library professionals.

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