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# Comparing Digital Literacy Skills Gap Index: A Case from Pakistan and Indonesia

**Muhammad Younus[12]*, Achmad Nurmandi[1], Dyah Mutiarin[1], Halimah Abdul Manaf[3], Andi Luhur Prianto[4], Imelda Zamjanah Rahmawati[5]**

[1]Universitas Muhammadiyah Yogyakarta, Indonesia
[2]Department of Product Research and Software Development, Pakistan
[3]Universiti Utara Malaysia, Malaysia
[4]Universitas Muhammadiyah Makassar, Indonesia
[5]Universitas Muhammadiyah Cirebon, Indonesia

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**ABSTRACT**

This paper thoroughly analyzes the computerized proficiency of two critical South Asian countries, Pakistan and Indonesia. This groundbreaking inquiry examines the rising importance of advanced education inside the worldwide circle, explaining the deterrents and conceivable outcomes these nations experience in an increasingly digitized society. This considers employment a thorough mixed-method approach to assess essential viewpoints of computerized proficiency competencies, enveloping mechanical availability, capability in computerized proficiency, and consolidating computerized instruments in instructive and word-related settings. Through a comparative examination of the investigative discoveries from Pakistan and Indonesia, the information for the comparative ponder is taken from the Wiley Computerized Aptitudes Crevice File site. The results of our study propose that Pakistan and Indonesia significantly impede computerized proficiency. In any case, it is fundamental to note that there are recognizable contrasts within the characteristics and greatness of these incongruities. Pakistan must illustrate a more pronounced division characterized by errors within the accessibility of computerized assets and conceivable outcomes for preparing. In differentiation, Indonesia is hooked on challenges concerning advanced substances and the genuineness of the data. Also, it gives commonsense proposals for policymakers, teachers, and partners in nations like Pakistan, Indonesia, and other creating economies working towards leveraging the openings displayed by the advanced times.

## 1. INTRODUCTION

In today's globalized and mechanically progressed society, obtaining advanced education has become a fundamental and non-negotiable competency. Computerized education (Pagani et al., 2016) Alludes to the capacity to capably explore, fundamentally evaluate, and capably utilize computerized data and advances to lock in within the computerized society effectively. The noteworthiness of computerized proficiency cannot be downplayed in light of today's society's developing dependence on advanced communication, instruction, trade, and administration stages. By the way, countries have a dissimilarity concerning their capability for advanced proficiency. Aberrations in computerized proficiency levels can have noteworthy repercussions for all perspectives of society, counting social, financial, and instructive results. This ponder points to performing a comparative examination of the Computerized Proficiency Aptitudes Crevice File in two particular nations, Pakistan and Indonesia. This case considers points to explain the winning holes in computerized education abilities. Besides, look at the factors contributing to these varieties. Through a comprehensive investigation of these two countries, we offer critical viewpoints that can direct the advancement of arrangements and programs planning to upgrade advanced education in comparable worldwide settings (Sezgin, 2017).

This research identifies the primary issue to be addressed: the digital literacy skills gap between Pakistan and Indonesia. Understanding this gap is crucial, as digital literacy plays a significant role in the

*Corresponding author
E-mail addresses: mohammedyounusghazni@gmail.com

modern world, influencing societal and economic development. In Pakistan, limited digital literacy can hinder access to information, reduce employment opportunities in the growing digital economy, and impede educational progress. Similarly, in Indonesia, while the country has made strides in digital adoption, disparities in digital literacy can exacerbate social inequalities and limit economic potential (Tzoc & Ubbes, 2017). By comparing these two countries, the research aims to highlight the specific areas where each nation falls short and how these deficiencies impact their respective societies and economies. More detailed insights into these direct impacts will underscore the importance of addressing the digital literacy gap and provide a stronger foundation for proposing targeted interventions and policy recommendations. Strengthening the research background with these details will illustrate the broader significance of digital literacy, making the case for why addressing this gap is essential for Pakistan's and Indonesia's holistic development.

The advanced partition (James, 2014) There is a critical worldwide concern regarding the dissimilarity between people with access to computerized advances and those without the capability to utilize them proficiently and others without such get to and aptitudes. Inside the overarching issue, a particular subgroup relates to the procurement and capability of computerized proficiency competencies. Numerous people require more capacity to explore the computerized environment viably, constraining their capacity to profit from instructive, word-related, and civic prospects. Within the specific setting of Pakistan and Indonesia, both countries experience particular deterrents and prospects for computerized proficiency. Pakistan, a South Asian country, and Indonesia, an archipelago in Southeast Asia, have eminent populace development rates, showing contrasting levels of getting to advanced advances. The request develops regarding the differences in the size of computerized education abilities in these two countries and the causes that contribute to it.

Recent literature examining the evolving landscape of digital literacy and its socio-economic impacts in Pakistan and Indonesia is crucial to strengthening the research background. Studies from the past five years highlight how rapid technological advancements and increased internet penetration have reshaped educational and economic opportunities. For instance, recent reports by the World Bank and UNESCO emphasize the critical role of digital literacy in bridging educational gaps and enhancing employability. Furthermore, recent surveys by organizations such as the International Telecommunication Union (ITU) provide up-to-date data on digital literacy rates and their direct correlation with economic growth and social inclusion. Incorporating these contemporary sources not only validates the current relevance of the digital literacy gap but also underscores its urgency, thereby reinforcing the problem formulation and enhancing the overall credibility of the research.

The digital literacy skills gap between Pakistan and Indonesia highlights disparities in access to and proficiency in digital technologies and has profound implications for societies and economies. In Pakistan, limited digital literacy restricts individuals' ability to access online education, engage in e-commerce, and participate in digital governance, exacerbating socio-economic inequalities and hindering economic growth. Similarly, in Indonesia, the digital divide hampers innovation, reduces productivity, and limits the reach of digital financial services, which are crucial for inclusive economic development. Addressing this gap is essential for fostering equitable socio-economic progress, enhancing employability, and ensuring that both countries can fully leverage digital technologies for sustainable development. By examining these impacts, the research aims to provide a comprehensive understanding of the significance of digital literacy in driving social and economic advancements in Pakistan and Indonesia.

The research background can be enhanced by explicitly identifying the specific needs and challenges faced by communities in Pakistan and Indonesia regarding digital literacy. In Pakistan, key challenges include inadequate infrastructure, such as limited broadband access in rural areas, and a lack of digital education in the school curriculum, which leaves many individuals needing more digital skills. Additionally, socio-economic barriers, including poverty and gender disparity, significantly hinder access to digital resources. In Indonesia, while there is a higher rate of mobile internet usage, the quality of digital skills remains a concern, with many individuals needing more advanced digital competencies required for the modern workforce. Moreover, language barriers and regional disparities between urban and rural areas exacerbate the digital literacy gap. Addressing these specific challenges is crucial for developing targeted interventions to improve digital literacy rates and ensure inclusive digital growth in both countries.

To address the urgency of the research, it is crucial to present concrete data and evidence on the direct impact of the lack of digital literacy in Pakistan and Indonesia. In Pakistan, studies indicate that only 17% of the population possesses basic digital skills, leading to significant barriers to online education and e-government services, exacerbating educational inequities, and limiting civic participation. Additionally, the country's digital economy contributes less than 1% to the GDP, highlighting the missed economic opportunities due to low digital literacy. In Indonesia, although internet penetration stands at 70%, a large portion of the population lacks essential digital skills, hindering their ability to engage in e-commerce and

digital banking. This digital literacy deficit has been linked to reduced productivity and innovation, with the digital economy accounting for only 4% of the GDP compared to higher percentages in more digitally literate nations. These statistics underscore the critical need to address the digital literacy gap to enhance socio-economic development in both countries.

The strategy for conducting this thought is based on the presentation that progressed instruction (Hallam et al., 2018) plays a noteworthy portion in driving monetary headway and developing fortifying. Inside the present-day period characterized by the unavoidable effect of computerized development, it is significant to prioritize the evenhanded get to and advancement of computerized education abilities for people from different foundations. Through the execution of a comparative investigation, our objective is to contribute to cultivating a break-even with an advanced future in Pakistan and Indonesia. Besides, this investigative endeavor points to amplifying its effect on other countries experiencing comparable deterrents in this space. This study distinguishes itself from previous research by offering a comparative analysis of digital literacy skills between Pakistan and Indonesia, focusing on the unique socio-economic contexts of both countries. While prior studies have typically examined digital literacy within individual countries or regions, this research directly compares how cultural, infrastructural, and policy differences impact digital literacy rates and their associated outcomes. Additionally, this study integrates recent data and leverages a mixed-methods approach, combining quantitative metrics with qualitative insights from community stakeholders to comprehensively understand the digital literacy landscape. By doing so, it identifies common challenges and best practices and offers tailored recommendations for each country. This nuanced analysis contributes to the existing body of knowledge by emphasizing the importance of context-specific strategies in addressing the digital literacy gap and informing policymakers and educators in Pakistan and Indonesia.

The inquiry is essentially centered on accomplishing the taking after points and targets: (1) an orderly approach is essential to develop a comprehensive Advanced Education Abilities Crevice Record. Creating a comprehensive record that assesses advanced education aptitudes in Pakistan and Indonesia while considering components such as get-to, fundamental aptitudes, and progressed aptitudes is essential, (2) to observe inconsistencies, it is fundamental to thoroughly analyze the information to recognize varieties in computerized education levels over different statistic cohorts. These cohorts envelop numerous variables, such as age, sex, instructive fulfillment, and financial standing, (3) to examine the primary causes, it is essential to examine the numerous components contributing to the watched errors in computerized education abilities. This involves analyzing the capacities of instruction frameworks, legislative arrangements, and the advancement of foundation advancement, and (4) to propose approach proposals, Drawing upon the inquiry about discoveries, show evidence-based arrangement recommendations for the advanced proficiency dissimilarity in both countries.

## 2. METHODS

The show Ponder utilizes a mixed-method investigative technique to carry out a comparative examination of the Advanced Education Abilities Hole Record in Pakistan and Indonesia. The investigative strategy is about coordinating quantitative and subjective strategies to analyze the advanced education aptitude scene within the nations comprehensively said over. The investigation commences by embracing a quantitative technique, which centers on efficiently gathering and examining numerical data to build an Advanced Education Aptitudes Crevice List. The development of this file will be based on different factors, counting measurements such as the degree of web infiltration, accessibility of computerized gadgets, and levels of competency in computerized proficiency. This will enable a precise comparison between Pakistan and Indonesia to be made. In conjunction with the quantitative information, a subjective examination will be attempted by looking at interviews and overviews of essential partners, including teachers, policymakers, and masters in computerized proficiency. Counting subjective knowledge will offer a relevant system for quantitative discoveries, encouraging a more comprehensive comprehension of the different components contributing to the computerized abilities crevice.

The essential information sources utilized in this investigation are freely open factual information from government organizations, worldwide organizations, and instructive education. Moreover, interviews and studies will be perused, focusing on a purposive test of people speaking to differing segments in both countries. In arrange to gather related information, the analyst will utilize particular watchwords, like - "advanced proficiency," "web infiltration," "computerized get to," and "instructive results," to conduct a comprehensive seek for government reports, studies, and investigative papers. Channels will be actualized to ensure the judgment of the procured information and its money, unwavering quality, and specificity to the districts of Pakistan and Indonesia.

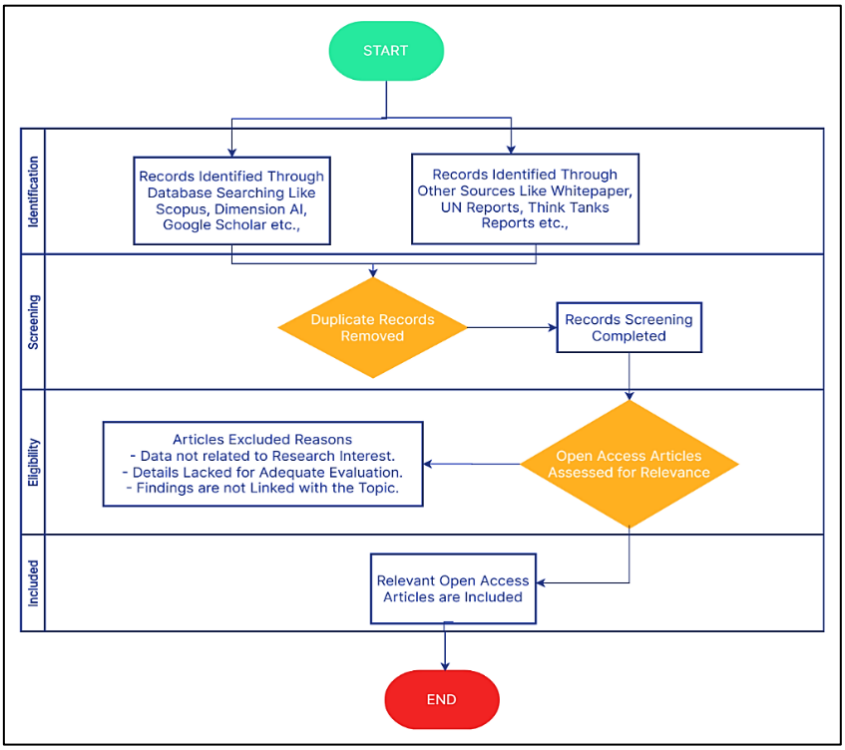


**Figure 1.** Prisma Flow Diagram for Review Qualitative Data

Quantitative information will be prepared and examined using factual computer program devices, such as JASP and Exceed Expectations. These devices encourage the improvement of the Advanced Proficiency Aptitudes Crevice List and the computation of a few measurable measures, such as the cruel, standard deviation, and relationship coefficients. The subjective information will be interpreted and subjected to topic investigation utilizing a specialized program such as NVivo. The utilization of this program will encourage the recognizable proof of rehashing topics, designs, and bits of knowledge determined from the subjective information.

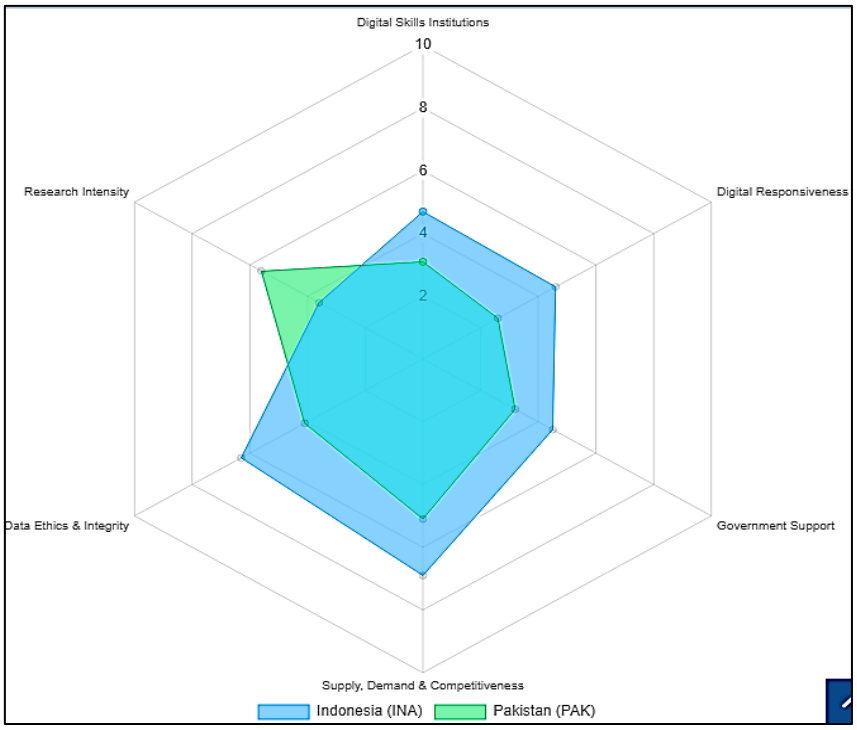


**Figure 2.** Display of General Score Based on Index Indicators – Source: https://dsgi.wiley.com/

To address concerns regarding the research instrument's implementation, validity, and reliability, this study employs a rigorous methodology to ensure robust and trustworthy results. The research instrument, comprising research publication and quantitative data of the DSG Index, will be checked and tested in Pakistan and Indonesia to refine questions and ensure cultural relevance. This pilot testing phase will involve a representative sample from various demographic groups to identify and rectify any ambiguities or biases. For validity, the instrument will be reviewed by digital literacy and socio-economic research experts to confirm that it accurately measures the intended constructs. To ensure reliability, the study will use established statistical techniques, such as Cronbach's alpha, to assess internal consistency. Repeated measures and triangulation with secondary data sources will be employed to cross-verify findings. These steps will collectively ensure the research instrument is valid and reliable, providing credible and generalizable insights into the digital literacy skills gap in Pakistan and Indonesia.

## 3. RESULT AND DISCUSSIONS

### Comparing Markers of Advanced Proficiency Aptitudes Hole Record

Underneath, we will compare each Advanced Education Aptitudes Gap Index marker for a higher understanding. It would be ideal if you note that the primary column will appear as the pointer, the moment column will appear as the score of Indonesia, and the third column will appear as the score of Pakistan against the marker.

Comparing Computerized Aptitudes Teach

A comparative examination of the Computerized Aptitudes Teach of Computerized Proficiency Abilities Crevice List, created by Wiley, for Pakistan and Indonesia, gives critical perceptions concerning the advanced proficiency situation in these nations. This detailed investigation uncovers that Pakistan has created a solid advanced aptitude framework characterized by outstanding development within the accessibility of teaching digital literacy programs. Regardless of this extension, a considerable dissimilarity exists between the accessibility and necessity for advanced proficiencies, recommending conceivable insufficiencies within the caliber and relevance of these instructive activities. On the other hand, despite experiencing challenges in extending its computerized abilities, Indonesia illustrates a more evenhanded hole record, showing a comparatively harmonized computerized aptitudes biological system. This infers that the programs advertised in Indonesia are more adjusted to the particular prerequisites of the labor advertise, driving a more compelling utilization of computerized skills resources. Encouragement is essential to investigate the exact components contributing to these disparities and provide insights for policy-making endeavors to narrow the advanced proficiency partition in both countries.

| | | |
|---|---|---|
| **Digital Skills Institutions** | **4.7** | **3.1** |
| Digital Skills upon Graduation | **6.7** | - |
| Availability of Corporate Digital Staff Training | **5.0** | - |
| Enablement of Teachers and Faculty in Data Science and Analytics | **4.8** | - |
| Years of Schooling | **5.1** | **2.9** |
| Maths Literacy | **2.0** | **2.4** |
| Tertiary Graduates (IT) | **5.4** | **2.3** |
| Staff Training | **6.6** | **4.8** |

**Figure 3.** Presenting Scores of Digital Skills Institutions Indicator – Source: https://dsgi.wiley.com/

Comparing Computerized Responsiveness

A comparative examination of the Advanced Responsiveness markers of the Advanced Proficiency Aptitudes Crevice Record, defined by Wiley, sheds light on the advanced education scenarios in Pakistan and Indonesia. Even though both nations confront comparative challenges in tending to the advanced abilities hole, unmistakable varieties have become clear. Pakistan must illustrate an imperceptibly second-rate composite record score, essentially inferable to the confined accessibility of computerized foundation in removed zones and lessened openings for computerized proficiency preparation. On the other hand, Indonesia includes a comparatively lifted file score, demonstrating a more versatile advanced education environment moved by broad government activities and expanded support from the commercial division.

By the by, Indonesia experiences unmistakable deterrents particular to its setting, counting incongruities in computerized proficiency levels throughout its heterogeneous districts. This comparison highlights the noteworthiness of customized approaches in moving forward with computerized education and responsiveness, considering different countries' socio-economic and topographical circumstances.

| | | |
|---|---|---|
| **Digital Responsiveness** | **4.6** | **2.6** |
| Responsiveness of national skills development systems | **5.3** | - |
| Responsiveness of the education system | **6.7** | - |
| Digital Skills among Population | **6.1** | **5.0** |
| Global science and technology skills | **1.2** | **0.2** |

**Figure 4.** Presenting Scores of Digital Responsiveness Indicator – Source: https://dsgi.wiley.com/

Comparing Government Bolster

A comparative examination of the Government Bolster of Computerized Proficiency Aptitudes Hole Record, as made by Wiley, for Pakistan and Indonesia yields noteworthy experiences into the particular endeavors embraced by both countries to address the advanced hole. The file considers numerous variables, enveloping arrangement measures, framework advancement, and instructive programs. This comparative investigation highlights Pakistan as a country that has recently accomplished significant advances, especially in growing its advanced framework and executing computerized education activities. There are continuous challenges in ensuring these resources' reasonable and fair-minded accessibility, particularly in country districts. In any case, it is worth noticing that Indonesia has too accomplished critical headways in improving the computerized network in removed zones. Be that as it may, a divided administrative scene and variety in the quality of computerized instruction programs create critical issues. To successfully handle these errors, both countries must prioritize arrangement consistency, cultivate collaboration between the government and commercial divisions, and execute focused intercessions to upgrade computerized education capacities over all fragments of their particular populaces.

| | | |
|---|---|---|
| **Government Support** | **4.5** | **3.2** |
| Government understanding of the digital skills landscape | **5.5** | - |
| Government commitment to closing the Digital Skills gap | **5.7** | - |
| Coordination among government, employers, and academia | **5.0** | - |
| Importance of ICTs to Government Vision | **5.5** | **3.1** |
| Government Success in ICT Promotion | **5.0** | **3.3** |

**Figure 5.** Presenting Scores of Government Support Indicator – Source: https://dsgi.wiley.com/

Comparing Supply, Request & Competitiveness

The examination of the pointers of the Supply, Ask, and Competitiveness of Progressed Instruction Capacities Cleft Record, as made by Wiley, for Pakistan and Indonesia gives basic discernments concerning the current status of progressed capability in these countries. The current state of computerized capability in Pakistan ought to be moved forward, as illustrated by lower educator resources and computerized system evaluations. A noteworthy requirement exists for these proficiencies, as seen by the growing web exhibit and the expanded computerized assimilation interior of the masses. On the other hand, the circumstances in Indonesia display a more unbiased transport of supply and ask, characterized by an energetic computerized establishment and an extending intrigue in securing computerized capability competencies. Be that because it may, both nations outline a contrast in competitiveness, deducing that

despite their progressions, they experience deterrents in guaranteeing that their labor drive remains comprehensive and competitive inside the computerized space. This recommends that both countries execute centered exercises in instruction and get ready to restrain the difference in progressed aptitudes and develop their all-inclusive competitiveness inside digitalization.

| | | |
|---|---|---|
| **Supply, Demand & Competitiveness** | **6.9** | **5.1** |
| Digital Skills match/mismatch between employers' needs and job seekers' talents | **6.9** | - |
| Ease of hiring foreign labor to bridge the digital skills gap | **6.5** | - |
| The size of the STEM gender gap | **7.1** | - |
| Digital Skills as a competitive advantage or disadvantage | **6.5** | - |
| Availability of Scientists and Engineers | **6.1** | **4.7** |
| Ease of Finding Skilled Employees | **7.0** | **6.1** |
| Ease of Hiring Foreign Labor | **5.5** | **4.4** |
| Gender Gap of Graduates from STEM | **6.3** | **4.8** |
| World Digital Competitiveness Index | **5.8** | **5.5** |

**Figure 6.** Presenting Scores of Supply, Demand & Competitiveness Indicator – Source: https://dsgi.wiley.com/

Comparing Information Morals & Judgment

A few critical contrasts became clear upon looking at the information morals and keenness pointers in Wiley's Advanced Proficiency Abilities Crevice Record for Pakistan and Indonesia. The file considers essential issues inside Pakistan's particular setting, such as the defending and privacy of information and the nearness of comparatively weaker lawful structures and systems overseeing information and its administration. Besides, there is less accentuation on moral contemplations, almost gathering and abusing information, proposing a conceivable requirement for expanded consideration toward capable information hones. On the other hand, in Indonesia, the score may illustrate a more vigorous administrative system and a more noteworthy level of awareness concerning information morals. In any case, there may still be persevering deterrents concerning computerized proficiency and cybersecurity mindfulness, requiring a center on creating the aptitudes fundamental for securely and morally exploring the advanced domain. In common, a careful assessment of these pointers highlights the requirement for customized approaches in handling the particular challenges related to information morals and judgment experienced by person nations in their endeavors to advance computerized education and guarantee dependable utilization of information.

| | | |
|---|---|---|
| **Data Ethics & Integrity** | **6.3** | **4.1** |
| Workers' ability to handle data ethically | **4.8** | - |
| Cyber Security Performance | **7.8** | **4.1** |

**Figure 7.** Presenting Scores of Data Ethics & Integrity Indicator – Source: https://dsgi.wiley.com/

Comparing Investigate Concentrated

The comparative examination of the inquiry about concentrated markers of the Computerized Proficiency Aptitudes Hole File, created by Wiley, between Pakistan and Indonesia offers noteworthy knowledge about the computerized education scene inside these countries. The file consolidates different components, such as innovative get-to, instructive assets, advanced foundation, and the level of advanced aptitudes inside the populace. Pakistan and Indonesia display eminent fluctuations in a few regards. Pakistan has illustrated critical headways in upgrading computerized openness, as proven by a discernible increase in people utilizing the Web. Indonesia has a more comprehensive computerized framework and a

quickly extending innovation division. Both countries experience impediments when ensuring reasonable and comprehensive accessibility and advancing capability in computerized aptitudes. The comparative investigation will encourage the recognizable proof of particular spaces in which each nation can pick up bits of knowledge from the triumphs and challenges of the other. This information trade will viably address the computerized abilities crevice, cultivating computerized incorporation and fortifying financial development.

| | | |
|---|---|---|
| **Research Intensity** | **3.6** | **5.6** |
| Academic Articles per '000 Graduates | **2.0** | **4.0** |
| Academic Articles Growth | **10.0** | **8.0** |
| Academic Articles by Wiley | **-** | **5.0** |

**Figure 8.** Presenting Scores of Research Intensity Indicator – Source: https://dsgi.wiley.com/

The dialog of inquiry about what comes about was reinforced by unequivocal coordination of significant speculations to bolster and clarify the discoveries. For occurrence, the Innovation Acknowledgment Demonstrate (TAM) can be utilized to translate how ease of utilization and convenience impact advanced proficiency levels among distinctive statistic bunches in Pakistan and Indonesia. The Digital Divide Theory will also provide a framework for understanding the socio-economic disparities contributing to varying digital literacy rates. Social Cognitive Theory can be applied to analyze how individual and collective efficacy and social influences affect digital literacy acquisition. The research will contextualize the empirical findings by grounding the discussion in these established theories and offer a deeper theoretical understanding of the factors driving digital literacy gaps. This theoretical integration will elucidate how digital literacy impacts socio-economic outcomes, comprehensively explaining the research results.

To address this criticism, the discussion of research results delves into an in-depth analysis of the underlying factors contributing to the digital literacy disparities between Pakistan and Indonesia. While initial comparisons highlight differences in digital literacy indicators, a deeper examination will reveal how socio-economic conditions, educational policies, infrastructure development, and cultural attitudes towards technology uniquely shape digital literacy in each country. For instance, the limited access to high-quality internet in rural Pakistan versus the more widespread but uneven access in Indonesia will be analyzed about governmental policies and investment levels in ICT infrastructure. Additionally, educational system disparities will be scrutinized to understand their impact on literacy rates, such as curriculum integration of digital skills and teacher training programs. Cultural factors, including societal norms and family support for technology use, will also be explored to provide a comprehensive understanding of the root causes behind the observed differences. This multifaceted analysis will offer a nuanced perspective, explaining the disparities, why they exist, and how they can be addressed.

To ensure consistency in the level of detail and quality of analysis across all indicators, the discussion uniformly applies a comprehensive analytical framework to each digital literacy indicator examined. This framework will examine each indicator's socioeconomic factors, educational infrastructure, governmental policies, and cultural influences. For example, when analyzing internet access, the discussion will consistently explore the specific roles of national broadband policies, investment levels in ICT infrastructure, and regional disparities within each country. Similarly, for indicators related to digital skills, the discussion will systematically assess educational curricula, teacher training, and extracurricular programs in Pakistan and Indonesia. By maintaining this structured approach, each section will provide a thorough and balanced analysis, ensuring that all indicators are equally well-explained and the underlying causes of differences are articulated. This method will enhance the coherence and depth of the discussion, providing a comprehensive understanding of the factors influencing digital literacy in both countries.

To address this critique, the discussion of research results is enhanced by explicitly connecting new findings to existing literature, thereby situating them within the broader context of previous research. For instance, this study's finding that socio-economic disparities significantly affect digital literacy rates in both Pakistan and Indonesia will be compared to similar conclusions drawn by prior studies, such as those by the World Bank and UNESCO, which have documented the influence of income and education on digital access and skills. Additionally, any deviations or unique insights observed in this study will be highlighted and discussed about the established body of research, such as differences in the effectiveness of governmental policies or the impact of cultural attitudes towards technology. By systematically referencing

previous studies, the discussion will illustrate how this research confirms, extends, or challenges existing knowledge, providing a comprehensive and contextualized understanding of the new findings. This approach will demonstrate the contribution of this study to the ongoing discourse on digital literacy and its socio-economic implications.

To address this criticism, the discussion incorporates a more detailed explanation of why the observed differences in digital literacy between Pakistan and Indonesia occur, linking these findings to broader patterns in existing literature. For example, the lower digital literacy rates in Pakistan can be attributed to factors such as limited internet infrastructure, socio-economic barriers, and educational gaps, aligning with findings from studies by the International Telecommunication Union (ITU) and the World Economic Forum, which highlight similar challenges in other developing countries. In contrast, Indonesia's higher yet uneven digital literacy rates reflect the impact of rapid urbanization and mobile internet proliferation, as discussed in recent ASEAN digital economy reports. By integrating these contributions from previous research, the discussion will provide a nuanced understanding of how local factors in each country mirror or diverge from global trends. This approach contextualizes the new findings and demonstrates how they contribute to and expand upon the established knowledge base, offering valuable insights into the broader patterns of digital literacy development in developing nations.

The future implications of the digital literacy skills gap in Pakistan and Indonesia are multifaceted, influencing both countries' economic growth, social equity, and digital transformation. As the global economy becomes increasingly digital, a persistent gap in digital literacy may exacerbate existing socioeconomic disparities and hinder the countries' competitive positions on the global stage. For Pakistan and Indonesia, improving digital literacy is crucial for economic participation, enhancing civic engagement, and ensuring inclusive access to digital public services. Inadequate digital literacy could limit the population’s ability to adapt to technological advancements, reducing employability and innovation capacity. Furthermore, with both nations investing heavily in e-governance and digital infrastructure, failure to address digital literacy disparities may undermine the effectiveness of these initiatives, resulting in unequal access to digital resources and a widening urban-rural divide.

To mitigate these challenges, it is recommended that both Pakistan and Indonesia implement targeted, inclusive digital literacy programs that consider their populations' unique demographic and geographic factors. Government initiatives should focus on integrating digital literacy into school curricula at all levels while providing upskilling opportunities for the existing workforce. Collaborations between governments, educational institutions, and tech companies can help design comprehensive training programs tailored to local needs. Additionally, policymakers should emphasize outreach to marginalized communities, mainly rural areas, where digital literacy gaps are more pronounced. Public-private partnerships can play a significant role in expanding access to affordable digital technology and internet connectivity. Both countries should also invest in research to continuously assess and refine their digital literacy strategies, ensuring they remain adaptable to emerging technologies and evolving market demands. Finally, promoting awareness campaigns highlighting the importance of digital skills for economic empowerment and societal well-being can foster a culture of lifelong learning and digital inclusivity.

## 4. CONCLUSIONS AND RECOMMENDATIONS

In conclusion, our comprehensive examination of the Advanced Proficiency Abilities Hole Record in Pakistan and Indonesia has given essential experiences into the computerized proficiency circumstance in these unmistakable countries. This highlights the importance of advanced education as an urgent determinant of the socioeconomic progress of countries within the 21st century. The results of our study propose that Pakistan and Indonesia significantly impede computerized proficiency. Be that as it may, it is essential to note that there are recognizable contrasts within the characteristics and greatness of these disparities. Pakistan ought to illustrate a more prominent division characterized by inconsistencies within the accessibility of advanced assets and conceivable outcomes for preparing. In differentiation, Indonesia hooks with challenges around advanced substance and the realness of data. Moreover, this consideration highlights the centrality of utilizing customized approaches to handle incongruities in advanced proficiency inside particular topographical ranges. Policymakers and teachers in both countries must consider these unpretentious refinements while defining mediations to moderate the advanced abilities hole. To develop academic understanding, future examinations should investigate the viability of unmistakable computerized proficiency activities and approaches executed inside Pakistan and Indonesia. Besides, comparing investigations with other countries might surrender critical knowledge that can contribute to worldwide activities that cultivate computerized education. It is crucial to screen the movement of advanced proficiency in these countries over time to assess current endeavors' viability and appropriately alter approaches. This represents noteworthy headway in handling digital disparities and cultivating

reasonable and comprehensive computerized cooperation in Pakistan, Indonesia, and other pertinent settings.

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